WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

Form #3

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Aug 15 3 51 PM '94

OFFICE OF WEST VIRGIN
SECRETARY OF STATE

NOTICE OF AGENCY APPROVAL OF A PROPOSED RULE
AND
FILING WITH THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

AGENCY: West Virginia Division of Environmental Protection
Office of Air Quality TITLE NUMBER: 45CSR37

CITE AUTHORITY West Virginia Code 22-5-1 et seq.

AMENDMENT TO AN EXISTING RULE: YES___ NO X

IF YES, SERIES NUMBER OF RULE BEING AMENDED: _____

TITLE OF RULE BEING AMENDED: _____

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: 45CSR37

TITLE OF RULE BEING PROPOSED: "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"

THE ABOVE PROPOSED LEGISLATIVE RULE HAVING GONE TO A PUBLIC HEARING OR A PUBLIC COMMENT PERIOD IS HEREBY APPROVED BY THE PROMULGATING AGENCY FOR FILING WITH THE SECRETARY OF STATE AND THE LEGISLATIVE RULE MAKING REVIEW COMMITTEE FOR THEIR REVIEW.

Roger F Wall
Authorized Signature

Expired at the end of 1995 Legislative Session failed to pass the Legislature 3/13/95

24-90

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: 45CSR37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County

Type of Rule: ___X___ Legislative _____ Interpretive _____ Procedural

Agency: Office of Air Quality

Address: 1558 Washington Street, East

Charleston, WV 25311-2599

1. Effect of Proposed Rule	Annual		Fiscal Year		
	Increase	Decrease	Current	Next	There-after
Estimated Total Cost	$ -0-	$ -0-	$ -0-	$ -0-	$ -0-
Personal Services	-0-	-0-	-0-	-0-	-0-
Current Expense	-0-	-0-	-0-	-0-	-0-
Repairs and Alterations	-0-	-0-	-0-	-0-	-0-
Equipment	-0-	-0-	-0-	-0-	-0-
Other	-0-	-0-	-0-	-0-	-0-

2. Explanation of above estimates:

Costs incurred are covered under the budget estimates for implementing the Clean Air Act, as amended, under 45CSR30, promulgated by the Legislature during the 1994 Session.

3. Objectives of these rules:

This rule establishes emission standards, compliance determination methods and other requirements for the control of sulfur dioxide emissions from sources of such emissions in Hancock County. The intent of the rule is to achieve attainment of the national and state ambient air quality standards for sulfur dioxide in the Hancock County area and to subsequently maintain such attainment.

4. Explanation of overall economic impact of proposed rule.

A. Economic impact on state government.

Rule implementation should have minimal impact on state government. Cost of enforcement of this rule is included in prior estimates for implementing Title V permits under 45CSR30.

B. Economic impact on political subdivisions; specific industries; specific groups of citizens.

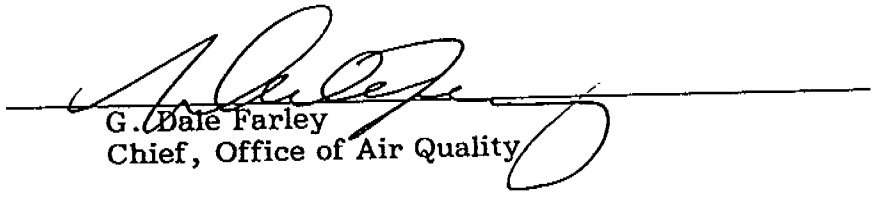
This rule could have substantial economic impact upon two industrial facilities in Hancock County: Weirton Steel Corporation and Quaker State Oil Refining Corporation. Additional fuel costs to modify exhaust stacks and costs to install and maintain emissions monitoring equipment would be incurred by these companies.

C. Economic impact on citizens/public at large.

This rule should have minimal impact upon the citizens and public at large.

Date: July 6, 1994

Signature of agency head or authorized representative:



G. Dale Farley
Chief, Office of Air Quality

DATE: August 15, 1994

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM: G. DALE FARLEY
CHIEF, OFFICE OF AIR QUALITY
DIVISION OF ENVIRONMENTAL PROTECTION

LEGISLATIVE RULE TITLE: Series 37 - "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"

1. Authorizing statute(s) citation W. Va. Code §§22-5-1 et seq.

2. a. Date filed in State Register with Notice of Hearing:

July 6, 1994

b. What other notice, including advertising, did you give of the hearing?

Class I legal advertisement filed in a newspaper published in each of the Air Quality Control Regions of West Virginia.

Office of Air Quality mailing list.

c. Date of hearing(s): August 9, 1994

d. Attach list of persons who appeared at hearing, comments received, amendments, reasons for amendments.

Attached X No comments received

e. Date you filed in State Register the agency approved proposed Legislative Rule following public hearing: (be exact)

August 15, 1994

f. Name and phone number of agency person to contact for additional information:

G. Dale Farley, Chief

Office of Air Quality (Phone: 558-2275)

DIVISION OF ENVIRONMENTAL PROTECTION

GASTON CAPERTON
GOVERNOR

10 McJunkin Road
Nitro, WV 25143-2506

DAVID C. CALLAGHAN
DIRECTOR

August 9, 1994

Ms. Judy Cooper
Director, Administrative Law Division
Secretary of State's Office
Building 1, Suite 157K
Charleston, West Virginia 25305

RE: CSR-45-37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County

Dear Ms. Cooper:

This is to advise you that I am giving approval for the filing of the above-captioned rule with your Office and with Legislative Rule-Making Review Committee as an agency-approved rule.

Your cooperation in this regard is very much appreciated. If you have any questions or require additional information, please feel free to contact Roger T. Hall at 759-0515.

Sincerely yours,

David C. Callaghan
Commissioner
Bureau of Environment

DCC;RTH:cc

Attachment

WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

Form #1

FILED

JUL 6 4 36 PM '94

OFFICE OF WEST VIRGINIA SECRETARY OF STATE

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: West Virginia Division of Environmental Protection Office of Air Qualtiy TITLE NUMBER: 45CSR37

RULE TYPE: Legislative ; CITE AUTHORITY W. Va. Code §§22-5-1 et seq.

AMENDMENT TO AN EXISTING RULE: YES___ NO X

IF YES, SERIES NUMBER OF RULE BEING AMENDED: _____

TITLE OF RULE BEING AMENDED: _____

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: 45CSR37

TITLE OF RULE BEING PROPOSED: "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"

DATE OF PUBLIC HEARING: August 9, 1994 TIME: 9:00 a.m.

LOCATION OF PUBLIC HEARING: Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

RECEIVED
JUL 07 1994
Legislative Rule Making Review Committee

COMMENTS LIMITED TO: ORAL___, WRITTEN___, BOTH X

COMMENTS MAY ALSO BE MAILED TO THE FOLLOWING ADDRESS: Same as above.

The Department requests that persons wishing to make comments at the hearing make an effort to submit written comments in order to facilitate the review of these comments.

The issues to be heard shall be limited to the proposed rule.

ATTACH A **BRIEF** SUMMARY OF YOUR PROPOSAL

45CSR37

PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY

SUMMARY

This rule establishes emission standards, compliance determination methods and other requirements for the control of sulfur dioxide emissions and ambient concentrations of sulfur dioxide associated with sources of such emissions in Hancock County. The intent of the rule is to achieve attainment of the national and state ambient air quality standards for sulfur dioxide in the Hancock County area and to subsequently maintain such attainment.

45CSR37

PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY

STATEMENT OF CIRCUMSTANCE

The purpose of this rule is to achieve attainment of the national and state ambient air quality standards for sulfur dioxide in the Hancock County area and to subsequently maintain such attainment. The national and state ambient air quality standards are being seriously violated under current regulatory provisions.

45CSR37

TITLE 45
LEGISLATIVE RULES
BUREAU OF ENVIRONMENT
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY

SERIES 37
PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY

§45-37-1. General.

1.1. Scope. -- This rule establishes emission standards, compliance determination methods and other requirements for the control of sulfur dioxide emissions from sources of such emissions in Hancock County. The intent of the rule is to achieve attainment of the national and state ambient air quality standards for sulfur dioxide in the Hancock County area and to subsequently maintain such attainment.

1.2. Authority. -- W. Va. Code §22-5-1 et seq.

1.3. Filing Date. --

1.4. Effective Date. --

1.5. Incorporation by Reference -- Federal Counterpart Regulation. Emission monitoring, emission test procedures and criteria, and related recordkeeping and reporting requirements promulgated by USEPA in 40 CFR Part 60 are adopted by reference. The emission standards and other provisions of this rule are intended to bring about attainment with the national and state ambient air quality standards and have no federal counterpart for inclusion.

1.6. Determination of Stringency -- Federal Counterpart Regulation. The Director has determined that this rule is necessary to achieve attainment of the national and state ambient air quality standards for sulfur dioxide established pursuant to the Federal Clean Air Act, as amended. There are no counterpart federal emission standards, facility design or other facility operating requirements for this purpose.

1.7. Constitutional Takings Determination -- The Director has determined that this rule will not result in a constitutional taking of real property.

§45-37-2. Definitions.

2.1. "Coal" means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by the American Society of Testing and Materials, Designation D388-77.

2.2. "Construction" means fabrication, erection, or installation of an emissions source or facility subject to this rule.

2.3. "Continuous monitoring system" means the total equipment, required to sample and condition (if applicable), to analyze and to provide a permanent record of emissions or process parameters.

2.4. "Director" means the Director of the Division of Environmental Protection or his or her designated representative.

2.5. "Discharge" means the release or emission of air pollutants into the air.

2.6 "Division of Environmental Protection", 'DEP' means the Division of Environmental Protection as defined in W. Va. Code §§22-1-1 et seq.

2.7. "Enforceable" means enforceable by the Director and the United States Environmental Protection Agency (USEPA).

2.8. "Excess emissions" means any sulfur dioxide emission rate or concentration exceeding an emission standard in section 4 of this rule.

2.9. "Excess Emissions and Monitoring Systems performance report" means a report that must be submitted periodically by the owner or operator of a source in order to provide data on its compliance with stated emission limits and operating parameters, and on the performance of its monitoring systems.

2.10. "Flare" means and includes a combustion source normally comprised of but not limited to a length of stack or pipe which has an attached burner mechanism designed to destroy liquid or gaseous material with an open or semi-enclosed flame.

2.11. "Heat input" means heat derived from combustion of fuel in a boiler, process heater, or other fuel combustion device and does not include the heat input from preheated combustion air, recirculated flue gases, or exhaust gases from other sources, such as gas turbines, internal combustion engines, kilns, etc.

2.12. "Incinerator" means any device or furnace designed to destroy combustible refuse.

2.13. "Malfunction" means any sudden and unavoidable failure of air pollution control equipment or process equipment or of a process to operate in a normal or usual manner. Failures that are caused entirely or in part by poor maintenance, careless operation, or any other preventable upset condition or preventable equipment breakdown shall not be considered malfunctions.

2.14. "Modification" means for the purpose of this rule, any physical change or change in the method of operation of any sulfur dioxide emission source subject to this rule which results in or may result in an increase of 2 pounds per hour or 5 tons per year or more of sulfur dioxide.

2.15. "Owner or Operator" means any person who owns, leases, operates, controls, or supervises a source subject to air pollutant emission standards.

2.16. "Person" means any and all persons, natural or artificial, including the State of West Virginia or any other state and all agencies or divisions thereof, any state political subdivision, the United States of America, any municipal, public, statutory, or private corporation or association organized or existing under the laws of this or any other state or country, and any firm, partnership, or association of whatever nature.

2.17. "Process unit" means any source of sulfur dioxide emission other than boilers, process heaters, incinerators, or flares associated with any manufacturing process.

2.18. "Refinery fuel gas" means any gas which is generated at a petroleum refinery and which is combusted.

2.19. "Refuse" means the useless and/or unwanted or discarded solid, liquid and/or gaseous waste materials resulting from community, commercial, industrial or citizen activities.

2.20. "Run" means the net period of time during which sufficient emission samples are collected to characterize a three hour period in accordance with the applicable emission test procedure.

2.21. "Shut-down" means the cessation of a facility subject to this rule for any purpose.

2.22. "State Implementation Plan", 'SIP' means a State Implementation Plan approved by USEPA which provides for implementation, maintenance, and enforcement of national ambient air quality standards for each state (or portion thereof).

2.23. "Stack" means, for the purpose of this rule, but is not limited to, any duct, control equipment exhaust, or similar apparatus, which vents gases and/or particulate matter into the open air.

2.24. "Start-up" means the setting in operation of a facility subject to this rule for any purpose.

2.25. "Sulfur dioxide" means an air pollutant which is a nonflammable, nonexplosive, colorless, gaseous molecule composed of one (1) atom of sulfur and two (2) atoms of oxygen. In concentrations of 0.3 to 1.0 parts per million and above, most people can detect it by taste; in concentrations greater than 3.0 parts per million it has a pungent, irritating odor to most people.

2.26. "USEPA" means the United States Environmental Protection Agency.

§45-37-3. Requirements.

3.1. No person shall operate any source of sulfur dioxide emissions subject to the emissions standards or other provisions of this rule unless such source is in compliance with the provisions of this rule. No person shall construct or modify or cause to be constructed or modified any source subject to the requirements of this rule without first obtaining a permit for such construction or modification in accordance with all applicable permitting rules enforced by the Director.

3.2. At all times, including periods of start-up, shut-down, and malfunction, owners and operators shall, to the extent practicable, maintain and operate all sources of sulfur dioxide emissions subject to this rule including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Director which may include, but is not limited to, monitoring results, review of operating and maintenance procedures, and inspection of the source.

§45-37-4. Sulfur Dioxide Emission Standards.

4.1. The following sulfur dioxide emission limitations or operating limitations shall apply to the listed emission sources owned and operated by Weirton Steel Corporation or its assigns or successors at Weirton, West Virginia:

a. High pressure boilers No. 1, 2, 3, and 4:

A. 1.2 pounds of sulfur dioxide per million Btu of heat input when coal or a combination of coal with fuel oil or gas is fired.

B. 0.6 pounds of sulfur dioxide per million Btu of heat input when fuel oil or a combination of fuel oil and gas is fired.

b. Low pressure boilers No. 1 and 2, basic oxygen furnace waste heat boilers, reheat furnaces No. 1 and 2, and high pressure boiler No. 5:

A. 0.6 pounds of sulfur dioxide per million Btu of heat input when firing fuel oil or a combination of fuel oil and gas.

c. Sinter plant: 120 pounds of sulfur dioxide per hour.

d. Slag granulator: 32 pounds of sulfur dioxide per hour.

e. Blast furnace gas or natural gas shall be the only fuels fired in low pressure boiler No. 15, the two Foster Wheeler boilers and combustion sources at the hydrochloric acid regeneration plant, continuous annealing facility, jumbo annealing facility, detinning facility, galvanizing facility, and blast furnace stoves.

4.2. The following sulfur dioxide emission or operating limitations shall apply to the listed emission sources owned and operated by Quaker State Corporation or its assigns or successors at its Congo refinery:

a. Fluidized-bed boilers No. 1 and 2: 1.2 pounds of sulfur dioxide per million Btu of heat input.

b. Fuel-oil fired boilers A and B: 0.38 pounds of sulfur dioxide per million Btu of heat input when firing fuel oil or fuel oil in combination with natural or refinery gas.

c. No refinery fuel gas or other process gas stream, except as provided by subsection 4.2.g, shall be fired in any combustion device, including but not limited to, boilers, process heaters, incinerators, and flares, which contains greater than 50 grains of hydrogen sulfide per one hundred (100) dry standard cubic feet of gas.

d. The Isomax unit heater, designated as H-605 shall fire only natural gas. The vacuum fractionator heater, designated as H-701, shall fire only refinery fuel gas or natural gas.

e. Except as otherwise provided in this section, any process heater in which fuel oil is fired shall comply with an emission limitation of 1.1 pounds of sulfur dioxide per million Btu's of heat input when firing fuel oil or a combination of fuel oil and refinery fuel gas or natural gas.

f. Process heaters H-101, H-501/6, and H-601/4: not more than two of these process heaters shall be fired with fuel oil concurrently.

g. All gases routed to the sour gas flare shall be treated by the plant desulfurization system and sulfur dioxide emissions from the sour gas flare shall not exceed eighteen (18) pounds per hour.

4.3. Notwithstanding the emission control requirements of any other rule, no boiler, process heater, incinerator, or flare with a design heat input greater than 3 million Btu per hour shall be operated by any person within Hancock County unless such fuel burning unit or combustion device complies with an emission limitation which does not exceed 0.6 pounds of sulfur dioxide per million Btu of heat input.

4.4. Notwithstanding the emission control requirements of any other rule, no process unit shall be operated by any person within Hancock County unless all exhaust gas streams from such process unit comply with sulfur dioxide concentration limits which do not exceed 50 parts per million by volume.

§45-37-5. Compliance Testing and Monitoring Requirements.

5.1. Except as provided under subsection 5.1.d, continuous emission monitoring systems shall be installed, calibrated, maintained and operated to measure sulfur dioxide emissions and either oxygen or carbon dioxide concentrations in the exhaust gases from the following fuel burning equipment or process units:

a. At the Weirton integrated steel production plant operated by Weirton Steel Corporation or its assigns or successors:

A. High pressure boilers Nos. 1, 2, 3 and 4

B. Low pressure boilers Nos. 1 and 2

C. BOF waste heater boiler

D. Reheat furnaces Nos. 1 and 2

E. Sinter Plant

b. At the Congo refinery operated by Quaker State Corporation or its assigns or successors:

A. Fluidized-bed boilers Nos. 1 and 2

B. Fuel oil-fired boilers A and B

c. Installation, calibration, maintenance and operation of the continuous emission monitoring systems required under subsection 5.1.a and 5.1.b shall comply with the following provisions under 40 CFR Part 60 which are adopted by reference:

A. Part 60.13(a)
B. Part 60.13(c)
C. Part 60.13(d)(1)
D. Part 60.13(e)(2)
E. Part 60.13(f)
F. Part 60.13(g)
G. Part 60.13(h)
H. Part 60.13(i)
I. Part 60.13(j)
J. Part 60.45(c)
K. Part 60.45(e)
L. Part 60.45(f)
M. Part 60.46(b)(4)
N. Part 60, Appendix A, Methods 6, 6A, and 6B
O. Part 60, Appendix B, Performance Specification 2
P. Part 60, Appendix B, Performance Specification 3

Where the term "Administrator" (USEPA) is used within any of the adopted 40 CFR Part 60 provisions the term shall mean the Director.

d. Either Weirton Steel Corporation or Quaker State Corporation may petition the Director for approval of a program to monitor daily fuel oil usage and fuel oil sulfur content in lieu of otherwise meeting the requirements of subsection 5.1 for boilers or fuel burning equipment that burn only fuel oil or fuel oil and gas. This provision shall not relieve either company of the requirement to comply with subsections 4.2.c and 5.2 of this rule if applicable.

5.2. A continuous emission monitoring system(s) shall be installed, calibrated, maintained, and operated to measure the concentration of hydrogen sulfide in all refinery fuel gas streams at the Congo refinery operated by Quaker State Corporation or its assigns or successors. Installation, calibration, maintenance, and operation of this continuous emission monitoring system shall comply with the following provisions of 40 CFR Part 60 which are adopted by reference:

a. Part 60.13(a)
b. Part 60.13(c)
c. Part 60.13(d)(1)
d. Part 60.13(e)(2)
e. Part 60.13(f)
f. Part 60.13(g)
g. Part 60.13(h)
h. Part 60.13(i)
i. Part 60.13(j)
j. Part 60.105(a)(4)
k. Part 60.106(e) Part 60, Appendix A, Method 11
l. Part 60, Appendix B Performance Specification 7

The Director may approve the installation of sulfur dioxide and oxygen monitoring systems to monitor sulfur dioxide emissions in the exhaust gases from combustion units firing refinery fuel gas in lieu of a hydrogen sulfide monitoring systems for the fuel gas streams. Such sulfur dioxide and oxygen monitoring systems shall be subject to the performance specifications, quality assurance procedures and other related requirements under 40 CFR Part 60.

5.3. All data required to be collected under subsections 5.1 and 5.2 shall be quality assured in accordance with 40 CFR Part 60, Appendix F Quality Assurance Procedures which is adopted herein by reference.

5.4. The Director may require any person subject to this rule to install, calibrate, maintain and operate continuous emission monitoring equipment in accordance with provisions of 40 CFR Part 60 adopted by reference in subsections 5.1 and 5.2.

5.5. Sources of sulfur dioxide subject to this rule shall demonstrate compliance with the emission standards under Section 4 using data collected in accordance with subsections 5.1., 5.2. and 5.4. and reference emissions test procedures in 40 CFR Part 60, Appendix A, Methods 6, 6A, 6B, and 19. In addition to the emissions data collected pursuant to this sub-section, the Director may use any other credible evidence in determining compliance with this rule.

5.6. Compliance with this rule shall be based upon a three-hour rolling average determination of the sulfur dioxide emissions rate or concentration (or hydrogen sulfide concentration) where continuous emissions monitoring data is used to determine compliance. Any source of sulfur dioxide emissions not subject to continuous monitoring requirements must demonstrate compliance in accordance with

subsection 5.5 not less frequently than semi-annually (six month intervals or more frequently). At least three test runs, each with sufficient samples to characterize a three hour period representative of normal source operation, shall be required for each compliance demonstration using the reference test procedures specified in subsection 5.5. The Director may order any person subject to this rule to conduct or have conducted an emissions test at any time that he or she has reason to believe that an emission limitation may be exceeded. The semi-annual tests shall otherwise be scheduled as ordered by or in consultation with the Director.

5.7. Any person subject to this rule and to the requirement of demonstrating compliance using a reference test method under 40 CFR Part 60, Appendix A shall be required to submit a test protocol to the Director for approval at least thirty (30) days prior to the projected test dates. The Director shall be provided written notice of the actual test dates after approval of the test protocol but not less than fifteen (15) days prior to the first date of testing.

5.8. Should the Director exercise his option to conduct emissions tests or monitoring, the owner or operator of a source of sulfur dioxide emissions subject to this rule shall provide all necessary sampling connections and sampling ports to be located in such a manner as the Director may require, power for test equipment, safe sampling platforms and safe access to such sampling platforms.

§45-37-6. Recordkeeping and Reporting Requirements.

6.1. Any person subject to continuous monitoring requirements under subsection 5.1, 5.2, or 5.4 of this rule shall provide written notice to the Director at least thirty (30) days prior to any performance demonstration of the continuous monitoring system or device.

6.2. Each owner or operator required to install a continuous monitoring system or monitoring device shall submit an excess emissions and monitoring systems performance report to the Director quarterly unless the Director determines that monthly reports are required in which case he or she shall provide written notice of such requirements or shall include such a requirement in a construction permit or operating permit. All such reports shall be post-marked by the thirtieth day following the end of each calendar quarter or fifteenth day following each calendar month for monthly reports. Written reports of excess emissions shall include the following information:

a. The magnitude of excess emissions computed in accordance with 40 CFR §60.13(h), any conversion factor(s) used, the date and the time at which the excess emissions started and ended for each occurrence of excess emissions, and the process operating time during the reporting period.

b. Specific identification of each period of excess emissions that occurs during start-ups, shut-downs, and malfunctions of the affected facility. Each malfunction report filed with the Director in accordance with subsection 6.6 shall be referenced by report number with the date of occurrence and date of report submission noted.

c. The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.

d. When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

If the total duration of excess emissions during the reporting period is less than 1 percent of the total operating time for the reporting period and downtime for the continuous monitoring system for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form listed as Figure 1 in 40 CFR 60.7(d) shall be submitted and the excess emission report described above need not be submitted unless requested by the Director. If the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total continuous system downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and the excess emission report described above shall both be submitted to the Director.

6.3. Any owner or operator subject to this rule shall maintain records of the occurrence and duration of any start-up, shut-down or malfunction in the operation of sources subject to this rule, any malfunction of air pollution control equipment, or any periods during which a continuous monitoring system or device is inoperative. These records shall be retained for at least five (5) years following the date of such measurements, maintenance, reports, and records and shall be made available to the Director upon request or during any facility inspection.

6.4. Any owner or operator subject to the provisions of this part shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by this part recorded in a permanent form suitable for inspection. The file shall be retained for at least five (5) years following the date of such measurements, maintenance, reports, and records and shall be made available to the Director upon request or during any facility inspection.

6.5. Any report of an emissions test conducted by or for an owner or operator pursuant to subsection 5.5 and 5.6 shall be completed, certified and submitted to the Director within thirty (30) days of the final sampling date for the test.

6.6. The owner or operator of a source of sulfur dioxide emissions subject to this rule shall report to the Director, by telephone or telefax, any malfunction of such source or its air pollution control equipment which results in any excess sulfur dioxide emission rate or concentration within twenty-four (24) hours of becoming aware of such condition. The owner or operator shall file a certified written report

concerning the malfunction with the Director within ten (10) days providing the following information:

a. A detailed explanation of the factors involved or causes of the malfunction.

b. The date and time of duration (with starting and ending times) of the period of excess emissions.

c. An estimate of the mass of excess emissions discharged during the malfunction period.

d. The maximum emission rate or concentration measured or otherwise determined during the malfunction in units of the applicable emissions standard.

e. Immediate remedial actions taken at the time of the malfunction to correct or mitigate the effects of the malfunction.

f. A detailed explanation of the corrective measures or program that will be implemented to prevent a recurrence of the malfunction and a schedule for such implementation.

§45-37-7 Circumvention.

7.1. No owner or operator subject to the provisions of this rule shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.

§45-37-8. Stack Height Requirements.

8.1. Except as provided in Section 8.3, all exhaust gases from high pressure boilers 1, 2, 3, and 4 at Weirton Steel Corporation's (or its assigns or successors) Weirton integrated steel production plant shall be discharged to the air from a stack(s) with good engineering practice stack height(s) calculated in accordance with paragraph 2.4.b of 45CSR20.

8.2. Except as provided in subsection 8.3, all exhaust gases from fluidized-bed boilers Nos. 1 and 2 and fuel oil-fired boilers A and B at Quaker State Corporation (or its assigns or successors) shall be discharged to the air from a stack(s) with a height(s) of 65 meters above ground level elevation at the base of the stack(s).

8.3. The Director may relieve Weirton Steel Corporation or Quaker State Corporation (or assigns or successors to either company) from the requirement to comply with sub-section 8.1 or 8.2 pursuant to a demonstration by either company,

approved by the Director and USEPA, assuring attainment of the ambient air quality standards for sulfur dioxide under the emission and operating limitations set forth in section 4 or upon formal approval and incorporation into the State Implementation Plan of alternative emission or operating limitations in accordance with an approved attainment demonstration.

§45-37-9. Compliance Programs and Schedules.

9.1. In the event that a source(s) of sulfur dioxide emissions in existence on the effective date of this rule cannot comply with the requirements of this rule, an acceptable program to fully comply shall be developed and submitted to the Director by the owner or operator of the source(s). This program shall be submitted to the Director within sixty (60) days of the effective date of this rule and shall provide for compliance to be achieved as expeditiously as practicable but not later than twelve (12) months from the effective date of this rule.

9.2. In the event that an owner or operator of such source(s) of sulfur dioxide emissions fails to submit an acceptable program and schedule, the Director shall, by order determine the compliance program and schedule.

§45-37-10. Relationship to Other Rules.

10.1. The provisions of this rule shall supersede the provisions of 45CSR10 with respect to sources of sulfur dioxide emissions in Hancock County. In the event of any inconsistency in this rule and any other rule of the West Virginia Division of Environmental Protection, such inconsistency shall be resolved by the determination of the Director and such determination shall be based upon the application of the more stringent provision, term, condition, method, rule or regulation.

§45-37-11. Severability.

11.1. The provisions of this rule are severable and if any provisions or part thereof shall be held invalid, unconstitutional, or inapplicable to any person or circumstance; such invalidity, unconstitutionality, or inapplicability shall not affect or impair any of the remaining provisions, sections, or parts of this rule; or their application to any persons or circumstances.

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tion) or modification or the commencement thereof within the meaning of this part.

(b) The Administrator will respond to any request for a determination under paragraph (a) of this section within 30 days of receipt of such request.

[40 FR 58418, Dec. 16, 1975]

§ 60.6 Review of plans.

(a) When requested to do so by an owner or operator, the Administrator will review plans for construction or modification for the purpose of providing technical advice to the owner or operator.

(b)(1) A separate request shall be submitted for each construction or modification project.

(2) Each request shall identify the location of such project, and be accompanied by technical information describing the proposed nature, size, design, and method of operation of each affected facility involved in such project, including information on any equipment to be used for measurement or control of emissions.

(c) Neither a request for plans review nor advice furnished by the Administrator in response to such request shall (1) relieve an owner or operator of legal responsibility for compliance with any provision of this part or of any applicable State or local requirement, or (2) prevent the Administrator from implementing or enforcing any provision of this part or taking any other action authorized by the Act.

[36 FR 24877, Dec. 23, 1971, as amended at 39 FR 9314, Mar. 8, 1974]

§ 60.7 Notification and record keeping.

(a) Any owner or operator subject to the provisions of this part shall furnish the Administrator written notification as follows:

(1) A notification of the date construction (or reconstruction as defined under § 60.15) of an affected facility is commenced postmarked no later than 30 days after such date. This requirement shall not apply in the case of mass-produced facilities which are purchased in completed form.

(2) A notification of the anticipated date of initial startup of an affected facility postmarked not more than 60 days nor less than 30 days prior to such date.

(3) A notification of the actual date of initial startup of an affected facility postmarked within 15 days after such date.

(4) A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in § 60.14(e). This notice shall be postmarked 60 days or as soon as practicable before the change is commenced and shall include information describing the precise nature of the change, present and proposed emission control systems, productive capacity of the facility before and after the change, and the expected completion date of the change. The Administrator may request additional relevant information subsequent to this notice.

(5) A notification of the date upon which demonstration of the continuous monitoring system performance commences in accordance with § 60.13(c). Notification shall be postmarked not less than 30 days prior to such date.

(6) A notification of the anticipated date for conducting the opacity observations required by § 60.11(e)(1) of this part. The notification shall also include, if appropriate, a request for the Administrator to provide a visible emissions reader during a performance test. The notification shall be postmarked not less than 30 days prior to such date.

(7) A notification that continuous opacity monitoring system data results will be used to determine compliance with the applicable opacity standard during a performance test required by § 60.8 in lieu of Method 9 observation data as allowed by § 60.11(e)(5) of this part. This notification shall be postmarked not less than 30 days prior to the date of the performance test.

(b) Any owner or operator subject to the provisions of this part shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of an affected facility; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.

(c) Each owner or operator required to install a continuous monitoring system (CMS) or monitoring device shall submit an excess emissions and monitoring systems performance report (excess emissions are defined in applicable subparts) and/or a summary report form (see paragraph (d) of this section) to the Administrator semiannually, except when: more frequent reporting is specifically required by an applicable subpart; or the CMS data are to be used directly for compliance determination, in which case quarterly reports shall be submitted; or the Administrator, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. All reports shall be postmarked by the 30th day following the end of each calendar half (or quarter, as appropriate). Written reports of excess emissions shall include the following information:

(1) The magnitude of excess emissions computed in accordance with § 60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions. The process operating time during the reporting period.

(2) Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the affected facility. The nature and cause of any malfunction (if known), the corrective action taken or preventative measures adopted.

(3) The date and time identifying each period during which the continuous monitoring system was inoperative except for zero and span checks and the nature of the system repairs or adjustments.

(4) When no excess emissions have occurred or the continuous monitoring system(s) have not been inoperative, repaired, or adjusted, such information shall be stated in the report.

(d) The summary report form shall contain the information and be in the format shown in figure 1 unless otherwise specified by the Administrator. One summary report form shall be submitted for each pollutant monitored at each affected facility.

(1) If the total duration of excess emissions for the reporting period is less than 1 percent of the total operating time for the reporting period and CMS downtime for the reporting period is less than 5 percent of the total operating time for the reporting period, only the summary report form shall be submitted and the excess emission report described in § 60.7(c) need not be submitted unless requested by the Administrator.

(2) If the total duration of excess emissions for the reporting period is 1 percent or greater of the total operating time for the reporting period or the total CMS downtime for the reporting period is 5 percent or greater of the total operating time for the reporting period, the summary report form and the excess emission report described in § 60.7(c) shall both be submitted.

FIGURE 1—SUMMARY REPORT—GASEOUS AND OPACITY EXCESS EMISSION AND MONITORING SYSTEM PERFORMANCE

Pollutant (Circle One—SO_2/NO_x/TRS/H_2S/CO/Opacity)
Reporting period dates: From _____ to _____
Company:
Emission Limitation _____
Address:
Monitor Manufacturer and Model No. _____
Date of Latest CMS Certification or Audit _____
Process Unit(s) Description:
Total source operating time in reporting period [1] _____

Emission data summary [1]	CMS performance summary [1]
1. Duration of excess emissions in reporting period due to:	1. CMS downtime in reporting period due to:
a. Startup/shutdown	a. Monitor equipment malfunctions
b. Control equipment problems	b. Non-Monitor equipment malfunctions

Emission data summary [1]		CMS performance summary [1]	
c. Process problems		c. Quality assurance calibration	
d. Other known causes		d. Other known causes	
e. Unknown causes		e. Unknown causes	
2. Total duration of excess emission		2. Total CMS Downtime	
3. Total duration of excess emissions × (100) [Total source operating time].	% [2]	3. [Total CMS Downtime] × (100) [Total source operating time].	% [2]

[1] For opacity, record all times in minutes. For gases, record all times in hours.
[2] For the reporting period: If the total duration of excess emissions is 1 percent or greater of the total operating time or the total CMS downtime is 5 percent or greater of the total operating time, both the summary report form and the excess emission report described in § 60.7(c) shall be submitted.

On a separate page, describe any changes since last quarter in CMS, process or controls. I certify that the information contained in this report is true, accurate, and complete.

Name

Signature

Title

Date

(e) Any owner or operator subject to the provisions of this part shall maintain a file of all measurements, including continuous monitoring system, monitoring device, and performance testing measurements; all continuous monitoring system performance evaluations; all continuous monitoring system or monitoring device calibration checks; adjustments and maintenance performed on these systems or devices; and all other information required by this part recorded in a permanent form suitable for inspection. The file shall be retained for at least two years following the date of such measurements, maintenance, reports, and records.

(f) If notification substantially similar to that in paragraph (a) of this section is required by any other State or local agency, sending the Administrator a copy of that notification will satisfy the requirements of paragraph (a) of this section.

(g) Individual subparts of this part may include specific provisions which clarify or make inapplicable the provisions set forth in this section.

[36 FR 24877, Dec. 28, 1971, as amended at 40 FR 46254, Oct. 6, 1975; 40 FR 58418, Dec. 16, 1975; 45 FR 5617, Jan. 23, 1980; 48 FR 48335, Oct. 18, 1983; 50 FR 53113, Dec. 27, 1985; 52 FR 9781, Mar. 26, 1987; 55 FR 51382, Dec. 13, 1990]

§ 60.8 Performance tests.

(a) Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of such facility and at such other times as may be required by the Administrator under section 114 of the Act, the owner or operator of such facility shall conduct performance test(s) and furnish the Administrator a written report of the results of such performance test(s).

(b) Performance tests shall be conducted and data reduced in accordance with the test methods and procedures contained in each applicable subpart unless the Administrator (1) specifies or approves, in specific cases, the use of a reference method with minor changes in methodology, (2) approves the use of an equivalent method, (3) approves the use of an alternative method the results of which he has determined to be adequate for indicating whether a specific source is in compliance, (4) waives the requirement for performance tests because the owner or operator of a source has demonstrated by other means to the Administrator's satisfaction that the affected facility is in compliance with the standard, or (5) approves shorter sampling times and smaller sample volumes when necessitated by process variables or other factors. Nothing in this paragraph shall be construed to abrogate the Administrator's authority to require testing under section 114 of the Act.

(c) Performance tests shall be conducted under such conditions as the Administrator shall specify to the plant operator based on representative performance of the affected facility. The owner or operator shall make available to the Administrator such

mine the conditions of the performance tests. Operations during periods of startup, shutdown, and malfunction shall not constitute representative conditions for the purpose of a performance test nor shall emissions in excess of the level of the applicable emission limit during periods of startup, shutdown, and malfunction be considered a violation of the applicable emission limit unless otherwise specified in the applicable standard.

(d) The owner or operator of an affected facility shall provide the Administrator at least 30 days prior notice of any performance test, except as specified under other subparts, to afford the Administrator the opportunity to have an observer present.

(e) The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as follows:

(1) Sampling ports adequate for test methods applicable to such facility. This includes (i) constructing the air pollution control system such that volumetric flow rates and pollutant emission rates can be accurately determined by applicable test methods and procedures and (ii) providing a stack or duct free of cyclonic flow during performance tests, as demonstrated by applicable test methods and procedures.

(2) Safe sampling platform(s).

(3) Safe access to sampling platform(s).

(4) Utilities for sampling and testing equipment.

(f) Unless otherwise specified in the applicable subpart, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For the purpose of determining compliance with an applicable standard, the arithmetic means of results of the three runs shall apply. In the event that a sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreplaceable portion of the sample train, extreme meteorological conditions, or other circumstances, beyond

pliance may, upon the Administrator's approval, be determined using the arithmetic mean of the results of the two other runs.

[36 FR 24877, Dec. 23, 1971, as amended at 39 FR 9314, Mar. 8, 1974; 42 FR 57126, Nov. 1, 1977; 44 FR 33612, June 11, 1979; 54 FR 6662, Feb. 14, 1989; 54 FR 21344, May 17, 1989]

§ 60.9 Availability of information.

The availability to the public of information provided to, or otherwise obtained by, the Administrator under this part shall be governed by part 2 of this chapter. (Information submitted voluntarily to the Administrator for the purposes of §§ 60.5 and 60.6 is governed by §§ 2.201 through 2.213 of this chapter and not by § 2.301 of this chapter.)

§ 60.10 State authority.

The provisions of this part shall not be construed in any manner to preclude any State or political subdivision thereof from:

(a) Adopting and enforcing any emission standard or limitation applicable to an affected facility, provided that such emission standard or limitation is not less stringent than the standard applicable to such facility.

(b) Requiring the owner or operator of an affected facility to obtain permits, licenses, or approvals prior to initiating construction, modification, or operation of such facility.

§ 60.11 Compliance with standards and maintenance requirements.

(a) Compliance with standards in this part, other than opacity standards, shall be determined only by performance tests established by § 60.8, unless otherwise specified in the applicable standard.

(b) Compliance with opacity standards in this part shall be determined by conducting observations in accordance with Reference Method 9 in appendix A of this part, any alternative method that is approved by the Administrator, or as provided in paragraph (e)(5) of this section. For purposes of determining initial compliance, the minimum total time of ob-

servations shall be 3 hours (30 6-minute averages) for the performance test or other set of observations (meaning those fugitive-type emission sources subject only to an opacity standard).

(c) The opacity standards set forth in this part shall apply at all times except during periods of startup, shutdown, malfunction, and as otherwise provided in the applicable standard.

(d) At all times, including periods of startup, shutdown, and malfunction, owners and operators shall, to the extent practicable, maintain and operate any affected facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

(e)(1) For the purpose of demonstrating initial compliance, opacity observations shall be conducted concurrently with the initial performance test required in § 60.8 unless one of the following conditions apply. If no performance test under § 60.8 is required, then opacity observations shall be conducted within 60 days after achieving the maximum production rate at which the affected facility will be operated but no later than 180 days after initial startup of the facility. If visibility or other conditions prevent the opacity observations from being conducted concurrently with the initial performance test required under § 60.8, the source owner or operator shall reschedule the opacity observations as soon after the initial performance test as possible, but not later than 30 days thereafter, and shall advise the Administrator of the rescheduled date. In these cases, the 30-day prior notification to the Administrator required in § 60.7(a)(6) shall be waived. The rescheduled opacity observations shall be conducted (to the extent possible) under the same operating conditions that existed during the initial performance test conducted under § 60.8. The visible emissions observer shall determine whether visibility or other conditions prevent the opacity observations from being made concurrently with the initial performance test in accordance with procedures contained in Reference Method 9 of appendix B of this part. Opacity readings of portions of plumes which contain condensed, uncombined water vapor shall not be used for purposes of determing compliance with opacity standards. The owner or operator of an affected facility shall make available, upon request by the Administrator, such records as may be necessary to determine the conditions under which the visual observations were made and shall provide evidence indicating proof of current visible observer emission certification. Except as provided in paragraph (e)(5) of this section, the results of continuous monitoring by transmissometer which indicate that the opacity at the time visual observations were made was not in excess of the standard are probative but not conclusive evidence of the actual opacity of an emission, provided that the source shall meet the burden of proving that the instrument used meets (at the time of the alleged violation) Performance Specification 1 in appendix B of this part, has been properly maintained and (at the time of the alleged violation) that the resulting data have not been altered in any way.

(2) Except as provided in paragraph (e)(3) of this section, the owner or operator of an affected facility to which an opacity standard in this part applies shall conduct opacity observations in accordance with paragraph (b) of this section, shall record the opacity of emissions, and shall report to the Administrator the opacity results along with the results of the initial performance test required under § 60.8. The inability of an owner or operator to secure a visible emissions observer shall not be considered a reason for not conducting the opacity observations concurrent with the initial performance test.

(3) The owner or operator of an affected facility to which an opacity standard in this part applies may request the Administrator to determine and to record the opacity of emissions from the affected facility during the initial performance test and at such times as may be required. The owner or operator of the affected facility shall report the opacity results. Any request to the Administrator to determine and to record the opacity of emissions from an affected facility shall be included in the notification required in § 60.7(a)(6). If, for some reason, the Administrator cannot determine and record the opacity of emissions from the affected facility during the performance test, then the provisions of paragraph (e)(1) of this section shall apply.

(4) An owner or operator of an affected facility using a continuous opacity monitor (transmissometer) shall record the monitoring data produced during the initial performance test required by § 60.8 and shall furnish the Administrator a written report of the monitoring results along with Method 9 and § 60.8 performance test results.

(5) An owner or operator of an affected facility subject to an opacity standard may submit, for compliance purposes, continuous opacity monitoring system (COMS) data results produced during any performance test required under § 60.8 in lieu of Method 9 observation data. If an owner or operator elects to submit COMS data for compliance with the opacity standard, he shall notify the Administrator of that decision, in writing, at least 30 days before any performance test required under § 60.8 is conducted. Once the owner or operator of an affected facility has notified the Administrator to that effect, the COMS data results will be used to determine opacity compliance during subsequent tests required under § 60.8 until the owner or operator notifies the Administrator, in writing, to the contrary. For the purpose of determining compliance with the opacity standard during a performance test required under § 60.8 using COMS data, the minimum total time of COMS data collection shall be averages of all 6-minute continuous periods within the duration of the mass emission performance test. Results of the COMS opacity determinations shall be submitted along with the results of the performance test required under § 60.8. The owner or operator of an affected facility using a COMS for compliance purposes is responsible for demonstrating that the COMS meets the requirements specified in § 60.13(c) of this part, that the COMS has been properly maintained and operated, and that the resulting data have not been altered in any way. If COMS data results are submitted for compliance with the opacity standard for a period of time during which Method 9 data indicates noncompliance, the Method 9 data will be used to determine opacity compliance.

(6) Upon receipt from an owner or operator of the written reports of the results of the performance tests required by § 60.8, the opacity observation results and observer certification required by § 60.11(e)(1), and the COMS results, if applicable, the Administrator will make a finding concerning compliance with opacity and other applicable standards. If COMS data results are used to comply with an opacity standard, only those results are required to be submitted along with the performance test results required by § 60.8. If the Administrator finds that an affected facility is in compliance with all applicable standards for which performance tests are conducted in accordance with § 60.8 of this part but during the time such performance tests are being conducted fails to meet any applicable opacity standard, he shall notify the owner or operator and advise him that he may petition the Administrator within 10 days of receipt of notification to make appropriate adjustment to the opacity standard for the affected facility.

(7) The Administrator will grant such a petition upon a demonstration by the owner or operator that the affected facility and associated air pollution control equipment was operated and maintained in a manner to minimize the opacity of emissions during the performance tests; that the performance tests were performed under the conditions established by the Administrator; and that the affected facility and associated air pollution control equipment were incapable of

being adjusted or operated to meet the applicable opacity standard.

(8) The Administrator will establish an opacity standard for the affected facility meeting the above requirements at a level at which the source will be able, as indicated by the performance and opacity tests, to meet the opacity standard at all times during which the source is meeting the mass or concentration emission standard. The Administrator will promulgate the new opacity standard in the FEDERAL REGISTER.

(f) Special provisions set forth under an applicable subpart of this part shall supersede any conflicting provisions of this section.

[38 FR 28565, Oct. 15, 1973, as amended at 39 FR 39873, Nov. 12, 1974; 43 FR 8800, Mar. 3, 1978; 45 FR 23379, Apr. 4, 1980; 48 FR 48335, Oct. 18, 1983; 50 FR 53113, Dec. 27, 1985; 51 FR 1790, Jan. 15, 1986; 52 FR 9781, Mar. 26, 1987]

§ 60.12 Circumvention.

No owner or operator subject to the provisions of this part shall build, erect, install, or use any article, machine, equipment or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard. Such concealment includes, but is not limited to, the use of gaseous diluents to achieve compliance with an opacity standard or with a standard which is based on the concentration of a pollutant in the gases discharged to the atmosphere.

[39 FR 9314, Mar. 8, 1974]

§ 60.13 Monitoring requirements.

(a) For the purposes of this section, all continuous monitoring systems required under applicable subparts shall be subject to the provisions of this section upon promulgation of performance specifications for continuous monitoring systems under appendix B to this part and, if the continuous monitoring system is used to demonstrate compliance with emission limits on a continuous basis, appendix F to this part, unless otherwise specified in an applicable subpart or by the Administrator. Appendix F is applicable December 4, 1987.

(b) All continuous monitoring systems and monitoring devices shall be installed and operational prior to conducting performance tests under § 60.8. Verification of operational status shall, as a minimum, include completion of the manufacturer's written requirements or recommendations for installation, operation, and calibration of the device.

(c) If the owner or operator of an affected facility elects to submit continuous opacity monitoring system (COMS) data for compliance with the opacity standard as provided under § 60.11(e)(5), he shall conduct a performance evaluation of the COMS as specified in Performance Specification 1, appendix B, of this part before the performance test required under § 60.8 is conducted. Otherwise, the owner or operator of an affected facility shall conduct a performance evaluation of the COMS or continuous emission monitoring system (CEMS) during any performance test required under § 60.8 or within 30 days thereafter in accordance with the applicable performance specification in appendix B of this part, The owner or operator of an affected facility shall conduct COMS or CEMS performance evaluations at such other times as may be required by the Administrator under section 114 of the Act.

(1) The owner or operator of an affected facility using a COMS to determine opacity compliance during any performance test required under § 60.8 and as described in § 60.11(e)(5) shall furnish the Administrator two or, upon request, more copies of a written report of the results of the COMS performance evaluation described in paragraph (c) of this section at least 10 days before the performance test required under § 60.8 is conducted.

(2) Except as provided in paragraph (c)(1) of this section, the owner or operator of an affected facility shall furnish the Administrator within 60 days of completion two or, upon request, more copies of a written report of the results of the performance evaluation.

(d)(1) Owners and operators of all continuous emission monitoring systems installed in accordance with the provisions of this part shall check the zero (or low-level value between 0 and

20 percent of span value) and span (50 to 100 percent of span value) calibration drifts at least once daily in accordance with a written procedure. The zero and span shall, as a minimum, be adjusted whenever the 24-hour zero drift or 24-hour span drift exceeds two times the limits of the applicable performance specifications in appendix B. The system must allow the amount of excess zero and span drift measured at the 24-hour interval checks to be recorded and quantified, whenever specified. For continuous monitoring systems measuring opacity of emissions, the optical surfaces exposed to the effluent gases shall be cleaned prior to performing the zero and span drift adjustments except that for systems using automatic zero adjustments. The optical surfaces shall be cleaned when the cumulative automatic zero compensation exceeds 4 percent opacity.

(2) Unless otherwise approved by the Administrator, the following procedures shall be followed for continuous monitoring systems measuring opacity of emissions. Minimum procedures shall include a method for producing a simulated zero opacity condition and an upscale (span) opacity condition using a certified neutral density filter or other related technique to produce a known obscuration of the light beam. Such procedures shall provide a system check of the analyzer internal optical surfaces and all electronic circuitry including the lamp and photodetector assembly.

(e) Except for system breakdowns, repairs, calibration checks, and zero and span adjustments required under paragraph (d) of this section, all continuous monitoring systems shall be in continuous operation and shall meet minimum frequency of operation requirements as follows:

(1) All continuous monitoring systems referenced by paragraph (c) of this section for measuring opacity of emissions shall complete a minimum of one cycle of sampling and analyzing for each successive 10-second period and one cycle of data recording for each successive 6-minute period.

(2) All continuous monitoring systems referenced by paragraph (c) of this section for measuring emissions, except opacity, shall complete a minimum of one cycle of operation (sampling, analyzing, and data recording) for each successive 15-minute period.

(f) All continuous monitoring systems or monitoring devices shall be installed such that representative measurements of emissions or process parameters from the affected facility are obtained. Additional procedures for location of continuous monitoring systems contained in the applicable Performance Specifications of appendix B of this part shall be used.

(g) When the effluents from a single affected facility or two or more affected facilities subject to the same emission standards are combined before being released to the atmosphere, the owner or operator may install applicable continuous monitoring systems on each effluent or on the combined effluent. When the affected facilities are not subject to the same emission standards, separate continuous monitoring systems shall be installed on each effluent. When the effluent from one affected facility is released to the atmosphere through more than one point, the owner or operator shall install an applicable continuous monitoring system on each separate effluent unless the installation of fewer systems is approved by the Administrator. When more than one continuous monitoring system is used to measure the emissions from one affected facility (e.g., multiple breechings, multiple outlets), the owner or operator shall report the results as required from each continuous monitoring system.

(h) Owners or operators of all continuous monitoring systems for measurement of opacity shall reduce all data to 6-minute averages and for continuous monitoring systems other than opacity to 1-hour averages for time periods as defined in § 60.2. Six-minute opacity averages shall be calculated from 36 or more data points equally spaced over each 6-minute period. For continuous monitoring systems other than opacity, 1-hour averages shall be computed from four or more data points equally spaced over each 1-hour period. Data recorder during periods of continuous monitoring system breakdowns, repairs, cali-

bration checks, and zero and span adjustments shall not be included in the data averages computed under this paragraph. An arithmetic or integrated average of all data may be used. The data may be recorded in reduced or nonreduced form (e.g., ppm pollutant and percent O_2 or ng/J of pollutant). All excess emissions shall be converted into units of the standard using the applicable conversion procedures specified in subparts. After conversion into units of the standard, the data may be rounded to the same number of significant digits as used in the applicable subparts to specify the emission limit (e.g., rounded to the nearest 1 percent opacity).

(i) After receipt and consideration of written application, the Administrator may approve alternatives to any monitoring procedures or requirements of this part including, but not limited to the following:

(1) Alternative monitoring requirements when installation of a continuous monitoring system or monitoring device specified by this part would not provide accurate measurements due to liquid water or other interferences caused by substances with the effluent gases.

(2) Alternative monitoring requirements when the affected facility is infrequently operated.

(3) Alternative monitoring requirements to accommodate continuous monitoring systems that require additional measurements to correct for stack moisture conditions.

(4) Alternative locations for installing continuous monitoring systems or monitoring devices when the owner or operator can demonstrate that installation at alternate locations will enable accurate and representative measurements.

(5) Alternative methods of converting pollutant concentration measurements to units of the standards.

(6) Alternative procedures for performing daily checks of zero and span drift that do not involve use of span gases or test cells.

(7) Alternatives to the A.S.T.M. test methods or sampling procedures specified by any subpart.

(8) Alternative continuous monitoring systems that do not meet the design or performance requirements in Performance Specification 1, appendix B, but adequately demonstrate a definite and consistent relationship between its measurements and the measurements of opacity by a system complying with the requirements in Performance Specification 1. The Administrator may require that such demonstration be performed for each affected facility.

(9) Alternative monitoring requirements when the effluent from a single affected facility or the combined effluent from two or more affected facilities are released to the atmosphere through more than one point.

(j) An alternative to the relative accuracy test specified in Performance Specification 2 of appendix B may be requested as follows:

(1) An alternative to the reference method tests for determining relative accuracy is available for sources with emission rates demonstrated to be less than 50 percent of the applicable standard. A source owner or operator may petition the Administrator to waive the relative accuracy test in section 7 of Performance Specification 2 and substitute the procedures in section 10 if the results of a performance test conducted according to the requirements in § 60.8 of this subpart or other tests performed following the criteria in § 60.8 demonstrate that the emission rate of the pollutant of interest in the units of the applicable standard is less than 50 percent of the applicable standard. For sources subject to standards expressed as control efficiency levels, a source owner or operator may petition the Administrator to waive the relative accurancy test and substitute the procedures in section 10 of Performance Specification 2 if the control device exhaust emission rate is less than 50 percent of the level needed to meet the control efficiency requirement. The alternative procedures do not apply if the continuous emission monitoring system is used to determine compliance continuously with the applicable standard. The petition to waive the relative accurancy test shall include a detailed description of the procedures to be applied. Included shall be location and procedure for conducting the alternative.

the concentration or response levels of the alternative RA materials, and the other equipment checks included in the alternative procedure. The Administrator will review the petition for completeness and applicability. The determination to grant a waiver will depend on the intended use of the CEMS data (e.g., data collection purposes other than NSPS) and may require specifications more stringent than in Performance Specification 2 (e.g., the applicable emission limit is more stringent than NSPS).

(2) The waiver of a CEMS relative accuracy test will be reviewed and may be rescinded at such time following successful completion of the alternative RA procedure that the CEMS data indicate the source emissions approaching the level of the applicable standard. The criterion for reviewing the waiver is the collection of CEMS data showing that emissions have exceeded 70 percent of the applicable standard for seven, consecutive, averaging periods as specified by the applicable regulation(s). For sources subject to standards expressed as control efficiency levels, the criterion for reviewing the waiver is the collection of CEMS data showing that exhaust emissons have exceeded 70 percent of the level needed to meet the control efficiency requirement for seven, consecutive, averaging periods as specified by the applicable regulation(s) [e.g., § 60.45(g)(2) and (3), § 60.73(e), and § 60.84(e)]. It is the responsibility of the source operator to maintain records and determine the level of emissions relative to the criterion on the waiver of relative accuracy testing. If this criterion is exceeded, the owner or operator must notify the Administrator within 10 days of such occurrence and include a description of the nature and cause of the increasing emissions. The Administrator will review the notification and may rescind the waiver and require the owner or operator to conduct a relative accuracy test of the CEMS as specified in section 7 of Performance Specification 2.

[40 FR 46255, Oct. 6, 1975; 40 FR 59205, Dec. 22, 1975, as amended at 41 FR 35185, Aug. 20, 1976; 48 FR 13326, Mar. 30, 1983; 48 FR 23610, May 25, 1983; 48 FR 32986, July 20, 1983; 52 FR 9782, Mar. 26, 1987; 52 FR 17555, May 11, 1987; 52 FR 21007, June 4, 1987]

§ 60.14 Modification.

(a) Except as provided under paragraphs (e) and (f) of this section, any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies shall be considered a modification within the meaning of section 111 of the Act. Upon modification, an existing facility shall become an affected facility for each pollutant to which a standard applies and for which there is an increase in the emission rate to the atmosphere.

(b) Emission rate shall be expressed as kg/hr of any pollutant discharged into the atmosphere for which a standard is applicable. The Administrator shall use the following to determine emission rate:

(1) Emission factors as specified in the latest issue of "Compilation of Air Pollutant Emission Factors," EPA Publication No. AP-42, or other emission factors determined by the Administrator to be superior to AP-42 emission factors, in cases where utilization of emission factors demonstrate that the emission level resulting from the physical or operational change will either clearly increase or clearly not increase.

(2) Material balances, continuous monitor data, or manual emission tests in cases where utilization of emission factors as referenced in paragraph (b)(1) of this section does not demonstrate to the Administrator's satisfaction whether the emission level resulting from the physical or operational change will either clearly increase or clearly not increase, or where an owner or operator demonstrates to the Administrator's satisfaction that there are reasonable grounds to dispute the result obtained by the Administrator utilizing emission factors as referenced in paragraph (b)(1) of this section. When the emission rate is based on results from manual emission tests or continuous monitoring systems, the procedures specified in appendix C of this part shall be used to determine whether an increase in emission rate

(e) *Wood residue* means bark, sawdust, slabs, chips, shavings, mill trim, and other wood products derived from wood processing and forest management operations.

(f) *Coal* means all solid fuels classified as anthracite, bituminous, subbituminous, or lignite by the American Society and Testing and Materials, Designation D388-77 (incorporated by reference—see §60.17).

[39 FR 20791, June 14, 1974, as amended at 40 FR 2803, Jan. 16, 1975; 41 FR 51398, Nov. 22, 1976; 43 FR 9278, Mar. 7, 1978; 48 FR 3736, Jan. 27, 1983]

§ 60.42 Standard for particulate matter.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which:

(1) Contain particulate matter in excess of 43 nanograms per joule heat input (0.10 lb per million Btu) derived from fossil fuel or fossil fuel and wood residue.

(2) Exhibit greater than 20 percent opacity except for one six-minute period per hour of not more than 27 percent opacity.

(b)(1) On or after December 28, 1979, no owner or operator shall cause to be discharged into the atmosphere from the Southwestern Public Service Company's Harrington Station #1, in Amarillo, TX, any gases which exhibit greater than 35% opacity, except that a maximum or 42% opacity shall be permitted for not more than 6 minutes in any hour.

(2) Interstate Power Company shall not cause to be discharged into the atmosphere from its Lansing Station Unit No. 4 in Lansing, IA, any gases which exhibit greater than 32% opacity, except that a maximum of 39% opacity shall be permitted for not more than six minutes in any hour.

(3) Omaha Public Power District shall not cause to be discharged into the atmosphere from its Nebraska City Power Station in Nebraska City, NE, any gases which exhibit greater than 30% opacity, except that a maximum of 37% opacity shall be permitted for not more than six minutes in any hour.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 42 FR 61537, Dec. 5, 1977; 44 FR 76787, Dec. 28, 1979; 45 FR 36077, May 29, 1980; 45 FR 47146, July 14, 1980; 46 FR 57498, Nov. 24, 1981]

§ 60.43 Standard for sulfur dioxide.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain sulfur dioxide in excess of:

(1) 340 nanograms per joule heat input (0.80 lb per million Btu) derived from liquid fossil fuel or liquid fossil fuel and wood residue.

(2) 520 nanograms per joule heat input (1.2 lb per million Btu) derived from solid fossil fuel or solid fossil fuel and wood residue, except as provided in paragraph (e) of this section.

(b) When different fossil fuels are burned simultaneously in any combination, the applicable standard (in ng/J) shall be determined by proration using the following formula:

$$PS_{SO_2} = [y(340) + z(520)]/(y+z)$$

where:

PS_{SO_2} is the prorated standard for sulfur dioxide when burning different fuels simultaneously, in nanograms per joule heat input derived from all fossil fuels fired or from all fossil fuels and wood residue fired,

y is the percentage of total heat input derived from liquid fossil fuel, and

z is the percentage of total heat input derived from solid fossil fuel.

(c) Compliance shall be based on the total heat input from all fossil fuels burned, including gaseous fuels.

(d) [Reserved]

(e) Units 1 and 2 (as defined in Appendix G) at the Newton Power Station owned or operated by the Central Illinois Public Service Company will be in compliance with paragraph (a)(2) of this section if Unit 1 and Unit 2 individually comply with paragraph (a)(2) of this section or if the combined emission rate from Units 1 and 2 does not exceed 470 nanograms per joule (1.1 lb per million Btu) combined heat input to Units 1 and 2.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 52 FR 28954, Aug. 4, 1987]

§ 60.44 Standard for nitrogen oxides.

(a) On and after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any affected facility any gases which contain nitrogen oxides, expressed as NO_2 in excess of:

(1) 86 nanograms per joule heat input (0.20 lb per million Btu) derived from gaseous fossil fuel.

(2) 129 nanograms per joule heat input (0.30 lb per million Btu) derived from liquid fossil fuel, liquid fossil fuel and wood residue, or gaseous fossil fuel and wood residue.

(3) 300 nanograms per joule heat input (0.70 lb per million Btu) derived from solid fossil fuel or solid fossil fuel and wood residue (except lignite or a solid fossil fuel containing 25 percent, by weight, or more of coal refuse).

(4) 260 nanograms per joule heat input (0.60 lb per million Btu) derived from lignite or lignite and wood residue (except as provided under paragraph (a)(5) of this section).

(5) 340 nanograms per joule heat input (0.80 lb per million Btu) derived from lignite which is mined in North Dakota, South Dakota, or Montana and which is burned in a cyclone-fired unit.

(b) Except as provided under paragraphs (c) and (d) of this section, when different fossil fuels are burned simultaneously in any combination, the applicable standard (in ng/J) is determined by proration using the following formula:

$$PS_{NO_2} = \frac{w(260) + x(86) + y(130) + z(300)}{w+x+y+z}$$

where:

PS_{NO_2} = is the prorated standard for nitrogen oxides when burning different fuels simultaneously, in nanograms per joule heat input derived from all fossil fuels fired or from all fossil fuels and wood residue fired;

w = is the percentage of total heat input derived from lignite;

x = is the percentage of total heat input derived from gaseous fossil fuel;

y = is the percentage of total heat input derived from liquid fossil fuel; and

z = is the percentage of total heat input derived from solid fossil fuel (except lignite).

(c) When a fossil fuel containing at least 25 percent, by weight, of coal refuse is burned in combination with gaseous, liquid, or other solid fossil fuel or wood residue, the standard for nitrogen oxides does not apply.

(d) Cyclone-fired units which burn fuels containing at least 25 percent of lignite that is mined in North Dakota, South Dakota, or Montana remain subject to paragraph (a)(5) of this section regardless of the types of fuel combusted in combination with that lignite.

[39 FR 20792, June 14, 1974, as amended at 41 FR 51398, Nov. 22, 1976; 43 FR 9278, Mar. 7, 1978; 51 FR 42797, Nov. 25, 1986]

§ 60.45 Emission and fuel monitoring.

(a) Each owner or operator shall install, calibrate, maintain, and operate continuous monitoring systems for measuring the opacity of emissions, sulfur dioxide emissions, nitrogen oxides emissions, and either oxygen or carbon dioxide except as provided in paragraph (b) of this section.

(b) Certain of the continuous monitoring system requirements under paragraph (a) of this section do not apply to owners or operators under the following conditions:

(1) For a fossil fuel-fired steam generator that burns only gaseous fossil fuel, continuous monitoring systems for measuring the opacity of emissions and sulfur dioxide emissions are not required.

(2) For a fossil fuel-fired steam generator that does not use a flue gas desulfurization device, a continuous monitoring system for measuring sulfur dioxide emissions is not required if the owner or operator moni-

ors sulfur dioxide emissions by fuel ampling and analysis under pararaph (d) of this section.

(3) Notwithstanding § 60.13(b), installation of a continuous monitoring ystem for nitrogen oxides may be deayed until after the initial performnce tests under § 60.8 have been conducted. If the owner or operator demonstrates during the performance test hat emissions of nitrogen oxides are less than 70 percent of the applicable standards in § 60.44, a continuous monitoring system for measuring nitrogen oxides emissions is not required. If the initial performance test results show that nitrogen oxide emissions are greater than 70 percent of the applicable standard, the owner or operator shall install a continuous monitoring system for nitrogen oxides within one year after the date of the initial performance tests under § 60.8 and comply with all other applicable monitoring requirements under this part.

(4) If an owner or operator does not install any continuous monitoring systems for sulfur oxides and nitrogen oxides, as provided under paragraphs (b)(1) and (b)(3) or paragraphs (b)(2) and (b)(3) of this section a continuous monitoring system for measuring either oxygen or carbon dioxide is not required.

(c) For performance evaluations under § 60.13(c) and calibration checks under § 60.13(d), the following procedures shall be used:

(1) Methods 6, 7, and 3B, as applicable, shall be used for the performance evaluations of sulfur dioxide and nitrogen oxides continuous monitoring systems. Acceptable alternative methods for Methods 6, 7, and 3B are given in § 60.46(d).

(2) Sulfur dioxide or nitric oxide, as applicable, shall be used for preparing calibration gas mixtures under Performance Specification 2 of Appendix B to this part.

(3) For affected facilities burning fossil fuel(s), the span value for a continuous monitoring system measuring the opacity of emissions shall be 80, 90, or 100 percent and for a continuous monitoring system measuring sulfur oxides or nitrogen oxides the span value shall be determined as follows:

[In parts per million]

Fossil fuel	Span value for sulfur dioxide	Span value for nitrogen oxides
Gas	(1)	500
Liquid	1,000	500
Solid	1,500	1000
Combinations	1,000y+1,500z	500(x+y)+1,000z

[1] Not applicable.

where:

x = the fraction of total heat input derived from gaseous fossil fuel, and

y = the fraction of total heat input derived from liquid fossil fuel, and

z = the fraction of total heat input derived from solid fossil fuel.

(4) All span values computed under paragraph (c)(3) of this section for burning combinations of fossil fuels shall be rounded to the nearest 500 ppm.

(5) For a fossil fuel-fired steam generator that simultaneously burns fossil fuel and nonfossil fuel, the span value of all continuous monitoring systems shall be subject to the Administrator's approval.

(d) [Reserved]

(e) For any continuous monitoring system installed under paragraph (a) of this section, the following conversion procedures shall be used to convert the continuous monitoring data into units of the applicable standards (ng/J, lb/million Btu):

(1) When a continuous monitoring system for measuring oxygen is selected, the measurement of the pollutant concentration and oxygen concentration shall each be on a consistent basis (wet or dry). Alternative procedures approved by the Administrator shall be used when measurements are on a wet basis. When measurements are on a dry basis, the following conversion procedure shall be used:

$$E = CF[20.9/(20.9 - \text{percent } O_2)]$$

where:

E, C, F, and $\%O_2$ are determined under paragraph (f) of this section.

(2) When a continuous monitoring system for measuring carbon dioxide is selected, the measurement of the pollutant concentration and carbon dioxide concentration shall each be on a consistent basis (wet or dry) and the following conversion procedure shall be used:

$$E = CF_c[100/\text{percent } CO_2]$$

where:

E, C, F_c and $\%CO_2$ are determined under paragraph (f) of this section.

(f) The values used in the equations under paragraphs (e) (1) and (2) of this section are derived as follows:

(1) E = pollutant emissions, ng/J (lb/million Btu).

(2) C = pollutant concentration, ng/dscm (lb/dscf), determined by multiplying the average concentration (ppm) for each one-hour period by 4.15×10^{4} M ng/dscm per ppm (2.59×10^{-9} M lb/dscf per ppm) where M = pollutant molecular weight, g/g-mole (lb/lb-mole). M = 64.07 for sulfur dioxide and 46.01 for nitrogen oxides.

(3) $\%O_2$, $\%CO_2$ = oxygen or carbon dioxide volume (expressed as percent), determined with equipment specified under paragraph (a) of this section.

(4) F, F_c = a factor representing a ratio of the volume of dry flue gases generated to the calorific value of the fuel combusted (F), and a factor representing a ratio of the volume of carbon dioxide generated to the calorific value of the fuel combusted (F_c), respectively. Values of F and F_c are given as follows:

(i) For anthracite coal as classified according to ASTM D388-77 (incorporated by reference—see § 60.17), $F = 2{,}723\times10^{-17}$ dscm/J (10,140 dscf/million Btu and $F_c = 0.532\times10^{-17}$ scm CO_2/J (1,980 scf CO_2/million Btu).

(ii) For subbituminous and bituminous coal as classified according to ASTM D388-77 (incorporated by reference—see § 60.17), $F = 2.637\times10^{-7}$ dscm/J (9,820 dscf/million Btu) and $F_c = 0.486\times10^{-7}$ scm CO_2/J (1,810 scf CO_2/million Btu).

(iii) For liquid fossil fuels including crude, residual, and distillate oils, $F = 2.476\times10^{-7}$ dscm/J (9,220 dscf/million Btu) and $F_c = 0.384\times10^{-7}$ scm CO_2/J (1,430 scf CO_2/million Btu).

(iv) For gaseous fossil fuels, $F = 2{,}347\times10^{-7}$ dscm/J (8,740 dscf/million Btu). For natural gas, propane, and butane fuels, $F_c = 0.279\times10^{-7}$ scm CO_2/J (1,040 scf CO_2/million Btu) for natural gas, 0.322×10^{-7} scm CO_2/J (1,200 scf CO_2/million Btu) for propane, and 0.338×10^{-7} scm CO_2/J (1,260 scf CO_2/million Btu) for butane.

(v) For bark $F = 2.589\times10^{-7}$ dscm/J (9,640 dscf/million Btu) and $F_c = 0.500\times10^{-7}$ scm CO_2/J (1,840 scf CO_2/ million Btu). For wood residue other than bark $F = 2.492\times10^{-7}$ dscm/J (9,280 dscf/million Btu) and $F_c = 0.494\times10^{-7}$ scm CO_2/J (1,860 scf CO_2/ million Btu).

(vi) For lignite coal as classified according to ASTM D388-77 (incorporated by reference—see § 60.17), $F = 2.659\times10^{-7}$ dscm/J (9,900 dscf/million Btu) and $F_c = 0.516\times10^{-7}$ scm CO_2/J (1,920 scf CO_2/million Btu).

(5) The owner or operator may use the following equation to determine an F factor (dscm/J or dscf/million Btu) on a dry basis (if it is desired to calculate F on a wet basis, consult the Administrator) or F_c factor (scm CO_2/J, or scf CO_2/million Btu) on either basis in lieu of the F or F_c factors specified in paragraph (f)(4) of this section:

$$F = 10^{-6}\,\frac{[227.2\,(\text{pct. H}) + 95.5\,(\text{pct. C}) + 35.6\,(\text{pct. S}) + 8.7\,(\text{pct. N}) - 28.7\,(\text{pct. O})]}{\text{GCV}}$$

$$F_c = \frac{2.0\times10^{-5}\,(\text{pct. C})}{\text{GCV}}$$

(SI units)

$$F = \frac{10^6[3.64(\%H)+1.53(\%C)+0.57(\%S)+0.14(\%N)-0.46(\%O)]}{GCV}$$

(English units)

$$F_c = \frac{20.0(\%C)}{GCV}$$

(SI units)

$$F_c = \frac{321\times10^3(\%C)}{GCV}$$

(English units)

(i) H, C, S, N, and O are content by weight of hydrogen, carbon, sulfur, nitrogen, and oxygen (expressed as percent), respectively, as determined on the same basis as GCV by ultimate analysis of the fuel fired, using ASTM method D3178-74 or D3176 (solid fuels) or computed from results using ASTM method D1137-53(75), D1945-64(76), or D1946-77 (gaseous fuels) as applicable. (These five methods are incorporated by reference—see § 60.17.)

(ii) GVC is the gross calorific value (kJ/kg, Btu/lb) of the fuel combusted determined by the ASTM test methods D2015-77 for solid fuels and D1826-77 for gaseous fuels as applicable. (These two methods are incorporated by reference—see § 60.17.)

(iii) For affected facilities which fire both fossil fuels and nonfossil fuels, the F or F_c value shall be subject to the Administrator's approval.

(6) For affected facilities firing combinations of fossil fuels or fossil fuels and wood residue, the F or F_c factors determined by paragraphs (f)(4) or (f)(5) of this section shall be prorated in accordance with the applicable formula as follows:

$$F = \sum_{i=1}^{n} X_i F_i \quad \text{or} \quad F_c = \sum_{i=1}^{n} X_i (F_c)_i$$

where:

X_i = the fraction of total heat input derived from each type of fuel (e.g. natural gas, bituminous coal, wood residue, etc.)

F_i or $(F_c)_i$ = the applicable F or F_c factor for each fuel type determined in accordance with paragraphs (f)(4) and (f)(5) of this section.

n = the number of fuels being burned in combination.

(g) Excess emission and monitoring system performance reports shall be submitted to the Administrator for every calendar quarter. All quarterly reports shall be postmarked by the 30th day following the end of each calendar quarter. Each excess emission and MSP report shall include the information required in § 60.7(c). Periods of excess emissions and monitoring systems (MS) downtime that shall be reported are defined as follows:

(1) *Opacity.* Excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 20 percent opacity, except that one six-minute average per hour of up to 27 percent opacity need not be reported.

(i) For sources subject to the opacity standard of § 60.42(b)(1), excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 35 percent opacity, except that one six-minute average per hour of up to 42 percent opacity need not be reported.

(ii) For sources subject to the opacity standard of § 60.42(b)(2), excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 32 percent opacity, except that one six-minute average per hour of up to 39 percent opacity need not be reported.

(iii) For sources subject to the opacity standard of § 60.42(b)(3), excess emissions are defined as any six-minute period during which the average opacity of emissions exceeds 30 percent opacity, except that one six-minute average per hour of up to 37 percent opacity need not be reported.

(2) *Sulfur dioxide.* Excess emissions for affected facilities are defined as:

(i) Any three-hour period during which the average emissions (arithmetic average of three contiguous one-hour periods) of sulfur dioxide as measured by a continuous monitoring system exceed the applicable standard under § 60.43.

(3) *Nitrogen oxides.* Excess emissions for affected facilities using a continuous monitoring system for measuring nitrogen oxides are defined as any three-hour period during which the average emissions (arithmetic average of three contiguous one-hour periods) exceed the applicable standards under § 60.44.

[40 FR 46256, Oct. 6, 1975]

EDITORIAL NOTE: For FEDERAL REGISTER citations affecting § 60.45, see the List of CFR Sections Affected in the Finding Aids section of this volume.

§ 60.46 Test methods and procedures.

(a) In conducting the performance tests required in § 60.8, the owner or operator shall use as reference methods and procedures the test methods in Appendix A of this part or other methods and procedures as specified in this section, except as provided in § 60.8(b). Acceptable alternative methods and procedures are given in paragraph (d) of this section.

(b) The owner or operator shall determine compliance with the particulate matter, SO_2, and NO_x standards in §§ 60.42, 60.43, and 60.44 as follows:

(1) The emission rate (E) of particulate matter, SO_2, or NO_x shall be computed for each run using the following equation:

$$E = C F_d (20.9)/(20.9 - \%O_2)$$

E = emission rate of pollutant, ng/J (lb/million Btu).

C = concentration of pollutant, ng/dscm (lb/dscf).

$\%O_2$ = oxygen concentration, percent dry basis.

F_d = factor as determined from Method 19.

(2) Method 5 shall be used to determine the particular matter concentration (C) at affected facilities without wet flue-gas-desulfurization (FGD) systems and Method 5B shall be used to determine the particulate matter concentration (C) after FGD systems.

(i) The sampling time and sample volume for each run shall be at least 60 minutes and 0.85 dscm (30 dscf). The probe and filter holder heating systems in the sampling train may be set to provide a gas temperature no greater than 160±14 °C (320±25 °F).

(ii) The emission rate correction factor, integrated or grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The O_2 sample shall be obtained simultaneously with, and at the same traverse points as, the particulate sample. If the grab sampling procedure is used, the O_2 concentration for the run shall be the arithmetic mean of all the individual O_2 sample concentrations at each traverse point.

(iii) If the particulate run has more than 12 traverse points, the O_2 traverse points may be reduced to 12 provided that Method 1 is used to locate the 12 O_2 traverse points.

(3) Method 9 and the procedures in § 60.11 shall be used to determine opacity.

(4) Method 6 shall be used to determine the SO_2 concentration.

(i) The sampling site shall be the same as that selected for the particulate sample. The sampling location in the duct shall be at the centroid of the cross section or at a point no closer to the walls than 1 m (3.28 ft). The sampling time and sample volume for each sample run shall be at least 20 minutes and 0.020 dscm (0.71 dscf). Two samples shall be taken during a 1-hour period, with each sample taken within a 30-minute interval.

(ii) The emission rate correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The O_2 sample shall be taken simultaneously with, and at the same point as, the SO_2 sample. The SO_2 emission rate shall be computed for each pair of SO_2 and O_2 samples. The SO_2 emission rate (E) for each run shall be the arithmetic mean of the results of the two pairs of samples.

(5) Method 7 shall be used to determine the NO_x concentration.

(i) The sampling site and location shall be the same as for the SO_2 sample. Each run shall consist of four grab samples, with each sample taken at about 15-minute intervals.

(ii) For each NO_x sample, the emission rate correction factor, grab sampling and analysis procedure of Method 3B shall be used to determine the O_2 concentration ($\%O_2$). The O_2 sample shall be taken simultaneously with, and at the same point as, the NO_x sample.

(iii) The NO_x emission rate shall be computed for each pair of NO_x and O_2 samples. The NO_x emission rate (E) for each run shall be the arithmetic mean of the results of the four pairs of samples.

(c) When combinations of fossil fuels or fossil fuel and wood residue are fired, the owner or operator (in order to compute the prorated standard as shown in §§ 60.43(b) and 60.44(b)) shall determine the percentage (w, x, y, or z) of the total heat input derived from each type of fuel as follows:

(1) The heat input rate of each fuel shall be determined by multiplying the gross calorific value of each fuel fired by the rate of each fuel burned.

(2) ASTM Methods D 2015-77 (solid fuels), D 240-76 (liquid fuels), or D 1826-77 (gaseous fuels) (incorporated by reference—see § 60.17) shall be used to determine the gross calorific values of the fuels. The method used to determine the calorific value of wood residue must be approved by the Administrator.

(3) Suitable methods shall be used to determine the rate of each fuel burned during each test period, and a material balance over the steam generating system shall be used to confirm the rate.

(d) The owner or operator may use the following as alternatives to the reference methods and procedures in this section or in other sections as specified:

(1) The emission rate (E) of particulate matter, SO_2 and NO_x may be determined by using the F_c factor, provided that the following procedure is used:

(i) The emission rate (E) shall be computed using the following equation:

$$E = C\,F_c\,(100/\%CO_2)$$

where:

E = emission rate of pollutant, ng/J (lb/million Btu).

C = concentration of pollutant, ng/dscm (lb/dscf).

$\%CO_2$ = carbon dioxide concentration, percent dry basis.

F_c = factor as determined in appropriate sections of Method 19.

(ii) If and only if the average F_c factor in Method 19 is used to calculate E and either E is from 0.97 to 1.00 of the emission standard or the relative accuracy of a continuous emission monitoring system is from 17 to 20 percent, then three runs of Method 3B shall be used to determine the O_2 and CO_2 concentration according to the procedures in paragraph (b) (2)(ii), (4)(ii), or (5)(ii) of this section. Then if F_o (average of three runs), as calculated from the equation in Method 3B, is more than ±3 percent than the average F_o value, as determined from the average values of F_d and F_c in Method 19, i.e., $F_{oa} = 0.209\ (F_{da}/F_{ca})$, then the following procedure shall be followed:

(A) When F_o is less than 0.97 F_{oa}, then E shall be increased by that proportion under 0.97 F_{oa}, e.g., if F_o is 0.95 F_{oa}, E shall be increased by 2 percent. This recalculated value shall be used to determine compliance with the emission standard.

(B) When F_o is less than 0.97 F_{oa} and when the average difference ($\bar{d}$) between the continuous monitor minus the reference methods is negative, then E shall be increased by that proportion under 0.97 F_{oa}, e.g., if F_o is 0.95 F_{oa}, E shall be increased by 2 percent. This recalculated value shall be used to determine compliance with the relative accuracy specification.

(C) When F_o is greater than 1.03 F_{oa} and when the average difference $\bar{d}$ is positive, then E shall be decreased by that proportion over 1.03 F_{oa}, e.g., if F_o is 1.05 F_{oa}, E shall be decreased by 2 percent. This recalculated value shall be used to determine compliance with the relative accuracy specification.

(2) For Method 5 or 5B, Method 17 may be used at facilities with or without wet FGD systems if the stack gas temperature at the sampling location does not exceed an average temperature of 160 °C (320 °F). The procedures of sections 2.1 and 2.3 of Method 5B may be used with Method 17 only if it is used after wet FGD systems. Method 17 shall not be used after wet FGD systems if the effluent gas is saturated or laden with water droplets.

(3) Particulate matter and SO_2 may be determined simultaneously with the Method 5 train provided that the following changes are made:

(i) The filter and impinger apparatus in sections 2.1.5 and 2.1.6 of

Method 8 is used in place of the condenser (section 2.1.7) of Method 5.

(ii) All applicable procedures in Method 8 for the determination of SO_2 (including moisture) are used:

(4) For Method 6, Method 6C may be used. Method 6A may also be used whenever Methods 6 and 3B data are specified to determine the SO_2 emission rate, under the conditions in paragraph (d)(1) of this section.

(5) For Method 7, Method 7A, 7C, 7D, or 7E may be used. If Method 7C, 7D, or 7E is used, the sampling time for each run shall be at least 1 hour and the integrated sampling approach shall be used to determine the O_2 concentration ($\%O_2$) for the emission rate correction factor.

(6) For Method 3, Method 3A or 3B may be used.

(7) For Method 3B, Method 3A may be used.

[54 FR 6662, Feb. 14, 1989; 54 FR 21344, May 17, 1989, as amended at 55 FR 5212, Feb. 14, 1990]

§ 60.47 Innovative technology waivers; waiver of sulfur dioxide standards of performance for new stationary sources for Homer City Unit No. 3 under section 111(j) of the Clean Air Act for Multi-Steam Coal Cleaning System.

(a) Pursuant to section 111(j) of the Clean Air Act, 42 U.S.C. 7411(j), commencing on November 13, 1981 Pennsylvania Electric Company and New York State Electric & Gas Corporation shall comply with the following terms and conditions for electric generating Units Nos. 1, 2, and 3 at the Homer City Steam Electric Generating Station, Center Township, Indiana County, Pennsylvania.

(b) The foregoing terms and conditions shall remain effective through November 30, 1981, and pursuant to section 111(j)(B), shall be Federally promulgated standards of performance. As such, it shall be unlawful for Pennsylvania Electric Company and New York State Electric & Gas Corporation to operate Units Nos. 1, 2, and 3 in violation of the standards of performance established in this waiver. Violations of the terms and conditions of this waiver shall subject Pennsylvania Electric Company and New York State Electric & Gas Corporation t Federal enforcement under section 113 (b) and (c), 42 U.S.C. 7413 (b) an (c), and 120, 42 U.S.C. 7420, of the Ac as well as possible citizen enforcemen under section 304 of the Act, 42 U.S.C 7604. Pursuant to section 111(c)(1) o the Act, 42 U.S.C. 7411(c)(1), at 45 FR 3109, January 16, 1980, the Administrator delegated to the Commonwealth of Pennsylvania authority to implement and enforce the Federal Standards of Performance for New Stationary Sources of 1.2 lb $SO_2/10^6$ Btu applicable to Homer City Unit No. 3. The SO_2 emission limitations specified in this waiver for Unit No. 3 are new federally promulgated Standards of Performance for New Stationary Sources for a limited time period. Thus, during the period this waiver is effective, the delegated authority of the Commonwealth of Pennsylvania to enforce the Federal Standards of Performance for New Stationary Sources of 1.2 lb $SO_2/10^6$ Btu applicable to Homer City Unit No. 3 is superseded and enforcement of the terms and conditions of this waiver shall be the responsibility of the Administrator of EPA. The Commonwealth of Pennsylvania may, and is encouraged to, seek delegation of authority, pursuant to section 111(c)(1), to enforce the temporary Federal Standards of Performance for New Stationary Sources specified in this waiver. Should such authority be delegated to the State, the terms and conditions of this waiver shall be enforceable by the Administrator of EPA and the Commonwealth of Pennsylvania, concurrently. Nothing in this waiver shall affect the rights of the Commonwealth of Pennsylvania under the Decree filed in the Pennsylvania Commonwealth Court on January 28, 1981, at Docket No. 161 C.D. 1981.

(c) On December 1, 1981, and continuing thereafter, at no time shall emissions of SO_2 from Unit No. 3 exceed 1.2 lb/10^6 Btu of heat input, as specified in 40 CFR 60.43(a)(2) (July 1979).

(d) On January 15, 1982, Pennsylvania Electric Company and New York State Electric & Gas Corporation shall demonstrate compliance at Homer City Unit No. 3 with 40 CFR

3. Procedure

Follow the general procedures in Section 3 of Method 2, except conduct the measurements at the traverse points specified in Method 1A. The static and impact pressure holes of standard pitot tubes are susceptible to plugging in PM–laden gas streams. Therefore, the tester must furnish adequate proof that the openings of the pitot tube have not plugged during the traverse period; this proof can be obained by first recording the velocity head (Δp) reading at the final traverse point, then cleaning out the impact and static holes of the standard pitot tube by "back-purging" with pressurized air, and finally by recording another Δp reading at the final traverse point. If the Δp reading made after the air purge is within 5 percent of the reading during the traverse, then the traverse is acceptable. Otherwise, reject the run. Note that if the Δp at the final traverse point is so low as to make this determination too difficult, then another traverse point may be selected. If "back purging" at regular intervals is part of the procedure, then take comparative Δp readings, as above, for the last two back purges at which suitable high Δp readings are observed.

METHOD 2D—MEASUREMENT OF GAS VOLUMETRIC FLOW RATES IN SMALL PIPES AND DUCTS

1. Applicability and Principle

1.1 Applicability. This method applies to the measurement of gas flow rates in small pipes and ducts, either before or after emission control devices.

1.2 Principle. To measure flow rate or pressure drop, all the stack gas is directed through a rotameter, orifice plate or similar flow rate measuring device. The measuring device has been previously calibrated in a manner that insures its proper calibration for the gas or gas mixture being measured. Absolute temperature and pressure measurements are also made to calculate volumetric flow rates at standard conditions.

2. Apparatus

Specifications for the apparatus are given below. Any other apparatus that has been demonstrated (subject to approval of the Administrator) to be capable of meeting the specifications will be considered acceptable.

2.1 Flow Rate Measuring Device. A rotameter, orifice plate, or other flow rate measuring device capable of measuring all the stack flow rate to within 5 percent of its true value. The measuring device shall be equipped with a temperature gauge accurate to within 2 percent of the minimum absolute stack temperature and a pressure gauge accurate to within 5 mm Hg. The capacity of the measuring device shall be sufficient for the expected maximum and minimum flow rates at the stack gas conditions. The magnitude and variability of stack gas flow rate, molecular weight, temperature, pressure, compressibility, dew point, corrosiveness, and pipe or duct size are all factors to consider in choosing a suitable measuring device.

2.2 Barometer. Same as in Method 2, Section 2.5.

2.3 Stopwatch. Capable of incremental time measurement to within 1 second.

3. Procedure

3.1 Installation. Use the procedure in Method 2A, Section 3.1.

3.2 Leak Check. Use the procedure in Method 2A, Section 3.2.

3.3 Flow Rate Measurement.

3.3.1 Continuous, Steady Flow. At least once an hour, record the measuring device flow rate reading, and the measuring device temperature and pressure. Make a minimum of twelve equally spaced readings of each parameter during the test period. Record the barometric pressure at the beginning and end of the test period. Record the data on a table similar to Figure 2D–1.

_____

_____

Plant_____

Date_____ Run number_____

Sample location_____

Barometric pressure, mm (in.) Hg

Start_____ Finish_____

Operators _____

Measuring device number_____ Calibration coefficient_____

Calibration gas_____

Last date calibrated_____

Time	Flow rate reading	Static pressure mm (in.) Hg	Temperature	
			°C (°F)	°K (°R)
	Average.			

Figure 2D–1. Flow rate measurement data.

3.3.2 Noncontinuous and Nonsteady Flows. Use flow rate measuring devices with particular caution. Calibration will be affected by variation in stack gas temperature, pressure, compressibility, and molecular weight. Use the procedure in Section 3.3.1. Record all the measuring device parameters on a time interval frequency sufficient to adequately profile each process cyclical or noncontinuous event. A multichannel continuous recorder may be used.

4. Calibration

4.1 Flow Rate Measuring Device. Use the procedure in Method 2A, Section 4, and apply the same performance standards. Calibrate the measuring device with the principal stack gas to be measured (e.g., air, nitrogen) against a standard reference meter. A calibrated dry gas meter is an acceptable reference meter. Ideally, calibrate the measuring device in the field with the actual gas to be measured. For measuring devices that have a volume rate readout, calculate the measuring device calibration coefficient, Y_m, for each run as follows:

$$Y_m = \frac{(Q_r)\,(T_r)\,P_{bar}}{(Q_m)\,(T_m)\,(P_{bar} + P_g)} \qquad \text{Eq. 2D–1}$$

where:

Q_r=reference meter flow rate reading, m^3/min (ft^3/min).

Q_m=measuring device flow rate reading, m^3/min (ft^3/min).

T_r=reference meter average absolute temperature, °K (°R).

T_m=measuring device average absolute temperature, °K (°R).

P_{bar}=barometric pressure, mm Hg (in. Hg).

P_g=measuring device average static pressure, mm Hg (in. Hg).

For measuring devices that do not have a readout as flow rate, refer to the manufacturer's instructions to calculate the Q_m corresponding to each Q_r.

4.2 Temperature Gauge. Use the procedure and specifications in Method 2A, Section 4.2. Perform the calibration at a temperature that approximates field test conditions.

4.3 Barometer. Calibrate the barometer to be used in the field test with a mercury barometer prior to the field test.

5. Gas Flow Rate Calculation

Calculate the stack gas flow rate, Q_s, as follows:

$$Q_s = K_1 Y_m Q_m \frac{(P_{bar} + P_g)}{T_m} \qquad \text{Eq. 2D–2}$$

where:

K_1 = 0.3858 for international system of units (SI); 17.64 for English units.

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METHOD 3—GAS ANALYSIS FOR THE DETERMINATION OF DRY MOLECULAR WEIGHT

1. APPLICABILITY AND PRINCIPLE

1.1 Applicability.

1.1.1 This method is applicable for determining carbon dioxide (CO_2) and oxygen (O_2) concentrations and dry molecular weight of a sample from a gas stream of a fossil-fuel combustion process. The method may also be applicable to other processes where it has been determined that compounds other than CO_2, O_2, carbon monoxide (CO), and nitrogen (N_2) are not present in concentrations sufficient to affect the results.

1.1.2 Other methods, as well as modifications to the procedure described herein, are also applicable for some or all of the above determinations. Examples of specific methods and modifications include: (1) A multipoint sampling method using an Orsat analyzer to analyze individual grab samples obtained at each point; (2) a method using CO or O_2 and stoichiometric calculations to determine dry molecular weight; and (3) assigning a value of 30.0 for dry molecular weight, in lieu of actual measurements, for processes burning natural gas, coal, or oil. These methods and modifications may be used, but are subject to the approval of the Administrator, U.S. Environmental Protection Agency (EPA).

1.1.3 Note. Mention of trade names or specific products does not constitute endorsements by EPA.

1.2 Principle. A gas sample is extracted from a stack by one of the following methods: (1) Single-point, grab sampling; (2) single-point, integrated sampling; or (3) multipoint, integrated sampling. The gas sample is analyzed for pecent CO_2, percent O_2, and, if necessary, for percent CO. For dry molecular weight determination, either an Orsat or a Fyrite analyzer may be used for the analysis.

2. APPARATUS

As an alternative to the sampling apparatus and systems described herein, other sampling systems (e.g., liquid displacement) may be used, provided such systems are capable of obtaining a representative sample and maintaining a constant sampling rate, and are otherwise, capable of yielding acceptable r

sults. Use of such systems is subject to the approval of the Administrator.

2.1 Grab Sampling (Figure 3–1).

2.1.1 Probe. Stainless steel or borosilicate glass tubing equipped with an in-stack or out-stack filter to remove particulate matter (a plug of glass wool is satisfactory for this purpose). Any other materials, inert to O_2, CO_2, CO, and N_2 and resistant to temperature at sampling conditions, may be used for the probe. Examples of such materials are aluminum, copper, quartz glass, and Teflon.

2.1.2 Pump. A one-way squeeze bulb, or equivalent, to transport the gas sample to the analyzer.

2.2 Integrated Sampling (Figure 3–2).

2.2.1 Probe. Same as in Section 2.1.1.

2.2.2 Condenser. An air-cooled or water-cooled condenser, or other condenser no greater than 250 ml that will not remove O_2, CO_2, CO, and N_2, to remove excess moisture which would interfere with the operation of the pump and flowmeter.

2.2.3 Valve. A needle valve, to adjust sample gas flow rate.

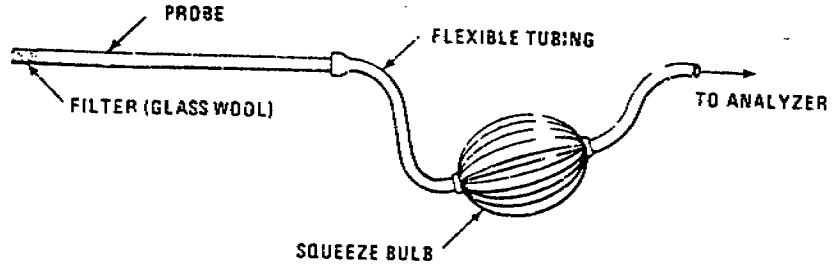

Figure 3-1. Grab-sampling train.

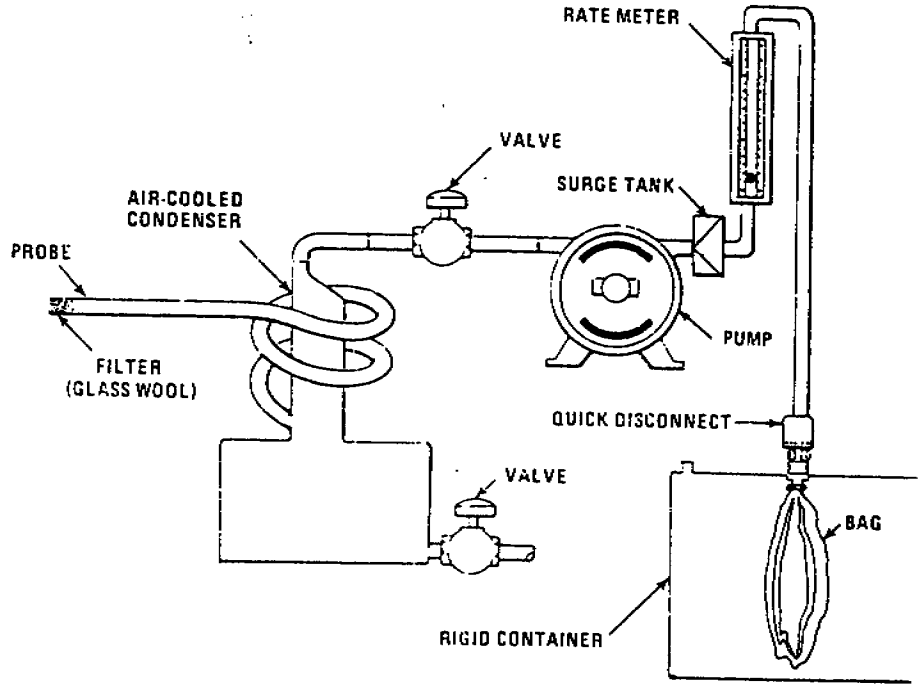

Figure 3-2. Integrated gas-sampling train.

2.2.4 Pump. A leaf-free, diaphragm-type pump, or equivalent, to transport sample gas to the flexible bag. Install a small surge tank between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter.

2.2.5 Rate Meter. A rotameter, or equivalent rate meter, capable of measuring flow rate to within 2 percent of the selected flow rate. A flow rate range of 500 to 1000 cc/min is suggested.

2.2.6 Flexible Bag. Any leak-free plastic (e.g., Tedlar, Mylar, Teflon) or plastic-coated aluminum (e.g., aluminized Mylar) bag, or equivalent, having a capacity consistent with the selected flow rate and time length of the test run. A capacity in the range of 55 to 90 liters is suggested. To leak check the bag, connect it to a water manometer, and pressurize the bag to 5 to 10 cm H_2O (2 to 4 in. H_2O). Allow to stand for 10 minutes. Any displacement in the water manometer indicates a leak. An alternative leak-check method is to pressurize the bag to 5 to 10 cm (2 to 4 in.) H_2O and allow to stand overnight. A deflated bag indicates a leak.

2.2.7 Pressure Gauge. A water-filled U-tube manometer, or equivalent, of about 30 cm (12 in.), for the flexible bag leak check.

2.2.8 Vacuum Gauge. A mercury manometer, or equivalent, of at least 760 mm (30 in.) Hg, for the sampling train leak check.

2.3 Analysis. An Orsat or Fyrite type combustion gas analyzer. For Orsat and Fyrite analyzer maintenance and operation procedures, follow the instructions recommended by the manufacturer, unless otherwise specified herein.

3. Single-Point, Grab Sampling and Analytical Procedure

3.1 The sampling point in the duct shall either be at the centroid of the cross section or at a point no closer to the walls than 1.00 m (3.3 ft), unless otherwise specified by the Administrator.

3.2 Set up the equipment as shown in Figure 3–1, making sure all connections ahead of the analyzer are tight. If an Orsat analyzer is used, it is recommended that the analyzer be leak checked by following the procedure in Section 6; however, the leak check is optional.

3.3 Place the probe in the stack, with the tip of the probe positioned at the sampling point; purge the sampling line long enough to allow at least five exchanges. Draw a sample into the analyzer, and immediately analyze it for percent CO_2 and percent O_2. Determine the percentage of the gas that is N_2 and CO by subtracting the sum of the percent CO_2 and percent O_2O from 100 percent. Calculate the dry molecular weight as indicated in Section 7.2.

3.4 Repeat the sampling, analysis, and calculation procedures until the dry molecular weights of any three grab samples differ from their mean by no more than 0.3 g/g-mole (0.3 lb/lb-mole). Average these three molecular weights, and report the results to the nearest 0.1 g/g-mole (0.1 lb/lb-mole).

4. Single-Point, Integrated Sampling and Analytical Procedure

4.1 The sampling point in the duct shall be located as specified in Section 3.1.

4.2 Leak check (optional) the flexible bag as in Section 2.2.6. Set up the equipment as shown in Figure 3–2. Just before sampling, leak check (optional) the train by placing a vacuum gauge at the condenser inlet, pulling a vacuum of at least 250 mm Hg (10 in. Hg), plugging the outlet at the quick disconnect, and then turning off the pump. The vacuum should remain stable for at least 0.5 minute. Evacuate the flexible bag. Connect the probe, and place it in the stack, with the tip of the probe positioned at the sampling point; purge the sampling line. Next, connect the bag, and make sure that all connections are tight.

4.3 Sample at a constant rate. The sampling run should be simultaneous with, and for the same total length of time as, the pollutant emission rate determination. Collection of at least 30 liters (1.00 ft^3) of sample gas is recommended; however, smaller volumes may be collected, if desired.

4.4 Obtain one integrated flue gas sample during each pollutant emission rate determination. Within 8 hours after the sample is taken, analyze it for percent CO_2 and percent O_2 using either an Orsat analyzer or a Fyrite type combustion gas analyzer. If an Orsat analyzer is used, it is recommended that Orsat leak check described in Section 6, be performed before this determination; however, the check is optional. Determine the percentage of the gas that is N_2 and CO by subtracting the sum of the percent CO_2 and percent 0 from 100 percent. Calculate the dry molecular weight as indicated in Section 7.2.

4.5 Repeat the analysis and calculation procedures until the individual dry molecular weights for any three analyses differ from their mean by no more than 0.3 g/g-mole (0.3 lb/lb-mole). Average these three molecular weights, and report the results to the nearest 0.1 g/g-mole (0.1 lb/lb-mole).

5. Multi-Point, Integrated Sampling and Analytical Procedure

5.1 Unless otherwise specified by the Administrator, a minimum of eight traverse points shall be used for circular stacks having diameters less than 0.61 m (24 in.), a minimum of nine shall be used for rectangular stacks having equivalent diameters less than 0.61 m (24 in.), and a minimum of 12 traverse points shall be used for all other cases. The traverse points shall be located according to Method 1. The use of fewer points is subject to approval of the Administrator.

5.2 Follow the procedures outlined in Sections 4.2 through 4.5, except for the following: Traverse all sampling points, and sample at each point for an equal length of time. Record sampling data as shown in Figure 3–3.

Time	Traverse pt.	Q, liter/min	% dev.*
Average			

* % dev. $= (Q - Q_{avg})/Q_{avg} \times 100$ (Must be ≤10%)

Figure 3–3. Sampling rate data.

6. Leak-Check Procedure for Orsat Analyzer

Moving an Orsat analyzer frequently causes it to leak. Therefore, an Orsat analyzer should be thoroughly leak checked on site before the flue gas sample is introduced into it. The procedure for leak checking an Orsat analyzer is as follows:

6.1 Bring the liquid level in each pipette up to the reference mark on the capillary tubing, and then close the pipette stopcock.

6.2 Raise the leveling bulb sufficiently to bring the confining liquid meniscus onto the graduated portion of the burette, and then close the manifold stopcock.

6.3 Record the meniscus position.

6.4 Observe the menisus in the burette and the liquid level in the pipette for movement over the next 4 minutes.

6.5 For the Orsat analyzer to pass the leak check, two conditions must be met:

6.5.1 The liquid level in each pipette must not fall below the botton of the capillary tubing during this 4-minute interval.

6.5.2 The menisus in the burette must not change by more than 0.2 ml during this 4-minute interval.

6.6 If the anlyzer fails the leak-check procedure, check all rubber connections and stopcocks to determine whether they might be the cause of the leak. Disassemble, clean, and regrease leaking stopcocks. Replace leaking rubber connections. After the analyzer is reassembled, repeat the lead-check procedure.

7. Calculations

7.1 Nomenclature

M_d = Dry molecular weight, g/g-mole (lb/lb-mole).
$\%CO_2$ = Percent CO_2 by volume, dry basis.
$\%O_2$ = Percent O_2 by volume, dry basis.
%CO = Percent CO by volume, dry basis.
$\%N_2$ = Percent N_2 by volume, dry basis.
0.280 = Molecular weight of N_2 or CO, divided by 100.
0.320 = Molecular wight of O_2 divided by 100.
0.440 = Molecular weight of CO_2 divided by 100.

7.2 Dry Molecular Weight. Use Equation 3–1 to calculate the dry molecular weight of the stack gas.

$$M_d = 0.440(\%CO_2) + 0.320\ (\%O_2) + 0.280(\%N_2 + \%CO) \qquad \text{Eq. 3–1}$$

NOTE. The above equation does not consider argon in air (about 0.9 percent, molecular weight of 39.9). A negative error of about 0.4 percent is introduced. The tester may choose to include argon in the analysis using procedures subject to approval of the Administrator.

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Method 3A—Determination of Oxygen and Carbon Dioxide Concentrations in Emissions From Stationary Sources (Instrumental Analyzer Procedure)

1. *Applicability and Principle*

1.1 Applicability. This method is applicable to the determination of oxygen (O_2) and carbon dioxide (CO_2) concentrations in emissions from stationary sources only when specified within the regulations.

1.2 Principle. A sample is continuously extracted from the effluent stream; a portion of the sample stream is conveyed to an instrumental analyzer(s) for determination of O_2 and CO_2 concentration(s). Performance specifications and test procedures are provided to ensure reliable data.

2. *Range and Sensitivity*

Same as Method 6C, Sections 2.1 and 2.2, except that the span of the monitoring system shall be selected such that the average O_2 or CO_2 concentration is not less than 20 percent of the span.

3. *Definitions*

3.1 Measurement System. The total equipment required for the determination of the O_2 or CO_2 concentration. The measurement system consists of the same major sub-

systems as defined in Method 6C, Sections 3.1.1, 3.1.2, and 3.1.3.

3.2 Span, Calibration Gas, Analyzer Calibration Error, Sampling System Bias, Zero Drift, Calibration Drift, Response Time, and Calibration Curve. Same as Method 6C, Sections 3.2 through 3.8, and 3.10.

3.3 Interference Response. The output response of the measurement system to a component in the sample gas, other than the gas component being measured.

4. *Measurement System Performance Specifications*

Same as Method 6C, Sections 4.1 through 4.4.

5. *Apparatus and Reagents*

5.1 Measurement System. Any measurement system for O_2 or CO_2 that meets the specifications of this method. A schematic of an acceptable measurement system is shown in Figure 6C–1 of Method 6C. The essential components of the measurement system are described below:

5.1.1 Sample Probe. A leak-free probe, of sufficient length to traverse the sample points.

5.1.2 Sample Line. Tubing, to transport the sample gas from the probe to the moisture removal system. A heated sample line is not required for systems that measure the O_2 or CO_2 concentration on a dry basis, or transport dry gases.

5.1.3 Sample Transport Line, Calibration Value Assembly, Moisture Removal System, Particulate Filter, Sample Pump, Sample Flow Rate Control, Sample Gas Manifold, and Data Recorder. Same as Method 6C, Sections 5.1.3 through 5.1.9, and 5.1.11, except that the requirements to use stainless steel, Teflon, and nonreactive glass filters do not apply.

5.1.4 Gas Analyzer. An analyzer to determine continuously the O_2 or CO_2 concentration in the sample gas stream. The analyzer shall meet the applicable performance specifications of Section 4. A means of controlling the analyzer flow rate and a device for determining proper sample flow rate (e.g., precision rotameter, pressure gauge downstream of all flow controls, etc.) shall be provided at the analyzer. The requirements for measuring and controlling the analyzer flow rate are not applicable if data are presented that demonstrate the analyzer is insensitive to flow variations over the range encountered during the test.

5.2 Calibration Gases. The calibration gases for CO_2 analyzers shall be CO_2 in N_2 or CO_2 in air. Alternatively, CO_2/SO_2, O_2/SO_2, or $O_2/CO_2/SO_2$ gas mixtures in N_2 may be used. Three calibration gases, as specified Section 5.3.1 through 5.3.3 of Method 6C, shall be used. For O_2 monitors that cannot analyze zero gas, a calibration gas concentration equivalent to less than 10 percent of the span may be used in place of zero gas.

6. *Measurement System Performance Test Procedures*

Perform the following procedures before measurement of emissions (Section 7).

6.1 Calibration Concentration Verification. Follow Section 6.1 of Method 6C, except if calibration gas analysis is required, use Method 3 and change the acceptance criteria for agreement among Method 3 results to 5 percent (or 0.2 percent by volume, whichever is greater).

6.2 Interference Response. Conduct an interference response test of the analyzer prior to its initial use in the field. Thereafter, recheck the measurement system if changes are made in the instrumentation that could alter the interference response (e.g., changes in the type of gas detector). Conduct the interference response in accordance with Section 5.4 of Method 20.

6.3 Measurement System Preparation, Analyzer Calibration Error, and Sampling System Bias Check. Follow Sections 6.2 through 6.4 of Method 6C.

7. *Emission Test Procedure*

7.1 Selection of Sampling Site and Sampling Points. Select a measurement site and sampling points using the same criteria that are applicable to tests performed using Method 3.

7.2 Sample Collection. Position the sampling probe at the first measurement point, and begin sampling at the same rate as used during the sampling system bias check. Maintain constant rate sampling (i.e., ±10 percent) during the entire run. The sampling time per run shall be the same as for tests conducted using Method 3 plus twice the system response time. For each run, use only those measurements obtained after twice the response time of the measurement system has elapsed to determine the average effluent concentration.

7.3 Zero and Calibration Drift Test. Follow Section 7.4 of Method 6C.

8. *Quality Control Procedures*

The following quality control procedures are recommended when the results of this method are used for an emission rate correction factor, or excess air determination. The tester should select one of the following options for validating measurement results:

8.1 If both O_2 and CO_2 are measured using Method 3A, the procedures described in Section 4.4 of Method 3 should be followed to validate the O_2 and CO_2 measurement results.

8.2 If only O_2 is measured using Method 3A, measurements of the sample stream CO_2 concentration should be obtained at the sample by-pass vent discharge using an Orsat or Fyrite analyzer, or equivalent. Duplicate samples should be obtained concurrent with at least one run. Average the duplicate Orsat or Fyrite analysis results for each run. Use the average CO_2 values for comparison with

the O_2 measurements in accordance with the procedures described in Section 4.4 of Method 3.

8.3 If only CO_2 is measured using Method 3A, concurrent measurements of the sample stream CO_2 concentration should be obtained using an Orsat or Fyrite analyzer as described in Section 8.2. For each run, differences greater than 0.5 percent between the Method 3A results and the average of the duplicate Fyrite analysis should be investigated.

9. *Emission Calculation*

For all CO_2 analyzers, and for O_2 analyzers that can be calibrated with zero gas, follow Section 8 of Method 6C, except express all concentrations as percent, rather than ppm.

For O_2 analyzers that use a low-level calibration gas in place of a zero gas, calculate the effluent gas concentration using Equation 3A–1.

$$C_{gas} = \frac{C_{ma} - C_{oa}}{C_m - C_o}(\bar{C} - C_m) + C_{ma}$$

Eq. 3A–1

Where:

C_{gas}=Effluent gas concentration, dry basis, percent.

C_{ma}=Actual concentration of the upscale calibration gas, percent.

C_{oa}=Actual concentration of the low-level calibration gas, percent.

C_m=Average of initial and final system calibration bias check responses for the upscale calibration gas, percent.

C_o=Average of initial and final system calibration bias check responses for the low-level gas, percent.

$\bar{C}$=Average gas concentration indicated by the gas analyzer, dry basis, percent.

10. *Bibliography*

Same as bibliography of Method 6C.

METHOD 3B—GAS ANALYSIS FOR THE DETERMINATION OF EMISSION RATE CORRECTION FACTOR OR EXCESS AIR

1. APPLICABILITY AND PRINCIPLE

1.1 Applicability

1.1.1 This method is applicable for determining carbon dioxide (CO_2), oxygen (O_2), and carbon monoxide (CO) concentrations of a sample from a gas stream of a fossil-fuel combustion provess for excess air or emission rate correction factor calculations.

1.1.2 Other methods, as well as modifications to the procedure described herein, are also applicable for all of the above determinations. Examples of specific methods and modifications include: (1) A multi-point sampling method using an Orsat analyzer to analyze individual grab samples obtained at each point, and (2) a method using CO_2 or and stoichiometric calculations to determi excess air. These methods and modificatio may be used, but are subject to the approv of the Administrator, U.S. Environment Protection Agency (FPA).

1.1.3 Note. Mention of trade names or sp cific products does not constitute endors ment by EPA.

1.2 Principle. A gas sample is extract from a stack by one of the following met ods: (1) Single-point, grab sampling; (2) si gle-point, integrated sampling; or (3) mul point, integrated sampling. The gas samp is analyzed for percent CO_2 percent O_2, ar if necessary, percent CO. An Orsat analyz must be used for excess air or emission ra correction factor determinations.

2. APPARATUS

The alternative sampling systems are t same as those mentioned in Section 2 Method 3.

2.1 Grab Sampling and Integrated Sa pling. Same as in Sections 2.1 and 2.2, resp tively, of Method 3.

2.2 Analysis. An Orsat analyzer only. F low CO_2 (less than 4.0 percent) or high (greater than 15.0 percent) concentratio the measuring burette of the Orsat m have at least 0.1 percent subdivisions. F Orsat maintenance and operation pro dures, follow the instructions recommen by the manufacturer, unless otherwise spe fied herein.

3. PROCEDURES

Each of the three procedures below shall used only when specified in an applica subpart of the standards. The use of th procedures for other purposes must have s cific prior approval of the Adminsitrator.

NOTE.—A Fyrite-type combustion gas a lyzer is not acceptable for excess air or em sion rate correction factor determinatio unless approved by the Administrator. both percent CO_2 and percent O_2 are me ured, the analytical results of any of three procedures given below may be used calculating the dry molecular weight (Method 3).

3.1 Single-Point, Grab Sampling and Analyti Procedure.

3.1.1 The sampling point in the duct sh be as described in Section 3.1 of Method 3.

3.1.2 Set up the equipment as shown in F ure 3–1 of Method 3, making sure all conn tions ahead of the analyzer are tight. L check the Orsat analyzer according to procedure described in Section 6 of Metho This leak check is mandatory.

3.1.3 Place the probe in the stack, w the tip of the probe positioned at the s pling point; purge the sampling line l enough to allow at least five exchan

Draw a sample into the analyzer. For emission rate correction factor determinations, immediately analyze the sample, as outlined in Sections 3.1.4 and 3.1.5, for percent CO_2 or percent O_2. If excess air is desired, proceed as follows: (1) immediately analyze the sample, as in Sections 3.1.4 and 3.1.5, for percent CO_2, O_2, and CO; (2) determine the percentage of the gas that is N_2 by subtracting the sum of the percent CO_2, percent O_2, and percent CO from 100 percent, and (3) calculate percent excess air as outlined in Section 4.2.

3.1.4 To ensure complete absorption of the CO_2, O_2, or if applicable, CO, make repeated passes through each absorbing solution until two consecutive readings are the same. Several passes (three or four) should be made between readings. (If constant readings cannot be obtained after three consecutive readings, replace the absorbing solution.)

NOTE.—Since this single-point, grab sampling and analytical procedure is normally conducted in conjunction with a single-point, grab sampling and analytical procedure for a pollutant, only one analysis is ordinarily conducted. Therefore, great care must be taken to obtain a valid sample and analysis. Although in most cases, only CO_2 or O_2 is required, it is recommended that both CO_2 and O_2 be measured, and that Section 3.4 be used to validate the analytical data.

3.1.5 After the analysis is completed, leak check (mandatory) the Orsat analyzer once again, as described in Section 6 of Method 3. For the results of the analysis to be valid, the Orsat analyzer must pass this leak test before and after the analysis.

3.2 Single-Point, Integrated Sampling and Analytical Procedure.

3.2.1 The sampling point in the duct shall be located as specified in Section 3.1.1.

3.2.2 Leak check (mandatory) the flexible bag as in Section 2.2.6 of Method 3. Set up the equipment as shown in Figure 3–2 of Method 3. Just before sampling, leak check (mandatory) the train as described in Section 4.2 of Method 3.

3.2.3 Sample at a constant rate, or as specified by the Administrator. The sampling run must be simultaneous with, and for the same total length of time as, the pollutant emission rate determination. Collect at least 30 liters (1.00 ft^3) of sample gas. Smaller volumes may be collected, subject to approval of the Administrator.

3.2.4 Obtain one integrated flue gas sample during each pollutant emission rate determination. For emission rate correction factor determination, analyze the sample within 4 hours after it is taken for percent CO_2 or percent O_2 (as outlined in Sections 3.2.5 through 3.2.7). The Orsat analyzer must be leak checked (see Section 6 of Method 3) before the analysis. If excess air is desired, procede as follows: (1) within 4 hours after the sample is taken, analyze it (as in Sections 3.2.5 through 3.2.7) for percent CO_2, O_2, and CO; (2) determine the percentage of the gas that is N_2 by subtracting the sum of the percent CO_2, percent O_2, and percent CO from 100 percent; and (3) calculate percent excess air, as outlined in Section 4.2.

3.2.5 To ensure complete absorption of the CO_2, O_2, or if applicable, CO, follow the procedure described in Section 3.1.4.

NOTE.—Although in most instances only CO_2 or O_2 is required, it is recommended that both CO_2 and O_2 be measured, and that Section 3.4.1 be used to validate the analytical data.

3.2.6 Repeat the analysis until the following criteria are met:

3.2.6.1 For percent CO_2, repeat the analytical procedure until the results of any three analyses differ by no more than (a) 0.3 percent by volume when CO_2 is greater than 4.0 percent or (b) 0.2 percent by volume when CO_2 is less than or equal to 4.0 percent. Average three acceptable values of percent CO_2, and report the results to the nearest 0.2 percent.

3.2.6.2 For percent O_2, repeat the analytical procedure until the results of any three analyses differ by no more than (a) 0.3 percent by volume when O_2 is less than 15.0 percent or (b) 0.2 percent by volume when O_2 is greater than or equal to 15.0 percent. Average the three acceptable values of percent O_2, and report the results to the nearest 0.1 percent.

3.2.6.3 For percent CO, repeat the analytical procedure until the results of any three analyses differ by no more than 0.3 percent. Average the three acceptable values of percent CO, and report the results to the nearest 0.1 percent.

3.2.7 After the analysis is completed, leak check (mandatory) the Orsat analyzer once again, as described in Section 6 of Method 3. For the results of the analysis to be valid, the Orsat analyzer must pass this leak test before and after the analysis.

3.3 Multi-Point, Integrated Sampling and Analytical Procedure.

3.3.1 The sampling points shall be determined as specified in Section 5.3 of Method 3.

3.3.2 Follow the procedures outlined in Sections 3.2.2 through 3.2.7, except for the following: Traverse all sampling points, and sample at each point for an equal length of time. Record sampling data as shown in Figure 3–3 of Method 3.

3.4 Quality Control Procedure.

3.4.1 Data Validation When Both CO_2 and O_2 Are Measured. Although in most instances, only CO_2 or O_2 measurement is required, it is recommended that both CO_2 and O_2 be measured to provide a check on the quality of the data. The following quality control procedure is suggested.

NOTE.—Since the method for validating the CO_2 and O_2 analyses is based on combustion of organic and fossil fuels and dilution of the gas stream with air, this method does not apply to sources that (1) remove CO_2 or O_2 through processes other than combustion, (2) add O_2 (e.g., oxygen enrichment) and N_2 in proportions different from that of air, (3) add CO_2 (e.g., cement or lime kilns) or (4) have no fuel factor, F_o, values obtainable (e.g., extremely variable waste mixtures). This method validates the measured proportions of CO_2 and O_2 for fuel type, but the method does not detect sample dilution resulting from leaks during or after sample collection. The method is applicable for samples collected downstream of most lime or limestone flue-gas desulfurization units as the CO_2 added or removed from the gas stream is not significant in relation to the total CO_2 concentration. The CO_2 concentrations from other types of scrubbers using only water or basic slurry can be significantly affected and would render the F_o check minimally useful.

3.4.1.1 Calculate a fuel factor, F_o, using the following equation:

$$F_o = \frac{20.9 - \%O_2}{\%CO_2} \qquad \text{Eq. 3B–1}$$

where:

$\%O_2$=Percent O_2 by volume, dry basis.
$\%CO_2$=Percent CO_2 by volume, dry basis.
20.9=Percent O_2 by volume in ambient air.

If CO present in quantities measurable by this method, adjust the O_2 and CO_2 values before performing the calculation for F_o as follows:

$\%CO_2\ (adj) = \%CO_2 + \%CO$
$\%O_2\ (adj) = \%O_2 - 0.5\ \%CO$
where:

%5CO = Percent CO by volume, dry basis.

3.4.1.2 Compare the calculated F_o factor with the expected F_o values. The following table may be used in establishing acceptable ranges for the expected F_o if the fuel being burned is known. When fuels are burned in combinations, calculate the combined fuel F_d and F_c factors (as defined in Method 19) according to the procedure in Method 19, Section 5.2.3. Then calculate the F_o factor as follows:

$$F_o = \frac{0.209\ F_d}{F_c} \qquad \text{Eq. 3B–2}$$

Fuel type	F_o range
Coal:	
Anthracite and lignite	1.016–1.1
Bituminous	1.083–1.2
Oil:	
Distillate	1.260–1.4
Residual	1.210–1.3
Gas:	
Natural	1.600–1.8
Propane	1.434–1.5
Butane	1.405–1.5
Wood	1.000–1.1
Wood bark	1.003–1.1

3.4.1.3 Calculated F_o values, beyond the acceptable ranges shown in this table, should be investigated before accepting the test results. For example, the strength of the solutions in the gas analyzer and the analyzing technique should be checked by sampling and analyzing a known concentration, such as air; the fuel factor should be reviewed and verified. An acceptability range of ±12 percent is appropriate for the F_o factor of mixed fuels with variable fuel ratios. The level of the emission rate relative to the compliance level should be considered in determining if a retest is appropriate, i.e., if the measured emissions are much lower or much greater than the compliance limit, repetition of the test would not significantly change the compliance status of the source and would be unnecessarily time consuming and costly.

4. CALCULATIONS

4.1 Nomenclature. Same as Section 5 of Method 3 with the addition of the following:

%EA = Percent excess air.
0.264 = Ratio of O_2 to N_2 in air, v/v.

4.2 Percent Excess Air. Calculate the percent excess air (if applicable) by substituting the appropriate values of percent O_2, CO, and N_2 (obtained from Section 3.1.3 or 3.2.4) into Equation 3B–3.

$$\%EA = \frac{\%O_2 - 0.5\ \%CO}{0.264\ \%N_2 - (\%O_2 - 0.5\ \%CO)} \times 100 \qquad \text{Eq. 3B–3}$$

NOTE.—The equation above assumes that ambient air is used as the source of O_2 and that the fuel does not contain appreciable amounts of N_2 (as do coke oven or blast furnace gases). For those cases when appreciable amounts of N_2 are present (coal, oil and natural gas do not contain appreciable amounts of N_2) or when oxygen enrichment is used, alternative methods, subject to approval of the Administrator, are required.

5. BIBLIOGRAPHY

Same as Method 3.

METHOD 4—DETERMINATION OF MOISTURE CONTENT IN STACK GASES

1. *Principle and Applicability*

1.1 Principle. A gas sample is extracted at a constant rate from the source; moisture is removed from the sample stream and determined either volumetrically or gravimetrically.

1.2 Applicability. This method is applicable for determining the moisture content of stack gas.

Two procedures are given. The first is a reference method, for accurate determinations of moisture content (such as are needed to calculate emission data). The second is an approximation method, which provides estimates of percent moisture to aid in setting isokinetic sampling rates prior to a pollutant emission measurement run. The approximation method described herein is only a suggested approach; alternative means for approximating the moisture content, e.g., drying tubes, wet bulb-dry bulb techniques, condensation techniques, stoichiometric calculations, previous experience, etc., are also acceptable.

The reference method is often conducted simultaneously with a pollutant emission measurement run; when it is, calculation of percent isokinetic, pollutant emission rate, etc., for the run shall be based upon the results of the reference method or its equivalent; these calculations shall not be based upon the results of the approximation method, unless the approximation method is shown, to the satisfaction of the Administrator, U.S. Environmental Protection Agency, to be capable of yielding results within 1 percent H_2O of the reference method.

NOTE: The reference method may yield questionable results when applied to saturated gas streams or to streams that contain water droplets. Therefore, when these conditions exist or are suspected, a second determination of the moisture content shall be made simultaneously with the reference method, as follows: Assume that the gas stream is saturated. Attach a temperature sensor [capable of measuring to ±1° C (2° F)] to the reference method probe. Measure the stack gas temperature at each traverse point (see Section 2.2.1) during the reference method traverse; calculate the average stack gas temperature. Next, determine the moisture percentage, either by: (1) using a psychrometric chart and making appropriate corrections if stack pressure is different from that of the chart, or (2) using saturation vapor pressure tables. In cases where the pyschrometric chart or the saturation vapor pressure tables are not applicable (based on evaluation of the process), alternative methods, subject to the approval of the Administrator, shall be used.

2. *Reference Method*

The procedure described in Method 5 for determining moisture content is acceptable as a reference method.

2.1 Apparatus. A schematic of the sampling train used in this reference method is shown in Figure 4–1. All components shall be maintained and calibrated according to the procedure outlined in Method 5.

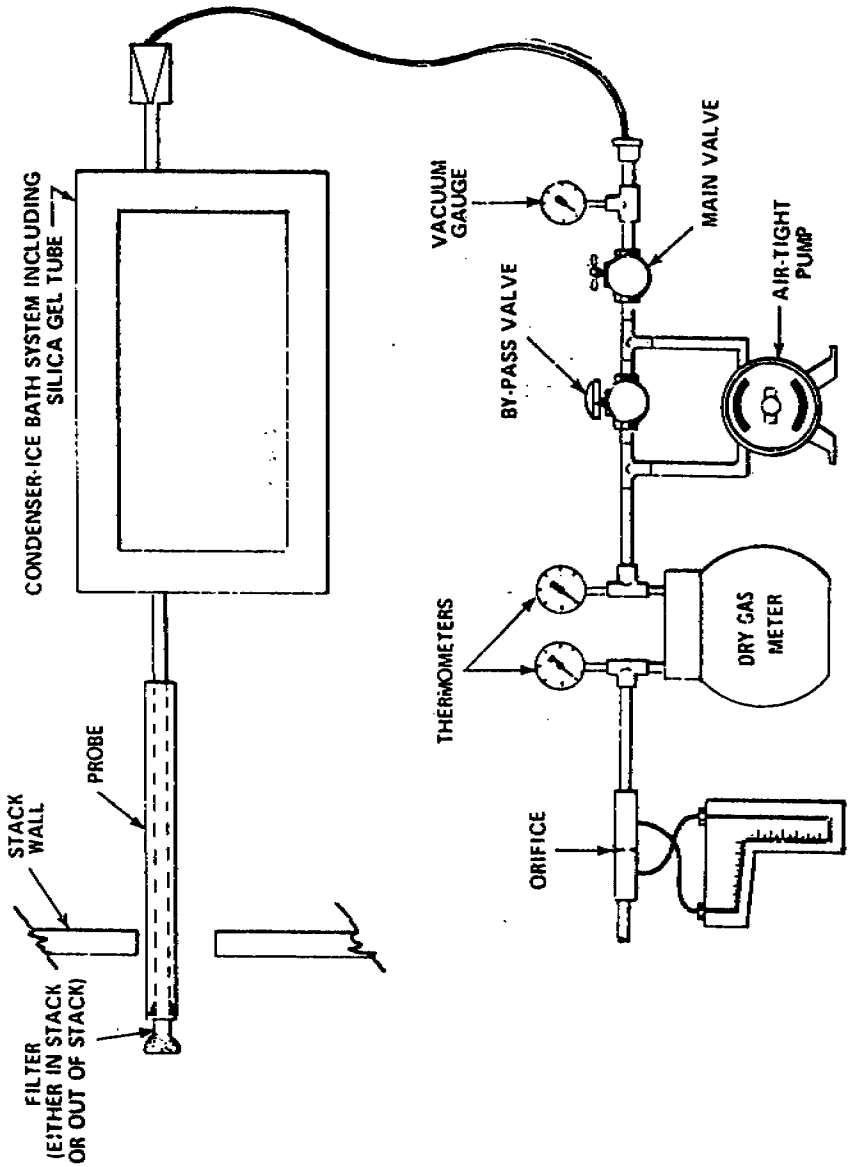

Figure 4-1. Moisture sampling train-reference method.

METHOD 6—DETERMINATION OF SULFUR DIOXIDE EMISSIONS FROM STATIONARY SOURCES

1. *Principle and Applicability*

1.1 Principle. A gas sample is extracted from the sampling point in the stack. The sulfuric acid mist (including sulfur trioxide) and the sulfur dioxide are separated. The sulfur dioxide fraction is measured by the barium-thorin titration method.

1.2 Applicability. This method is applicable for the determination of sulfur dioxide emissions from stationary sources. The minimum detectable limit of the method has been determined to be 3.4 milligrams (mg) of SO_2/m^3 (2.12×10^{-7} lb/ft^3). Although no upper limit has been established, tests have shown that concentrations as high as 80,000 mg/m^3 of SO_2 can be collected efficiently in two midget impingers, each containing 15 milliliters of 3 percent hydrogen peroxide, at a rate of 1.0 lpm for 20 minutes. Based on theoretical calculations, the upper concentration limit in a 20-liter sample is about 93,300 mg/m^3.

Possible interferents are free ammonia, water-soluble cations, and fluorides. The cations and fluorides are removed by glass wool filters and an isopropanol bubbler, and hence do not affect the SO_2 analysis. When samples are being taken from a gas stream with high concentrations of very fine metallic fumes (such as in inlets to control devices), a high-efficiency glass fiber filter must be used in place of the glass wool plug (i.e., the one in the probe) to remove the cation interferents.

Free ammonia interferes by reacting with SO_2 to form particulate sulfite and by reacting with the indicator. If free ammonia is present (this can be determined by knowledge of the process and the presence of white particulate matter in the probe and isopropanol bubbler), the alternative procedures in Section 7.2 shall be used.

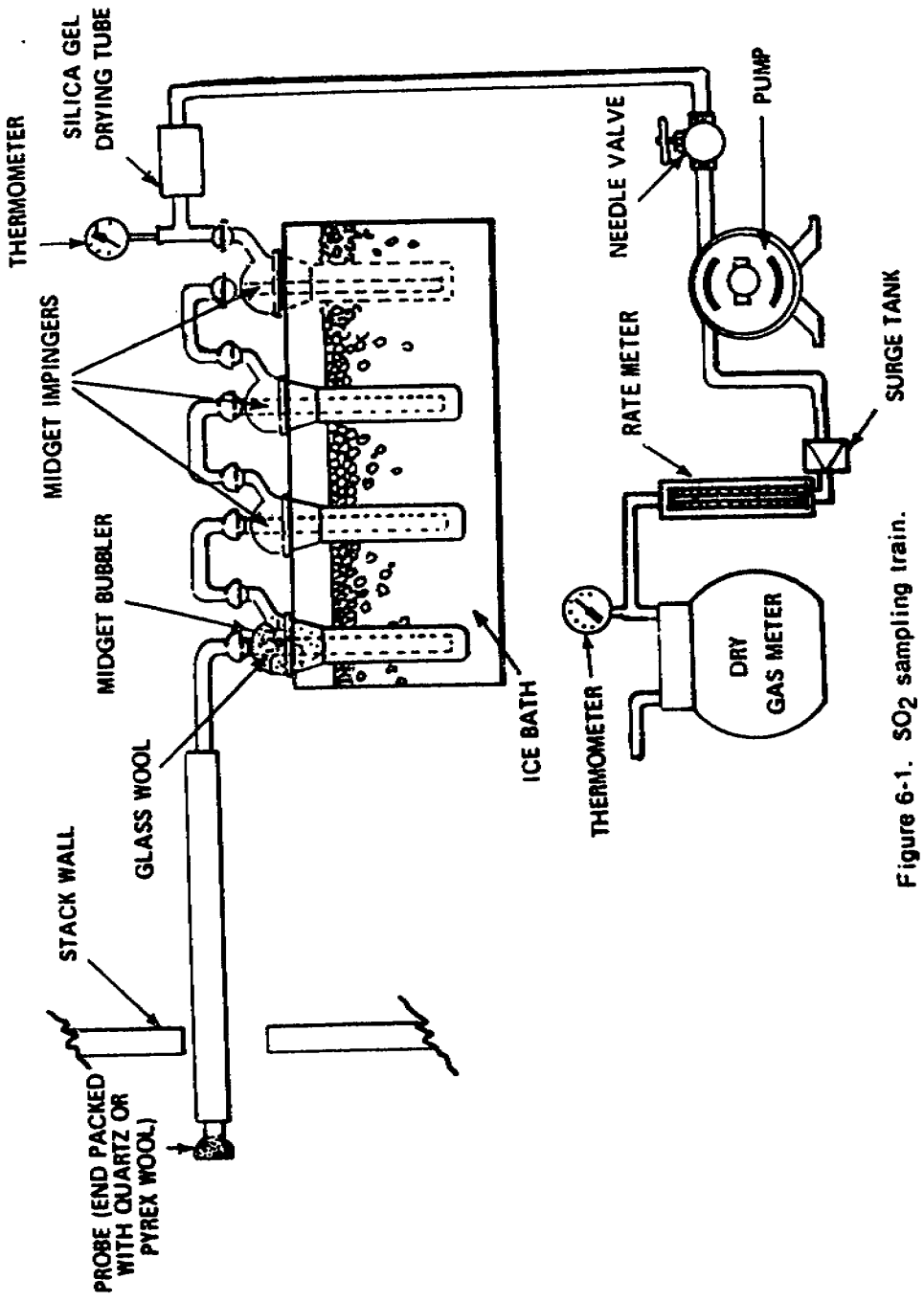

Figure 6-1. SO_2 sampling train.

2. *Apparatus*

2.1 Sampling. The sampling train is shown in Figure 6–1, and component parts are discussed below. The tester has the option of substituting sampling equipment described in Method 8 in place of the midget impinger equipment of Method 6. However, the Method 8 train must be modified to include a heated filter between the probe and isopropanol impinger, and the operation of the sampling train and sample analysis must be at the flow rates and solution volumes defined in Method 8.

The tester also has the option of determining SO_2 simultaneously with particulate matter and moisture determinations by (1) replacing the water in a Method 5 impinger system with 3 percent peroxide solution, or (2) by replacing the Method 5 water impinger system with a Method 8 isopropanol-filter-peroxide system. The analysis for SO_2 must be consistent with the procedure in Method 8.

2.1.1 Probe. Borosilicate glass, or stainless steel (other materials of construction may be used, subject to the approval of the Administrator), approximately 6-mm inside diameter, with a heating system to prevent water condensation and a filter (either in-stack or heated out-stack) to remove particulate matter, including sulfuric acid mist. A plug of glass wool is a satisfactory filter.

2.1.2 Bubbler and Impingers. One midget bubbler, with medium-coarse glass frit and borosilicate or quartz glass wool packed in top (see Figure 6–1) to prevent sulfuric acid mist carryover, and three 30-ml midget impingers. The bubbler and midget impingers must be connected in series with leak-free glass connectors. silicone grease may be used, if necessary, to prevent leakage.

At the option of the tester, a midget impinger may be used in place of the midget bubbler.

Other collection absorbers and flow rates may be used, but are subject to the approval of the Administrator. Also, collection efficiency must be shown to be at least 99 percent for each test run and must be documented in the report. If the efficiency is found to be acceptable after a series of three tests, further documentation is not required. To conduct the efficiency test, an extra absorber must be added and analyzed separately. This extra absorber must not contain more than 1 percent of the total SO_2.

2.1.3 Glass Wool. Borosilicate or quartz.

2.1.4 Stopcock Grease. Acetone-insoluble, heatstable silicone grease may be used, if necessary.

2.1.5 Temperature Gauge. Dial thermometer, or equivalent, to measure temperature of gas leaving impinger train to within 1° C (2° F.)

2.1.6 Drying Tube. Tube packed with 6- to 16-mesh indicating type silica gel, or equivalent, to dry the gas sample and to protect the meter and pump. If the silica gel has been used previously, dry at 175° C (350° F) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to approval of the Administrator.

2.1.7 Valve. Needle valve, to regulate sample gas flow rate.

2.1.8 Pump. Leak-free diaphragm pump, or equivalent, to pull gas through the train. Install a small surge tank between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter.

2.1.9 Rate Meter. Rotameter, or equivalent, capable of measuring flow rate to within 2 percent of the selected flow rate of about 1000 cc/min.

2.1.10 Volume Meter. Dry gas meter, sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate and conditions actually encountered during sampling, and equipped with a temperature gauge (dial thermometer, or equivalent) capable of measuring temperature to within 3° C (5.4° F).

2.1.11 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby National Weather Service station, in which case the station value (which is the absolute barometric pressure) shall be requested and an adjustment for elevation differences between the weather station and sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice versa for elevation decrease.

2.1.12 Vacuum Gauge and Rotameter. At least 760 mm Hg (30 in. Hg) gauge and 0–40 cc/min rotameter, to be used for leak check of the sampling train.

2.2 Sample Recovery.

2.2.1 Wash Bottles. Polyethylene or glass, 500 ml, two.

2.2.2 Storage Bottles. Polyethylene, 100 ml, to store impinger samples (one per sample).

2.3 Analysis.

2.3.1 Pipettes. Volumetric type, 5-ml, 20-ml (one per sample), and 25-ml sizes.

2.3.2 Volumetric Flasks. 100-ml size (one per sample) and 1000 ml size.

2.3.3 Burettes. 5- and 50-ml sizes.

2.3.4 Erlenmeyer Flasks. 250 ml-size (one for each sample, blank, and standard).

2.3.5 Dropping Bottle. 125-ml size, to add indicator.

2.3.6 Graduated Cylinder. 100-ml size.

2.3.7 Spectrophotometer. To measure absorbance at 352 nanometers.

3. *Reagents*

Unless otherwise indicated, all reagents must conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society. Where such specifications are not available, use the best available grade.

3.1 Sampling.

3.1.1 Water. Deionized distilled to conform to ASTM Specification D1193–77, Type 3 (incorporated by reference—see §60.17). At the option of the analyst, the $KMnO_4$ test for oxidizable organic matter may be omitted when high concentrations of organic matter are not expected to be present. Unless otherwise specified, this water shall be used throughout this method.

3.1.2 Isopropanol, 80 percent. Mix 80 ml of isopropanol with 20 ml of water. Check each lot of isopropanol for peroxide impurities as follows: shake 10 ml of isopropanol with 10 ml of freshly prepared 10 percent potassium iodide solution. Prepare a blank by similarly treating 10 ml of water. After 1 minute, read the absorbance at 352 nanometers on a spectrophotometer. If absorbance exceeds 0.1, reject alcohol for use.

Peroxides may be removed from isopropanol by redistilling or by passage through a column of activated alumina; however, reagent grade isopropanol with suitably low peroxide levels may be obtained from commercial sources. Rejection of contaminated lots may, therefore, be a more efficient procedure.

3.1.3 Hydrogen Peroxide, 3 Percent. Dilute 30 percent hydrogen peroxide 1:9 (v/v) with water (30 ml is needed per sample). Prepare fresh daily.

3.1.4 Potassium Iodide Solution, 10 Percent. Dissolve 10.0 grams KI in water and dilute to 100 ml. Prepare when needed.

3.2 Sample Recovery.

3.2.1 Water. Same as in Section 3.1.1.

3.2.2 Isopropanol, 80 Percent. Mix 80 ml of isopropanol with 20 ml of water.

3.3 Analysis.

3.3.1 Water. Same as in Section 3.1.1.

3.3.2 Isopropanol, 100 Percent.

3.3.3 Thorin Indicator. 1-(o-arsonophenylazo)-2-naphthol-3,6-disulfonic acid, disodium salt, or equivalent. Dissolve 0.20 g in 100 ml of water.

3.3.4 Barium Perchlorate Solution, 0.0100 N. Dissolve 1.95 g of barium perchlorate trihydrate [$Ba(ClO_4)_2{\cdot}3H_2O$] in 200 ml water and dilute to 1 liter with isopropanol. Alternatively, 1.22 g of [$BaCl_2{\cdot}2H_2O$] may be used instead of the perchlorate. Standardize as in Section 5.5.

3.3.5 Sulfuric Acid Standard, 0.0100 N. Purchase or standardize to ±0.0002 N against 0.0100 N NaOH which has previously been standardized against potassium acid phthalate (primary standard grade).

3.3.6 Quality Assurance Audit Samples. Sulfate samples in glass vials prepared by EPA's Environmental Monitoring Systems Laboratory, Quality Assurance Division, Source Branch, Mail Drop 77A, Research Triangle Park, North Carolina 27711. Each set will consist of two vials having solutions of unknown concentrations. Only when making compliance determinations, obtain an audit sample set from the Quality Assurance Management office at each EPA regional Office or the responsible enforcement agency. (NOTE: The tester should notify the quality assurance office or the responsible enforcement agency at least 30 days prior to the test date to allow sufficient time for sample delivery.)

3.3.7 Hydrochloric Acid (HCl) Solution, 0.1 N (for use in Section 7.2). Carefully pipette 8.6 ml of concentrated HCl into a 1-liter volumetric flask containing water. Dilute to volume with mixing.

4. *Procedure*

4.1 Sampling.

4.1.1 Preparation of Collection Train. Measure 15 ml of 80 percent isopropanol into the midget bubbler and 15 ml of 3 percent hydrogen peroxide into each of the first two midget impingers. Leave the final midget impinger dry. Assemble the train as shown in Figure 6–1. Adjust probe heater to a temperature sufficient to prevent water condensation. Place crushed ice and water around the impingers.

4.1.2 Leak-Check Procedure. A leak check prior to the sampling run is optional; however, a leak check after the sampling run is mandatory. The leak-check procedure is as follows:

Temporarily attach a suitable (e.g., 0–40 cc/min) rotameter to the outlet of the dry gas meter and place a vacuum gauge at or near the probe inlet. Plug the probe inlet, pull a vaccum of at least 250 mm Hg (10 in. Hg), and note the flow rate as indicated by the rotameter. A leakage rate not in excess of 2 percent of the average sampling rate is acceptable.

NOTE: Carefully release the probe inlet plug before turning off the pump.

It is suggested (not mandatory) that the pump be leak-checked separately, either prior to or after the sampling run. If done prior to the sampling run, the pump leak-check shall precede the leak check of the sampling train described immediately above; if done after the sampling run, the pump leak-check shall follow the train leak-check. To leak check the pump, proceed as follows: Disconnect the drying tube from the probe-impinger assembly. Place a vacuum gauge at the inlet to either the drying tube or the pump, pull a vacuum of 250 mm (10 in.) Hg, plug or pinch off the outlet of the flow meter and then turn off the pump. The vacuum should remain stable for at least 30 seconds.

Other leak-check procedures may be used, subject to the approval of the Adminstrator, U.S. Environmental Protection Agency.

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4.1.3 Sample Collection. Record the initial dry gas meter reading and barometric pressure. To begin sampling, position the tip of the probe at the sampling point, connect the probe to the bubbler, and start the pump. Adjust the sample flow to a constant rate of approximately 1.0 liter/min as indicated by the rotameter. Maintain this constant rate (±10 percent) during the entire sampling run. Take readings (dry gas meter, temperatures at dry gas meter and at impinger outlet, and rate meter) at least every 5 minutes. Add more ice during the run to keep the temperature of the gases leaving the last impinger at 20° C (68° F) or less. At the conclusion of each run, turn off the pump, remove probe from the stack, and record the final readings. Conduct a leak check as in Section 4.1.2 (This leak check is mandatory.) If a leak is found, void the test run, or use procedures acceptable to the Administrator to adjust the sample volume for the leakage. Drain the ice bath, and purge the remaining part of the train by drawing clean ambient air through the system for 15 minutes at the sampling rate.

Clean ambient air can be provided by passing air through a charcoal filter or through an extra midget impinger with 15 ml of 3 percent H_2O_2. The tester may opt to simply use ambient air, without purification.

4.2 Sample Recovery. Disconnect the impingers after purging. Discard the contents of the midget bubbler. Pour the contents of the midget impingers into a leak-free polyethylene bottle for shipment. Rinse the three midget impingers and the connecting tubes with water, and add the washings to the same storage container. Mark the fluid level. Seal and identify the sample container.

4.3 Sample Analysis. Note level of liquid in container, and confirm whether any sample was lost during shipment; note this on analytical data sheet. If a noticeable amount of leakage has occurred, either void the sample or use methods, subject to the approval of the Administrator, to correct the final results.

Transfer the contents of the storage container to a 100-ml volumetric flask and dilute to exactly 100 ml with water. Pipette a 20-ml aliquot of this solution into a 250-ml Erlenmeyer flask, add 80 ml of 100 percent isopropanol and two to four drops of thorin indicator, and titrate to a pink endpoint using 0.0100 N barium perchlorate. Repeat and average the titration volumes. Run a blank with each series of samples. Replicate titrations must agree within 1 percent or 0.2 ml, whichever is larger.

NOTE: Protect the 0.0100 N barium perchlorate solution from evaporation at all times.

4.4 Audit Sample Analysis. Concurrently analyze the two audit samples and a set of compliance samples (Section 4.3) in the same manner to evaluate the technique of the analyst and the standards preparation. (NOTE: It is recommended that known quality control samples be analyzed prior to the compliance and audit sample analysis to optimize the system accuracy and precision. One source of these samples is the Source Branch listed in Section 3.3.6.) The same analysts, analytical reagents, and analytical system shall be used both for compliance samples and the EPA audit samples; if this condition is met, auditing of subsequent compliance analyses for the same enforcement agency within 30 days is not required. An audit sample set may not be used to validate different sets of compliance samples under the jurisdiction of different enforcement agencies, unless prior arrangements are made with both enforcement agencies.

Calculate the concentrations in mg/dscm using the specified sample volume in the audit instructions. (NOTE: Indication of acceptable results may be obtained immediately by reporting the audit results in mg/dscm and compliance results in total mg SO_2/sample by telephone to the responsible enforcement agency.) Include the results of both audit samples, their identification numbers, and the analyst's name with the results of the compliance determination samples in appropriate reports to the EPA regional office or the appropriate enforcement agency. Include this information with subsequent compliance analyses for the same enforcement agency during the 30-day period.

The concentrations of the audit samples obtained by the analyst shall agree within 5 percent of the actual concentrations. If the 5-percent specification is not met, reanalyze the compliance samples and audit samples, and include initial and reanalysis values in the test report (see NOTE in first paragraph of this section).

Failure to meet the 5-percent specification may require retests until the audit problems are resolved. However, if the audit results do not affect the compliance or noncompliance status of the affected facility, the Administrator may waive the reanalysis requirement, further audits, or retests and accept the results of the compliance test. While steps are being taken to resolve audit analysis problems, the Administrator may also choose to use the data to determine the compliance or noncompliance status of the affected facility.

5. *Calibration*

5.1 Metering System.

5.1.1 Initial Calibration. Before its initial use in the field, first leak check the metering system (drying tube, needle valve, pump, rotameter, and dry gas meter) as follows: place a vacuum gauge at the inlet to the drying tube and pull a vaccum of 250 mm (10 in.) Hg; plug or pinch off the outlet of the flow meter, and then turn off the pump. The vaccum shall remain stable for at least 30 seconds. Carefully release the vaccum gauge before releasing the flow meter end.

Next, remove the drying tube and calibrate the metering system (at the sampling flow rate specified by the method) as follows: connect an appropriately sized wet test meter (e.g., 1 liter per revolution) to the inlet of the drying tube. Make three independent calibration runs, using at least five revolutions of the dry gas meter per run. Calculate the calibration factor, Y (wet test meter calibration volume divided by the dry gas meter volume, both volumes adjusted to the same reference temperature and pressure), for each run, and average the results. If any Y value deviates by more than 2 percent from the average, the metering system is unacceptable for use. Otherwise, use the average as the calibration factor for subsequent test runs.

5.1.2 Post-Test Calibration Check. After each field test series, conduct a calibration check as in Section 5.1.1 above, except for the following variations: (a) the leak check is not to be conducted, (b) three, or more revolutions of the dry gas meter may be used, and (c) only two independent runs need be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in Section 5.1.1), then the dry gas meter volumes obtained during the test series are acceptable. If the calibration factor deviates by more than 5 percent, recalibrate the metering system as in Section 5.1.1, and for the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

5.2 Thermometers. Calibrate against mercury-in-glass thermometers.

5.3 Rotameter. The rotameter need not be calibrated but should be cleaned and maintained according to the manufactuturer's instruction.

5.4 Barometer. Calibrate against a mercury barometer.

5.5 Barium Perchlorate Solution. Standardize the barium perchlorate solution against 25 ml of standard sulfuric acid to which 100 ml of 100 percent isopropanol has been added.

Run duplicate analyses. Calculate the normality using the average of a pair of duplicate analyses where the titrations agree within 1 percent or 0.2 ml, whichever is larger.

6. *Calculations*

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculation.

6.1 Nomenclature.

C_{so2}=Concentration of sulfur dioxide, dry basis corrected to standard conditions, mg/dscm (lb/dscf).

N=Normality of barium perchlorate titrant, milliequivalents/ml.

P_{bar}=Barometric pressure at the exit orifice of the dry gas meter, mm Hg (in. Hg).

P_{std}=Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

T_m=Average dry gas meter absolute temperature, °K (°R).

T_{std}=Standard absolute temperature, 293° K (528° R).

V_a=Volume of sample aliquot titrated, ml.

V_m=Dry gas volume as measured by the dry gas meter, dcm (dcf).

$V_{m(std)}$=Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (dscf).

V_{soln}=Total volume of solution in which the sulfur dioxide sample is contained, 100 ml.

V_t=Volume of barium perchlorate titrant used for the sample, ml (average for replicate titrations).

V_{tb}=Volume of barium perchlorate titrant used for the blank, ml.

Y=Dry gas meter calibration factor.

32.03=Equivalent weight of sulfur dioxide.

6.2 Dry Sample Gas Volume, Corrected to Standard Conditions.

$$V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m}\right)\left(\frac{P_{bar}}{P_{std}}\right) = K_1 Y \frac{V_m P_{bar}}{T_m}$$

Equation 6-1

Where:

K_1=0.3858° K/mm Hg for metric units.

=17.64° R/in. Hg for English units.

6.3 Sulfur Dioxide Concentration.

$$C_{SO_2} = K_2 \frac{(V_t - V_{tb})\, N\left(\frac{V_{soln}}{V_a}\right)}{V_{m(std)}}$$

Equation 6-2

Where:

K_2=32.03 mg/meq. for metric units.

=7.061×10^{-5} lb/meq. for English units.

6.4 Relative Error (RE) for QA Audit Samples, Percent.

$$RE = \frac{C_d - C_a}{C_a}(100) \qquad \text{Eq. 6-3}$$

Where:

C_d=Determined audit sample concentration, mg/dscm.

C_a=Actual audit sample concentration, mg/dscm.

7. *Alternative Procedures*

7.1 Dry Gas Meter as a Calibration Standard. A dry gas meter may be used as a calibration standard for volume measurements in place of the wet test meter specified in Section 5.1, provided that it is calibrated initially and recalibrated periodically according to the same procedures outlined in Method 5, Section 7.1, with the following exception: (1) the dry gas meter is calibrated against a wet test meter having a capacity of 1 liter/rev or 3 liters/rev and having the capability of measuring volume to within ±1 percent; (2) the dry gas meter is calibrated at 1 liter/min (2 cfh); and (3) the meter box of the Method 6 sampling train is calibrated at the same flow rate.

7.2 Critical Orifices for Volume and Rate Measurements. A critical orifice may be used in place of the dry gas meter specified in Section 2.1.10, provided that it is selected, calibrated, and used as follows:

7.2.1 Preparation of Collection Train. Prepare the sampling train as shown in Figure 6–2. The rotameter and surge tank are optional but are recommended in order to detect changes in the flow rate.

NOTE: The critical orifices can be adapted to a Method 6 type sampling train as follows: Insert sleeve type, serum bottle stoppers into two reducing unions. Insert the needle into the stoppers as shown in Figure 6–3.

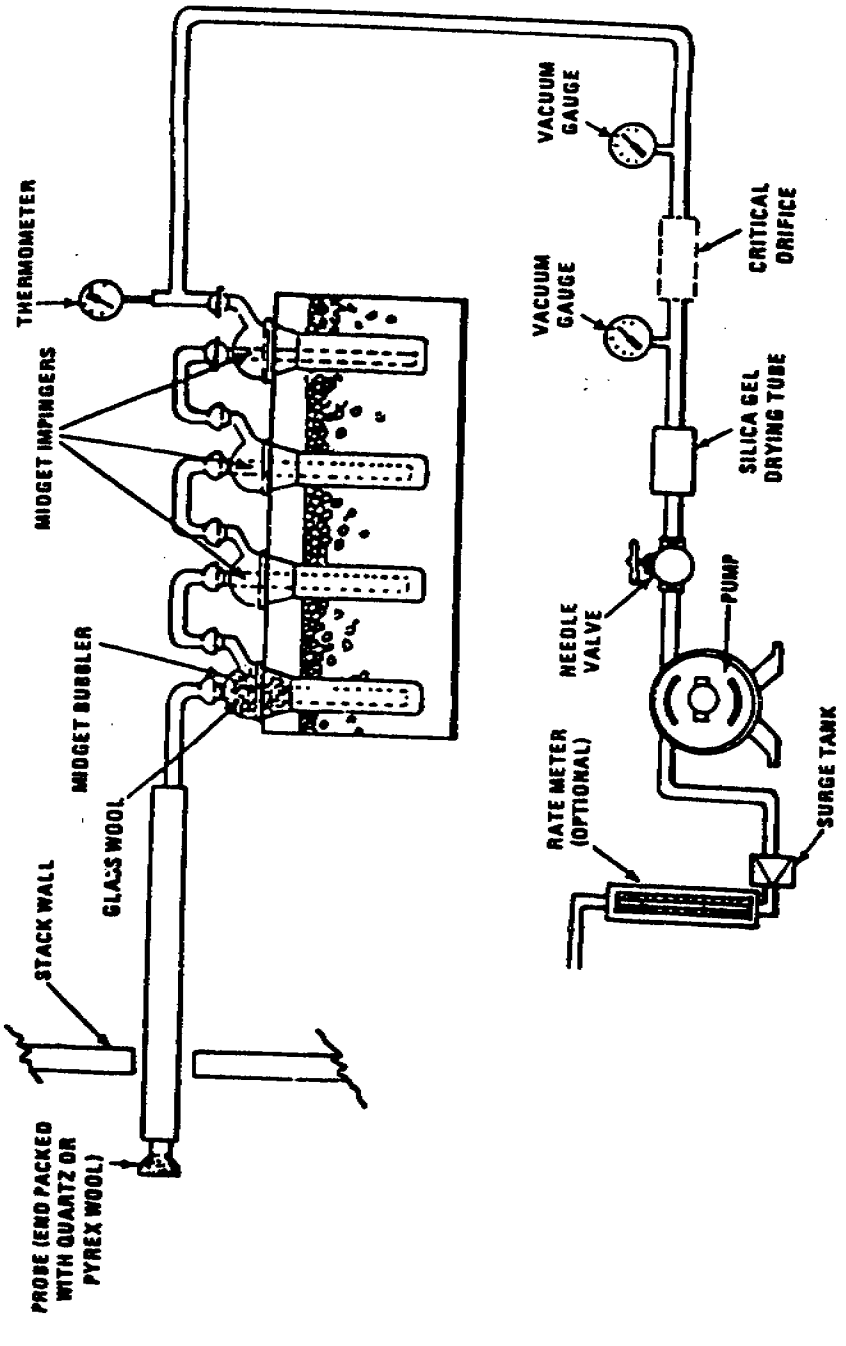

Figure 6-2. SO_2 sampling train using a critical orifice.

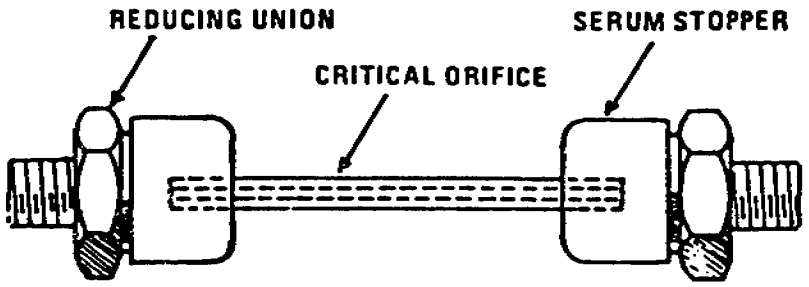

Figure 6-3. Critical orifice adaptation for Method 6 sampling train.

7.2.2 Selection of Critical Orifices. The procedure that follows describes the use of hypodermic needles and stainless steel needle tubings, which have been found suitable for use as critical orifices. Other materials and critical orifice designs may be used provided the orifices act as true critical orifices, i.e., a critical vacuum can be obtained, as described in this section. Select a critical orifice that is sized to operate at the desired flow rate. The needle sizes and tubing lengths shown below give the following approximate flow rates.

Gauge/cm	Flow rate, cc/min	Gauge/cm	Flow rate, cc/min
21/7.6	1100	23/3.8	500
22/2.9	1000	23/5.1	450
22/3.8	900	24/3.2	400

Determine the suitability and the appropriate operating vaccum of the critical orifice as follows: If applicable, temporarily attach a rotameter and surge tank to the outlet of the sampling train. Turn on the pump, and adjust the valve to give an outlet vacuum reading corresponding to about half of the atmospheric pressure. Observe the rotameter reading. Slowly increase the vacuum until a stable reading is obtained on the rotameter. Record the critical vacuum, which is the outlet vacuum when the rotameter first reaches a stable value. Orifices that do not reach a critical value shall not be used.

7.2.3 Field Procedure.

7.2.3.1 Leak-Check Procedure. A leak-check before the sampling run is recommended, but is optional. The leak-check procedure is as follows:

Temporarily attach a suitable (e.g., 0–40 cc/min) rotameter and surge tank, or a soap bubble meter and surge tank to the outlet of the pump. Plug the probe inlet, pull an outlet vacuum of at least 254 mm Hg (10 in. Hg), and note the flow rate as indicated by the rotameter or bubble meter. A leakage rate not in excess of 2 percent of the average sampling rate (Q_{std}) is acceptable. Carefully release the probe inlet plug before turning off the pump.

7.2.3.2 Moisture Determination. At the sampling location, prior to testing, determine the percent moisture of the ambient air using the wet and dry bulb temperatures or, if appropriate, a relative-humidity meter.

7.2.3.3 Critical Orifice Calibration. Prior to testing, at the sampling location, calibrate the entire sampling train using a 500-cc soap bubble meter which is attached to the inlet of the probe and an outlet vacuum of 25 to 50 mm Hg (1 to 2 in. Hg) above the critical vacuum. Record the information listed in Figure 6-4.

Calculate the standard volume of air measured by the soap bubble meter and the volumetric flow rate, using the equations below:

$$V_{sb(std)} = V_{sb}\left(\frac{T_{std}}{T_{amb}}\right)\left(\frac{P_{bar}}{P_{std}}\right) \qquad \text{Eq. 6-4}$$

$$Q_{std} = \frac{V_{sb(std)}}{\theta} \qquad \text{Eq. 6-5}$$

where:

P_{bar}=Barometric pressure, mm Hg (in. Hg).

P_{std}=Standard absolute pressure, 760 mm Hg (29.92 in. Hg).

Q_{std}=Volumetric flow rate through critical orifice, scm/min (scf/min).

T_{amb}=Ambient absolute temperature of air, °K (°R).

T_{std}=Standard absolute temperature, 273°K (528°R).

V_{sb}=Volume of gas as measured by the soap bubble meter, m^3 (ft^3).

$V_{sb(std)}$=Volume of gas as measured by the soap bubble meter, corrected to standard conditions, scm (scf).

θ=Time, min.

Date _____ Train ID _____

Critical orifice size _____ Critical vacuum _____

		Pretest	Post-test
Soap bubble meter volume, V_{sb}	cc		
	m^3 (ft^3)		
Time, θ	sec		
	min		
Barometric pressure, P_{bar}	mm Hg (in. Hg)		
Ambient temperature, t_{amb}	°C (°F)		
Inlet vacuum, P_c	mm Hg (in. Hg)		
Outlet vacuum	mm Hg (in. Hg)		
$V_{sb(std)}$	m^3 (ft^3)		
Flow rate, Q_{std}	$\frac{m^3}{min}\left(\frac{ft^3}{min}\right)$		

Figure 6-4. Critical orifice calibration data.

7.2.3.4 Sampling. Operate the sampling train for sample collection at the same vacuum used during the calibration run. Start the watch and pump simultaneously. Take readings (temperature, rate meter, inlet vacuum, and outlet vacuum) at least every 5 minutes. At the end of the sampling run, stop the watch and pump simultaneously.

Conduct a post-test calibration run using the calibration procedure outlined in Section 7.2.3.3. If the Q_{std} obtained before and after the test differ by more than 5 pecent, void the test run; if not, calculate the volume of the gas measured with the critical orifice, $V_{m(std)}$, using Equation 6–6 and the average of Q_{std} of both runs, as follows:

$$V_{m(std)} = \bar{Q}_{std}\,\theta_s\,(1-B_{wa})\left(\frac{P_{bar}+P_{sr}}{P_{bar}+P_c}\right) \qquad \text{Eq. 6-6}$$

where:

$V_{m(std)}$=Dry gas volume measured with the critical orifice, corrected to standard conditions, dscm (dscf).

Q_{std}=Average flow rate of pretest and post-test calibration runs, scm/min (scf/min).

B_{wa}=Water vapor in ambient air, proportion by volume.

θ_s=Sampling time, min.

P_c=Inlet vacuum reading obtained during the calibration run, mm Hg (in. Hg).

P_{sr}=Inlet vacuum reading obtained during the sampling run, mm Hg (in. Hg).

If the percent difference between the molecular weight of the ambient air at saturated conditions and the sample gas is more than ±3 percent, then the molecular weight of the gas sample must be considered in the calculations using the following equation:

$$V_{m(std)} = \bar{Q}_{std}\,\theta_s\,(1-B_{wa})\sqrt{\frac{M_a}{M_s}}\left(\frac{P_{bar}+P_{sr}}{P_{bar}+P_c}\right) \qquad \text{Eq. 6-7}$$

where:

M_a=Molecular weight of the ambient air saturated at impinger temperature, g/g-mole (lb/lb-mole).

M_s=Molecular weight of the sample gas saturated at impinger temperature, g/g-mole (lb/lb-mole).

NOTE: A post-test leak-check is not necessary because the post-test calibration run results will indicate whether there is any leakage.

Drain the ice bath, and purge the sampling train using the procedure described in Section 4.1.3.

7.3 *Elimination of Ammonia Interference.* The following alternative procedures shall be used in addition to those specified in the method when sampling at sources having ammonia emissions.

7.3.1 *Sampling.* The probe shall be maintained at 275 °C and equipped with a high-efficiency in-stack filter (glass fiber) to remove particulate matter. The filter material shall be unreactive to SO_2. Whatman 934AH (formerly Reeve Angel 934AH) filters treated as described in Citation 10 of the Method 5 bibliography is an example of a filter that has been shown to work. Where alkaline particulate matter and condensed moisture are present in the gas stream, the filter shall be heated above the moisture dew point but below 225 °C.

7.3.2 *Sample Recovery.* Recover the sample according to Section 4.2 except for discarding the contents of the midget bubbler. Add the bubbler contents, including the rinsings of the bubbler with water, to the polyethylene bottle containing the rest of the sample. Under normal testing conditions where sulfur trioxide will not be present significantly, the tester may opt to delete the midget bubbler from the sampling train. If an approximation of the sulfur trioxide concentration is desired, transfer the contents of the midget bubbler to a separate polyethylene bottle.

7.3.3 *Sample Analysis.* Follow the procedures in Section 4.3, except add 0.5 ml of 0.1 N HCl to the Erlenmeyer flask and mix before adding the indicator. The following analysis procedure may be used for an approximation of the sulfur trioxide concentration. The accuracy of the calculated concentration will depend upon the ammonia to SO_2 ratio and the level of oxygen present in the gas stream. A fraction of the SO_2 will be counted as sulfur trioxide as the ammonia to SO_2 ratio and the sample oxygen content increases. Generally, when this ratio is 1 or less and the oxygen content is in the range of 5 percent, less than 10 percent of the SO_2 will be counted as sulfur trioxide. Analyze the peroxide and isopropanol sample portions separately. Analyze the peroxide portion as described above. Sulfur trioxide is determined by difference using sequential titration of the isopropanol portion of the sample. Transfer the contents of the isopropanol storage container to a 100-ml volumetric flask, and dilute to exactly 100 ml with water. Pipette a 20-ml aliquot of this solution into a 250-ml Erlenmeyer flask, add 0.5 ml of 0.1 N HCl, 80 ml of 100 percent isopropanol, and two to four drops of thorin indicator. Titrate to a pink endpoint using 0.0100 N barium perchlorate. Repeat and average the titration volumes that agree within 1 percent or 0.2 ml, whichever is larger. Use this volume in Equation 6–2 to determine the sulfur trioxide concentration. From the flask containing the remainder of the isopropanol sample, determine the fraction of SO_2 collected in the bubbler by pipetting 20-ml aliquots into 250-ml Erlenmeyer flasks. Add 5 ml of 3 percent hydrogen peroxide, 100 ml of 100 percent isopropanol, and two to four drops of thorin indicator, and titrate as before. From this titration volume, subtract the titrant volume determined for sulfur tri-

oxide, and add the titrant volume determined for the peroxide portion. This final volume constitutes V_t, the volume of barium perchlorate used for the SO_2 sample.

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METHOD 6A—DETERMINATION OF SULFUR DIOXIDE, MOISTURE, AND CARBON DIOXIDE EMISSIONS FROM FOSSIL FUEL COMBUSTION SOURCES

1. *Principle and Applicability*

1.1 Applicability. This method applies to the determination of sulfur dioxide (SO_2) emissions from fossil fuel combustion sources in terms of concentration (mg/m^3) and in terms of emission rate (ng/J) and to the determination of carbon dioxide (CO_2) concentration (percent). Moisture, if desired, may also be determined by this method.

The minimum detectable limit, the upper limit, and the interferences of the method for the measurement of SO_2 are the same as for Method 6. For a 20-liter sample, the method has a precision of 0.5 percent CO_2 for concentrations between 2.5 and 25 percent CO_2 and 1.0 percent moisture for moisture concentrations greater than 5 percent.

1.2 Principle. The principle of sample collection is the same as for Method 6 except that moisture and CO_2 are collected in addition to SO_2 in the same sampling train. Moisture and CO_2 fractions are determined gravimetrically.

2. *Apparatus*

2.1 Sampling. The sampling train is shown in Figure 6A–1; the equipment required is the same as for Method 6, Section 2.1, except as specified below:

2.1.1 SO_2 Absorbers. Two 30-ml midget impingers with a 1-mm restricted tip and two 30-ml midget bubblers with an unrestricted tip. Other types of impingers and bubblers, such as Mae West for SO_2 collection and rigid cylinders for moisture absorbers containing Drierite, may be used with proper attention to reagent volumes and levels, subject to the Administrator's approval.

2.1.2 CO_2 Absorber. A sealable rigid cylinder or bottle with an inside diameter between 30 and 90 mm and a length between 125 and 250 mm and with appropriate connections at both ends.

NOTE: For applications downstream of wet scrubbers, a heated out-of-stack filter (either borosilicate glass wool or glass fiber mat) is necessary. The filter may be a separate heated unit or may be within the heated portion of the probe. If the filter is within the sampling probe, the filter should not be within 15 cm of the probe inlet or any unheated section of the probe, such as the connection to the first SO_2 absorber. The probe and filter should be heated to at least 20° C above the source temperature, but not greater than 120° C. The filter temperature (i.e., the sample gas temperature) should be monitored to assure the desired temperature is maintained. A heated Teflon connector may be used to connect the filter holder or probe to the first impinger.

NOTE: Mention of a brand name does not constitute endorsement by the Environmental Protection Agency.

2.2 Sample Recovery and Analysis. The equipment needed for sample recovery and analysis is the same as required for Method 6. In addition, a balance to measure within 0.05 g is needed for analysis.

3. *Reagents*

Unless otherwise indicated, all reagents must conform to the specifications established by the committee on analytical reagents of the American Chemical Society. Where such specifications are not available, use the best available grade.

3.1 Sampling. The reagents required for sampling are the same as specified in Method 6. In addition, the following reagents are required:

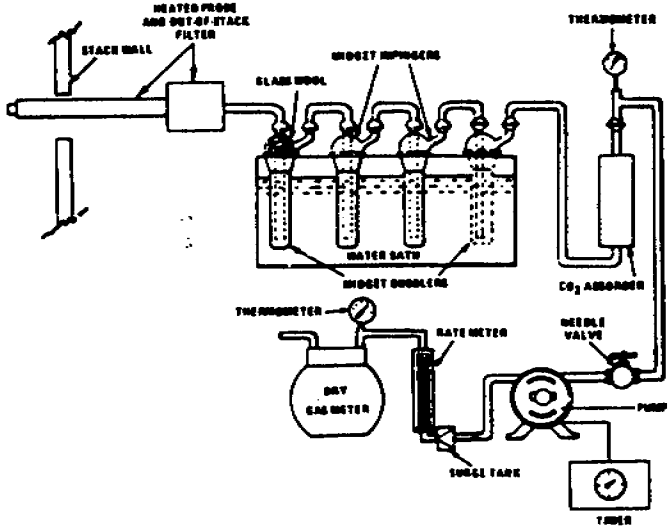

Figure 6A-1. Sampling train.

3.1.1 Drierite. Anhydrous calcium sulfate ($CaSO_4$) desiccant, 8 mesh, indicating type is recommended. (Do not use silica gel or similar desiccant in the application.)

3.1.2 CO_2 Absorbing Material. Ascarite II. Sodium hydroxide coated silica, 8 to 20 mesh.

3.2 Sample Recovery and Analysis. The reagents needed for sample recovery and analysis are the same as for Method 6, Sections 3.2 and 3.3, respectively.

4. *Procedure*

4.1 Sampling.

4.1.1 Preparation of Collection Train. Measure 15 ml of 80 percent isopropanol into the first midget bubbler and 15 ml of 3 percent hydrogen peroxide into each of the first two midget impingers as described in Method 6. Insert the glass wool into the top of the isopropanol bubbler as shown in Figure 6A–1. Into the fourth vessel in the train, the second midget bubbler, place about 25 g of Drierite. Clean the outsides of the bubblers and impingers, and weigh at room temperature (≈20° C) to the nearest 0.1 g. Weigh the four vessels simultaneously, and record this initial mass.

With one end of the CO_2 absorber sealed, place glass wool in the cylinder to a depth of about 1 cm. Place about 150 g of CO_2 absorbing material in the cylinder on top of the glass wool, and fill the remaining space in the cylinder with glass wool. Assemble the cylinder as shown in Figure 6A–2. With the cylinder in a horizontal position, rotate it around the horizontal axis. The CO_2 absorbing material should remain in position during the rotation, and no open spaces or channels should be formed. If necessary, pack more glass wool into the cylinder to make the CO_2 absorbing material stable. Clean the outside of the cylinder of loose dirt and moisture and weigh at room temperature to the nearest 0.1 g. Record this initial mass.

Assemble the train as shown in Figure 6A–1. Adjust the probe heater to a temperature sufficient to prevent condensation (see Note in section 2.1.1). Place crushed ice and water around the impingers and bubblers. Mount the CO_2 absorber outside the water bath in a vertical flow position with the sample gas inlet at the bottom. Flexible tubing, e.g., Tygon, may be used to connect the last SO_2 absorbing bubbler to the Drierite absorber

and to connect the Drierite absorber to the CO_2 absorber. A second, smaller CO_2 absorber containing Ascarite II may be added in line downstream of the primary CO_2 absorber as a breakthrough indicator. Ascarite II turns white when CO_2 is absorbed.

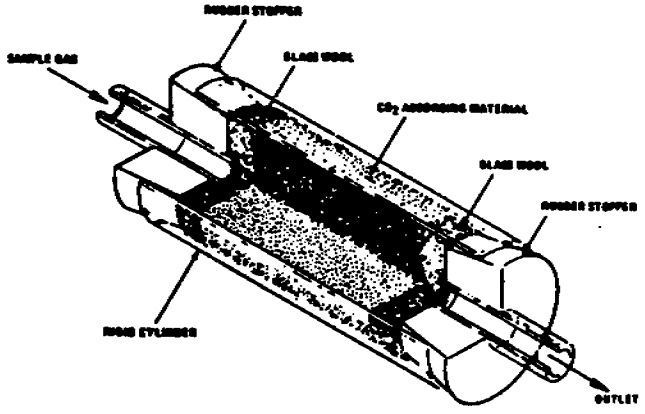

Figure 6A-2. CO_2 absorber.

4.1.2 Leak-Check Procedure and Sample Collection. The leak-check procedure and sample collection procedure are the same as specified in Method 6, Sections 4.1.2 and 4.1.3, respectively.

4.2 Sample Recovery.

4.2.1 Moisture Measurement. Disconnect the isopropanol bubbler, the SO_2 impingers, and the moisture absorber from the sample train. Allow about 10 minutes for them to reach room temperature, clean the outsides of loose dirt and moisture, and weigh them simultaneously in the same manner as in Section 4.1.1. Record this final mass.

4.2.2 Peroxide Solution. Discard the contents of the isopropanol bubbler and pour the contents of the midget impingers into a leak-free polyethylene bottle for shipping. Rinse the two midget impingers and connecting tubes with deionized distilled water, and add the washings to the same storage container.

4.2.3 CO_2 Absorber. Allow the CO_2 absorber to warm to room temperature (about 10 minutes), clean the outside of loose dirt and moisture, and weigh to the nearest 0.1 g in the same manner as in Section 4.1.1. Record this final mass. Discard used Ascarite II material.

4.3 Sample Analysis. The sample analysis procedure for SO_2 is the same as specified in Method 6, Section 4.3.

4.4 Quality Assurance (QA) Audit Samples. Only when this method is used for compliance determinations, obtain an audit sample set as directed in Section 3.3.6 of Method 6. Analyze the audit samples, and report the results as directed in Section 4.4 of Method 6. Acceptance criteria for the audit results are the same as in Method 6.

5. *Calibration*

The calibrations and checks are the same as required in Method 6, Section 5.

6. *Calculations*

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after final calculations. The calculations, nomenclature, and procedures are the same as specified in Method 6 with the addition of the following:

6.1 Nomenclature.

C_w= Concentration of moisture, percent.
C_{CO_2}=Concentration of CO_2, dry basis, percent.
m_{ai}=Initial mass of impingers, bubblers, and moisture absorber, g.
m_{af}=Final mass of impingers, bubblers, and moisture absorber, g.

m_{ai}=Initial mass of CO_2 absorber, g.
m_{af}=Final mass of CO_2 absorber, g.
$V_{CO2(std)}$=Equivalent volume of CO_2 collected at standard conditions, dsm^3.
$V_{w(std)}$=Equivalent volume of moisture collected at standard conditions, sm^3.
5.467×10^{-4}=Equivalent volume of gaseous CO_2 at standard conditions per gram, sm^3/g.
1.336×10^{-3}=Equivalent volume of water vapor at standard conditions per gram, sm^3/g.

6.2 CO_2 Volume Collected, Corrected to Standard Conditions.

$$V_{CO2(std)}=5.467 \times 10^{-4} (m_{af}- m_{ai}) \quad \text{Eq. 6A-1}$$

6.3 Moisture Volume Collected, Corrected to Standard Conditions.

$$V_{w(std)}=1.336 \times 10^{-3} (m_{wf}- m_{wi})$$

Eq. 6A-2

6.4 SO_2 Concentration.

$$C_{SO_2}= 32.03 \frac{(V_t- V_{tb})N\left(\frac{V_{soln}}{V_s}\right)}{V_{m(std)}+ V_{CO_2(std)}}$$

Eq. 6A-3

6.5 CO_2 Concentration.

$$C_{CO_2}=\frac{V_{CO_2(std)}}{V_{m(std)}+ V_{CO_2(std)}}\times 100$$

Eq. 6A-4

6.6 Moisture Concentration.

$$C_w= \frac{V_{w(std)}}{V_{m(std)}+V_{w(std)}+V_{CO2(std)}}$$

Eq. 6A-5

7. *Emission Rate Procedure*

If the only emission measurement desired is in terms of emission rate of SO¶ (ng/J), an abbreviated procedure may be used. The differences between Method 6A and the abbreviated procedure are described below.

7.1 Sample Train. The sample train is the same as shown in Figure 6A-1 and as described in Section 4, except that the dry gas meter is not needed.

7.2 Preparation of the Collection Train. Follow the same procedure as in Section 4.1.1, except do not weigh the isopropanol bubbler, the SO_2 absorbing impingers or the moisture absorber.

7.3 Sampling. Operate the train as described in Section 4.1.3, except that dry gas meter readings, barometric pressure, and dry gas meter temperatures need not be recorded.

7.4 Sample Recovery. Follow the procedure in Section 4.2, except do not weigh the isopropanol bubbler, the SO_2 absorbing impingers, or the moisture absorber.

7.5 Sample Analysis. Analysis of the peroxide solution is the same as described in Section 4.3. Only when making compliance determinations, conduct an audit of the SO_2 analysis procedure as described in Section 4.4.

7.6 Calculations.

7.6.1 SO_2 Mass Collected.

$$m_{SO_2} = 32.03 (V_t - V_{tb}) N (V_{soln}/V_s)$$

Eq. 6A-7

Where:

m_{SO2}=Mass of SO_2 collected, mg.

7.6.2 Sulfur Dioxide Emission Rate.

$$E_{SO_2} = F_c (1.829 \times 10^9) \frac{m_{SO_2}}{(m_{af} - m_{ai})}$$

Eq. 6A 8

Where:

E_{SO2}=Emission rate of SO_2 (ng/J).
F_c=Carbon F Factor for the fuel burned, m^3/J, from Method 19.

8. *Bibliography*

1. Same as for Method 6, Citations 1 through 8, with the addition of the following:
2. Stanley, Jon and P.R. Westlin. An Alternate Method for Stack Gas Moisture Determination. Source Evaluation Society Newsletter. Vol. 3, No. 4. November 1978.
3. Whittle, Richard N. and P.R. Westlin. Air Pollution Test Report: Development and Evaluation of an Intermittent Integrated SO_2/CO_2 Emission Sampling Procedure. Environmental Protection Agency, Emission Standard and Engineering Division, Emission Measurement Branch. Research Triangle Park, NC. December 1979. 14 pages.

Method 6B—Determination of Sulfur Dioxide and Carbon Dioxide Daily Average Emissions From Fossil Fuel Combustion Sources

1. *Principle and Applicability*

1.1 Applicability. This method applies to the determination of sulfur dioxide (SO_2) emissions from combustion sources in terms of concentration (ng/m^3) and emission rate (ng/J), and for the determination of carbon dioxide (CO_2) concentration (percent) on a daily (24 hours) basis.

The minimum detectable limits, upper limit, and the interferences for SO_2 measurements are the same as for Method 6. EPA-sponsored collaborative studies were undertaken to determine the magnitude of repeatability and reproducibility achievable by qualified testers following the procedures in this method. The results of the studies evolve from 145 field tests including comparisons with Methods 3 and 6. For measurements of emission rates from wet, flue gas desulfurization units in (ng/J), the repeatability (within laboratory precision) is 8.0 percent and the reproducibility (between laboratory precision) is 11.1 percent.

1.2 Principle. A gas sample is extracted from the sampling point in the stack inter-

mittently over a 24-hour or other specified time period. Sampling may also be conducted continuously if the apparatus and procedures are appropriately modified (see Note in Section 4.1.1). The SO_2 and CO_2 are separated and collected in the sampling train. The SO_2 fraction is measured by the barium-thorin titration method, and CO_2 is determined gravimetrically.

2. *Apparatus*

The equipment required for this method is the same as specified for Method 6A, Section 2, except the isopropanol bubbler is not used. An empty bubbler for the collection of liquid droplets and does not allow direct contact between the collected liquid and the gas sample may be included in the train. For intermittent operation, include an industrial timer-switch designed to operate in the "on" position at least 2 minutes continuously and "off" the remaining period over a repeating cycle. The cycle of operation in designated in the applicable regulation. At a minimum, the sampling operation should include at least 12, equal, evenly-spaced periods per 24 hours.

For applications downstream of wet scrubbers, a heated out-of-stack filter (either borosilicate glass wool or glass fiber mat) is necessary. The probe and filter should be heated continuously to at least 20° C above the source temperature, but not greater than 120° C. The filter (i.e., sample gas) temperature should be monitored to assure the desired temperature is maintained.

Stainless steel sampling probes, type 316, are not recommended for use with Method 6B because of potential corrosion and contamination of sample. Glass probes or other types of stainless steel, e.g., Hasteloy or Carpenter 20, are recommended for long-term use.

Other sampling equipment, such as Mae West bubblers and rigid cylinders for moisture absorption, which requires sample or reagent volumes other than those specified in this procedure for full effectiveness may be used, subject to the approval of the Administrator.

3. *Reagents*

All reagents for sampling and analysis are the same as described in Method 6A, Section 3, except isopropanol is not used for sampling. The hydrogen peroxide absorbing solution shall be diluted to no less than 6 percent by volume, instead of 3 percent as specified in Method 6. If Method 6B is to be operated in a low sample flow condition (less than 100 ml/min), molecular sieve material may be substituted for Ascarite II as the CO_2 absorbing material. The recommended molecular sieve material is Union Carbide 1/16 inch pellets, 5A°, or equivalent. Molecular sieve material need not be discarded following the sampling run provided it is regenerated as per the manufacturer's instruction. Use of molecular sieve material at flow rates higher than 100 ml/min may cause erroneous CO_2 results.

4. *Procedure*

4.1 Sampling.

4.1.1 Preparation of Collection Train. Preparation of the sample train is the same as described in Method 6A, Section 4.1.4, with the addition of the following:

The sampling train is assembled as shown in Figure 6A–1, except the isopropanol bubbler is not included. The probe must be heated to a temperature sufficient to prevent water condensation and must include a filter (either in-stack, out-of-stack, or both) to prevent particulate entrainment in the peroxide impingers. The electric supply for the probe heat should be continuous and separate from the timed operation of the sample pump.

Adjust the timer-switch to operate in the "on" position from 2 to 4 minutes on a 2-hour repeating cycle or other cycle specified in the applicable regulation. Other timer sequences may be used with the restriction that the total sample volume collected is between 25 and 60 liters for the amounts of sampling reagents prescribed in this method.

Add cold water to the tank until the impingers and bubblers are covered at least two-thirds of their length. The impingers and bubbler tank must be covered and protected from intense heat and direct sunlight. If freezing conditions exist, the impinger solution and the water bath must be protected.

NOTE: Sampling may be conducted continuously if a low flow-rate sample pump (20 to 40 ml/min for the reagent volumes described in this method) is used. Then the timer-switch is not necessary. In addition, if the sample pump is designed for constant rate sampling, the rate meter may be deleted. The total gas volume collected should be between 25 and 60 liters for the amounts of sampling reagents prescribed in this method.

4.1.2 Leak-Check Procedure. The leak-check procedure is the same as described in Method 6, Section 4.1.2.

4.1.3 Sample Collection. Record the initial dry gas meter reading. To begin sampling, position the tip of the probe at the sampling point, connect the probe to the first impinger (or filter), and start the timer and the sample pump. Adjust the sample flow to a constant rate of approximately 1.0 liter/min as indicated by the rotameter. Assure that the timer is operating as intended, i.e., in the "on" position for the desired period and the cycle repeats as required.

During the 24-hour sampling period, record the dry gas meter temperature one time between 9:00 a.m. and 11:00 a.m., and the barometric pressure.

At the conclusion of the run, turn off the timer and the sample pump, remove the probe from the stack, and record the final gas meter volume reading. Conduct a leak

check as described in Section 4.1.2. If a leak is found, void the test run or use procedures acceptable to the Administrator to adjust the sample volume for leakage. Repeat the steps in this section (4.1.3) for successive runs.

4.2 Sample Recovery. The procedures for sample recovery (moisture measurement, peroxide solution, and CO_2 absorber) are the same as in Method 6A, Section 4.2.

4.3 Sample Analysis. Analysis of the peroxide impinger solutions is the same as in Method 6, Section 4.3.

4.4 Quality Assurance (QA) Audit Samples. Only when this method is used for compliance determinations, obtain an audit sample set as directed in Section 3.3.6 of Method 6. Analyze the audit samples at least once for every 30 days of sample collection, and report the results as directed in Section 4.4 of Method 6. The analyst performing the sample analyses shall perform the audit analyses. If more than one analyst performed the sample analyses during the 30-day sampling period, each analyst shall perform the audit analyses and all audit results shall be reported. Acceptance criteria for the audit results are the same as in Method 6.

5. *Calibration*

5.1 Metering System.

5.1.1 Initial Calibration. The initial calibration for the volume metering system is the same as for Method 6, Section 5.1.1.

5.1.2 Periodic Calibration Check. After 30 days of operation of the test train, conduct a calibration check as in Section 5.1.1 above, except for the following variations: (1) The leak check is not to be conducted, (2) three or more revolutions of the dry gas meter must be used, and (3) only two independent runs need be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor determined in Section 5.1.1, then the dry gas meter volumes obtained during the test series are acceptable and use of the train can continue. If the calibration factor deviates by more than 5 percent, recalibrate the metering system as in Section 5.1.1; and for the calculations for the preceding 30 days of data, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run. Use the latest calibration factor for succeeding tests.

5.2 Thermometers. Calibrate against mercury-in-glass thermometers initially and at 30-day intervals.

5.3 Rotameter. The rotameter need not be calibrated, but should be cleaned and maintained according to the manufacturer's instructions.

5.4 Barometer. Calibrate against a mercury barometer initially and at 30-day intervals.

5.5 Barium Perchlorate Solution. Standardize the barium perchlorate solution against 25 ml of standard sulfuric acid to which 100 ml of 100 percent isopropanol has been added.

6. *Calculations*

The nomenclature and calculation procedures are the same as in Method 6A with the following exceptions:

P_{bar}=Initial barometric pressure for the test period, mm Hg.

T_m=Absolute meter temperature for the test period, °K.

7. *Emission Rate Procedure*

The emission rate procedure is the same as described in Method 6A, Section 7, except that the timer is needed and is operated as described in this method. Only when this method is used for compliance determinations, perform the QA audit analyses as described in Section 4.4.

8. *Bibliography*

The bibliography is the same as described in Method 6A, with the addition of the following:

1. Butler, Frank E; J.E. Knoll, J.C. Suggs, M.R. Midgett, and W. Mason. The Collaborative Test of Method 6B: Twenty-Four-Hour Analysis of SO_2 and CO_2. JAPCA. Vol. 33, No. 10. October 1983.

METHOD 6C—DETERMINATION OF SULFUR DIOXIDE EMISSIONS FROM STATIONARY SOURCES (INSTRUMENTAL ANALYZER PROCEDURE)

1. *Applicability and Principle*

1.1 *Applicability.* This method is applicable to the determination of sulfur dioxide (SO_2) concentrations in controlled and uncontrolled emissions from stationary sources only when specified within the regulations.

1.2 Principle. A gas sample is continuously extracted from a stack, and a portion of the sample is conveyed to an instrumental analyzer for determination of SO_2 gas concentration using an ultraviolet (UV), nondispersive infrared (NDIR), or fluorescence analyzer. Performance specifications and test procedures are provided to ensure reliable data.

2. *Range and Sensitivity*

2.1 Analytical Range. The analytical range is determined by the instrumental design. For this method, a portion of the analytical range is selected by choosing the span of the monitoring system. The span of the monitoring system shall be selected such that the pollutant gas concentration equivalent to the emission standard is not less than 30 percent of the span. If at any time during a run the measured gas concentration exceeds the span, the run shall be considered invalid.

2.2 Sensitivity. The minimum detectable limit depends on the analytical range, span, and signal-to-noise ratio of the measurement system. For a well designed system, the min-

is shown in Figure 6C–3). Each of the individual SO_2 analytical results for each calibration gas shall be within 5 percent (or 5 ppm, whichever is greater) of the triplicate set average; otherwise, discard the entire set, and repeat the triplicate analyses. If the average of the triplicate analyses is within 5 percent of the calibration gas manufacturer's cylinder tag value, use the tag value; otherwise, conduct at least three additional analyses until the results of six consecutive runs agree with 5 percent (or 5 ppm, whichever is greater) of their average. Then use this average for the cylinder value.

6.2 Measurement System Preparation. Assemble the measurement system by following the manufacturer's written instructions for preparing and preconditioning the gas analyzer and, as applicable, the other system components. Introduce the calibration gases in any sequence, and make all necessary adjustments to calibrate the analyzer and the data recorder. Adjust system components to achieve correct sampling rates.

6.3 Analyzer Calibration Error. Conduct the analyzer calibration error check by introducing calibration gases to the measurement system at any point upstream of the gas analyzer as follows:

6.3.1 After the measurement system has been prepared for use, introduce the zero, mid-range, and high-range gases to the analyzer. During this check, make no adjustments to the system except those necessary to achieve the correct calibration gas flow rate at the analyzer. Record the analyzer responses to each calibration gas on a form similar to Figure 6C–4.

NOTE: A calibration curve established prior to the analyzer calibration error check may be used to convert the analyzer response to the equivalent gas concentration introduced to the analyzer. However, the same correction procedure shall be used for all effluent and calibration measurements obtained during the test.

6.3.2 The analyzer calibration error check shall be considered invalid if the gas concentration displayed by the analyzer exceeds ±2 percent of the span for any of the calibration gases. If an invalid calibration is exhibited, take corrective action, and repeat the analyzer calibration error check until acceptable performance is achieved.

6.4 Sampling System Bias Check. Perform the sampling system bias check by introducing calibration gases at the calibration valve installed at the outlet of the sampling probe. A zero gas and either the mid-range or high-range gas, whichever most closely approximates the effluent concentrations, shall be used for this check as follows:

6.4.1 Introduce the upscale calibration gas, and record the gas concentration displayed by the analyzer on a form similar to Figure 6C–5. Then introduce zero gas, and record the gas concentration displayed by the analyzer. During the sampling system bias check, operate the system at the normal sampling rate, and make no adjustments to the measurement system other than those necessary to achieve proper calibration gas flow rates at the analyzer. Alternately introduce the zero and upscale gases until a stable response is achieved. The tester shall determine the measurement system response time by observing the times required to achieve a stable response for both the zero and upscale gases. Note the longer of the two times as the response time.

6.4.2 The sampling system bias check shall be considered invalid if the difference between the gas concentrations displayed by the measurement system for the analyzer calibration error check and for the sampling system bias check exceeds ±5 percent of the span for either the zero or upscale calibration gas. If an invalid calibration is exhibited, take corrective action, and repeat the sampling system bias check until acceptable performance is achieved. If adjustment to the analyzer is required, first repeat the analyzer calibration error check, then repeat the sampling system bias check.

7. *Emission Test Procedure*

7.1 Selection of Sampling Site and Sampling Points. Select a measurement site and sampling points using the same criteria that are applicable to Method 6.

7.2 Interference Check Preparation. For each individual analyzer, conduct an interference check for at least three runs during the initial field test on a particular source category. Retain the results, and report them with each test performed on that source category.

If an interference check is being performed, assemble the modified Method 6 train (flow control valve, two midget impingers containing 3 percent H_2O_2, and dry gas meter) as shown in Figure 6C–2. Install the sampling train to obtain a sample at the measurement system sample by-pass discharge vent. Record the initial dry gas meter reading.

7.3 Sample Collection. Position the sampling probe at the first measurement point, and begin sampling at the same rate as used during the sampling system bias check. Maintain constant rate sampling (i.e., ±10 percent) during the entire run. The sampling time per run shall be the same as for Method 6 plus twice the system response time. For each run, use only those measurements obtained after twice response time of the measurement system has elapsed, to determine the average effluent concentration. If an interference check is being performed, open the flow control valve on the modified Method 6 train concurrent with the initiation of the sampling period, and adjust the flow to 1 liter per minute (±10 percent).

(NOTE: If a pump is not used in the modified Method 6 train, caution should be exercised in adjusting the flow rate since overpressurization of the impingers may cause leakage in the impinger train, resulting in positively biased results).

7.4 Zero and Calibration Drift Tests. Immediately preceding and following each run, or if adjustments are necessary for the measurement system during the run, repeat the sampling system bias check procedure described in Section 6.4 (Make no adjustments to the measurement system until after the drift checks are completed.) Record and analyzer's responses on a form similar to Figure 6C–5.

7.4.1 If either the zero or upscale calibration value exceeds the sampling system bias specification, then the run is considered invalid. Repeat both the analyzer calibration error check procedure (Section 6.3) and the sampling system bias check procedure (Section 6.4) before repeating the run.

7.4.2 If both the zero and upscale calibration values are within the sampling system bias specification, then use the average of the initial and final bias check values to calculate the gas concentration for the run. If the zero or upscale calibration drift value exceeds the drift limits, based on the difference between the sampling system bias check responses immediately before and after the run, repeat both the analyzer calibration error check procedure (Section 6.3) and the sampling system bias check procedure (Section 6.4) before conducting additional runs.

7.5 Interference Check (if performed). After completing the run, record the final dry gas meter reading, meter temperature, and barometric pressure. Recover and analyze the contents of the midget impingers, and determine the SO_2 gas concentration using the procedures of Method 6. (It is not necessary to analyze EPA performance audit samples for Method 6.) Determine the average gas concentration exhibited by the analyzer for the run. If the gas concentrations provided by the analyzer and the modified Method 6 differ by more than 7 percent of the modified Method 6 result, the run is invalidated.

8. *Emission Calculation*

The average gas effluent concentration is determined from the average gas concentration displayed by the gas analyzer, and is adjusted for the zero and upscale sampling system bias checks, as determined in accordance with Section 7.4. The average gas concentration displayed by the analyzer may be determined by integration of the area under the curve for chart recorders, or by averaging all of the effluent measurements. Alternatively, the average may be calculated from measurements recorded at equally spaced intervals over the entire duration of the run. For sampling run durations of less than 1 hour, measurements at 1-minute intervals or a minimum of 30 measurements, whichever is less restrictive, shall be used. For sampling run durations greater than 1 hour, measurements at 2-minute intervals or a minimum of 96 measurements, whichever is less restrictive, shall be used. Calculate the effluent gas concentration using Equation 6C–1.

$$C_{gas} = (\bar{C} - C_o)\frac{C_{ma}}{C_m - C_o}$$

Eq. 6C–1

Where:

C_{gas} = Effluent gas concentration, dry basis, ppm.

$\bar{C}$ = Average gas concentration indicated by gas analyzer, dry basis, ppm.

C_o = Average of initial and final system calibration bias check responses for the zero gas, ppm.

C_m = Average of initial and final system calibration bias check responses for the upscale calibration gas, ppm.

C_{ma} = Actual concentration of the upscale calibration gas, ppm.

9. *Bibliography*

1. Traceability Protocol for Establishing True Concentrations of Gases Used for Calibrations and Audits of Continuous Source Emission Monitors: Protocol Number 1. U.S. Environmental Protection Agency, Quality Assurance Division. Research Triangle Park, NC. June 1978.

2. Westlin, Peter R. and J. W. Brown. Methods for Collecting and Analyzing Gas Cylinder Samples. Source Evaluation Society Newsletter. 3(3):5–15. September 1978.

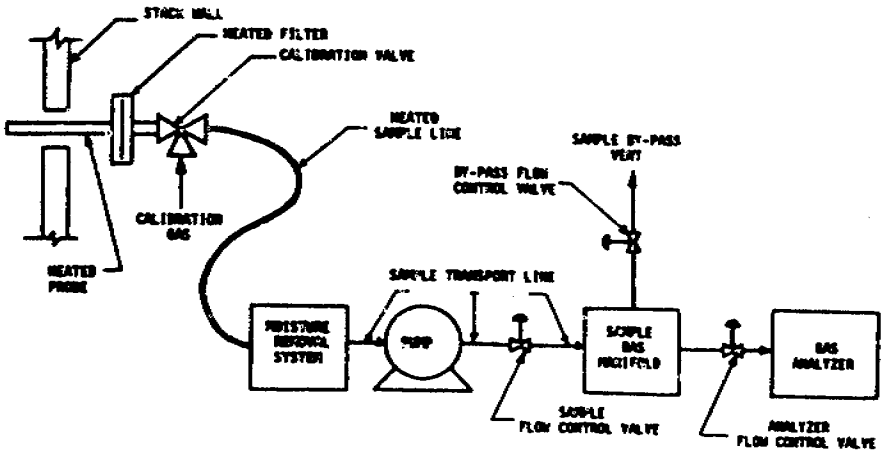

Figure 6C-1. Measurement system schematic.

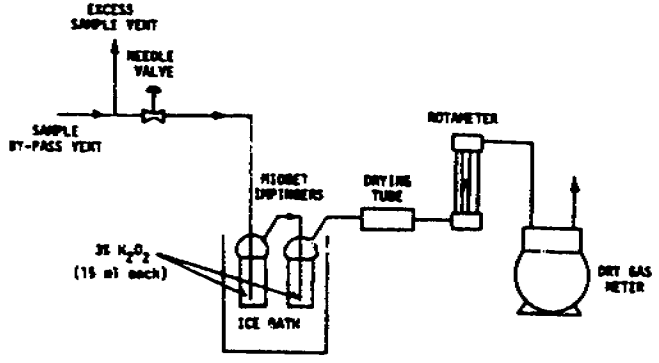

Figure 6C-2. Interference check sampling train.

FIGURE 6C–3—ANALYSIS OF CALIBRATION GASES

Date _____
Analytic method used _____

	Gas concentration (indicate units)		
	Zero[a]	Mid-range[b]	High-range[c]
Sample run:			
1			
2			
3			
Average			
Maximum percent deviation			

[a] Average must be less than 0.25 percent of span.
[b] Average must be 50 to 60 percent of span.
[c] Average must be 80 to 90 percent of span.

FIGURE 6C–4—ANALYZER CALIBRATION DATA

Source identification: _____ Analyzer calibration data for sampling runs: _____
Test personnel: _____ Span: _____
Date: _____

	Cylinder value (indicate units)	Analyzer calibration response (indicate units)	Absolute difference (indicate units)	Difference (percent of span)
Zero gas				
Mid-range gas				
High-range gas				

FIGURE 6C–5—SYSTEM CALIBRATION BIAS AND DRIFT DATA

Source identification: _____ Date: _____
Test personnel: _____ Run number: _____
Span: _____

	Analyzer calibration response	Initial values		Final values		Drift (percent of span)
		System calibration response	System cal. bias (percent of span)	System calibration response	System cal. bias (percent of span)	
Zero gas						
Upscale gas						

$$\text{System Calibration Bias} = \frac{\text{System Cal. Response-Analyzer Cal. Response}}{\text{Span}} \times 100$$

$$\text{Drift} = \frac{\text{Final System Cal. Response-Initial System Cal. Response}}{\text{Span}} \times 100$$

Method 25 is not needed for sample analysis. Complete Method 25 analytical systems are acceptable alternatives when calibrated for CO and operated by the Method 25 analytical procedures.

NOTE: Mention of trade names or commercial products in this method does not constitute the endorsement or recommendation for use by the Environmental Protection Agency.

1.3 Interferences. Carbon dioxide (CO_2) and organics potentially can interfere with the analysis. Carbon dioxide is primarily removed from the sample by the alkaline permanganate conditioning system; any residual CO_2 and organics are separated from the CO by GC.

2. Apparatus

2.1 Sampling. Same as in Method 10A, section 2.1.

2.2 Analysis.

2.2.1 Gas Chromatographic (GC) Analyzer. A semicontinuous GC/FID analyzer capable of quantifying CO in the sample and containing at least the following major components.

2.2.1.1 Separation Column. A column that separates CO from CO_2 and organic compounds that may be present. A ⅛-in. OD stainless-steel column packed with 5.5 ft of 60/80 mesh Carbosieve S–II (available from Supelco) has been used successfully for this purpose. The column listed in Addendum 1 of Method 25 is also acceptable.

2.2.1.2 Reduction Catalyst. Same as in Method 25, section 2.3.2.

2.2.1.3 Sample Injection System. Same as in Method 25, section 2.3.4, equipped to accept a sample line from the Tedlar bag.

2.2.1.4 Flame Ionization Detector. Linearity meeting the specifications in section 2.3.5.1 of Method 25 where the linearity check is carried out using standard gases containing 20–, 200–, and 1,000–ppm CO. The minimal instrument range shall span 10 to 1,000 ppm CO.

2.2.1.5 Data Recording System. Same as in Method 25, section 2.3.6.

3. Reagents

3.1 Sampling. Same as in Method 10A, section 3.1.

3.2 Analysis.

3.2.1 Carrier, Fuel, and Combustion Gases. Same as in Method 25, sections 3.2.1, 3.2.2, and 3.2.3.

3.2.2 Linearity and Calibration Gases. Three standard gases with nominal CO concentrations of 20–, 200–, and 1,000–ppm CO in nitrogen.

3.2.3 Reduction Catalyst Efficiency Check Calibration Gas. Standard CH_4 gas with a concentration of 1,000 ppm in air.

4. Procedure

4.1 Sample Bag Leak-checks, Sampling, and CO_2 Measurement. Same as in Method 10A, sections 4.1, 4.2, and 4.3.

4.2 Preparation for Analysis. Before putting the GC analyzer into routine operation, conduct the calibration procedures listed in section 5. Establish an appropriate carrier flow rate and detector temperature for the specific instrument used.

4.3 Sample Analysis. Purge the sample loop with sample, and then inject the sample. Analyze each sample in triplicate, and calculate the average sample area (A). Determine the bag CO concentration according to section 6.2.

5. Calibration

5.1 Carrier Gas Blank Check. Analyze each new tank of carrier gas with the GC analyzer according to section 4.3 to check for contamination. The corresponding concentration must be less than 5 ppm for the tank to be acceptable for use.

5.2 Reduction Catalyst Efficiency Check. Prior to initial use, the reduction catalyst shall be tested for reduction efficiency. With the heated reduction catalyst bypassed, make triplicate injections of the 1,000-ppm CH_4 gas (section 3.2.3) to calibrate the analyzer. Repeat the procedure using 1,000-ppm CO (section 3.2.2) with the catalyst in operation. The reduction catalyst operation is acceptable if the CO response is within 5 percent of the certified gas value.

5.3 Analyzer Linearity Check and Calibration. Perform this test before the system is first placed into operation. With the reduction catalyst in operation, conduct a linearity check of the analyzer using the standards specified in section 3.2.2. Make triplicate injections of each calibration gas, and then calculate the average response factor (area/ppm) for each gas, as well as the overall mean of the response factor values. The instrument linearity is acceptable if the average response factor of each calibration gas is within 2.5 percent of the overall mean value and if the relative standard deviation (calculated in section 6.9 of Method 25) for each set of triplicate injections is less than 2 percent. Record the overall mean of the response factor values as the calibration response factor (R).

6. Calculations

Carry out calculations retaining at least one extra decimal figure beyond that of the acquired data. Round off results only after the final calculation.

6.1 Nomenclature.

A=Average sample area.

B_w=Moisture content in the bag sample, fraction.

C=CO concentration in the stack gas, dry basis, ppm.

C_b=CO concentration in the bag sample, dry basis, ppm.

F=Volume fraction of CO_2 in the stack, fraction.

P_{bar}=Barometric pressure, mm Hg.

P_w=Vapor pressure H_2O in the bag (from Table 10–2, Method 10A), mm Hg.

R=Mean calibration response factor, area/ppm.

6.2 CO Concentration in the Bag. Calculate C_b using Equations 10B–1 and 10B–2. If condensate is visible in the Tedlar bag, calculate B_w using Table 10A–1 of Method 10A and the temperature and barometric pressure in the analysis room. If condensate is not visible, calculate B_w using the temperature and barometric pressure at the sampling site.

$$B_w = \frac{P_w}{P_{bar}}$$

Eq. 10B–1

$$C_b = \frac{A}{R(1-B_w)}$$

Eq. 10B–2

6.3 CO Concentration in the Stack.

$C=C_b(1-F)$

Eq. 10B–3

7. Bibliography

1. Butler, F.E, J.E. Knoll, and M.R. Midgett. Development and Evaluation of Methods for Determining Carbon Monoxide Emissions. Quality Assurance Division, Environmental Monitoring Systems Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711. June 1985. 33p.

2. Salo, A.E., S. Witz, and R.D. MacPhee. Determination of Solvent Vapor Concentrations by Total Combustion Analysis: A Comparison of Infrared with Flame Ionization Detectors. Paper No. 75–33.2. (Presented at the 68th Annual Meeting of the Air Pollution Control Association. Boston, MA. June 15, 1975.) 14 p.

3. Salo, A.E., W.L. Oaks, and R.D. MacPhee. Measuring the Organic Carbon Content of Source Emissions for Air Pollution Control. Paper No. 74–190. (Presented at the 67th Annual Meeting of the Air Pollution Control Association. Denver, CO. June 9, 1974.) 25 p.

METHOD 11—DETERMINATION OF HYDROGEN SULFIDE CONTENT OF FUEL GAS STREAMS IN PETROLEUM REFINERIES

1. Principle and Applicability

1.1 Principle. Hydrogen sulfide (H_2S) is collected from a source in a series of midget impingers and absorbed in pH 3.0 cadmium sulfate ($CdSO_4$) solution to form cadmium sulfide (CdS). The latter compound is then measured iodometrically. An impinger containing hydrogen peroxide is included to remove SO_2 as an interfering species. This method is a revision of the H_2S method originally published in the FEDERAL REGISTER, Volume 39, No. 47, dated Friday, March 8, 1974.

1.2 Applicability. This method is applicable for the determination of the hydrogen sulfide content of fuel gas streams at petroleum refineries.

2. Range and Sensitivity

The lower limit of detection is approximately 8 mg/m³ (6 ppm). The maximum of the range is 740 mg/m³ (520 ppm).

3. Interferences

Any compound that reduces iodine or oxidizes iodide ion will interfere in this procedure, provided it is collected in the cadmium sulfate impingers. Sulfur dioxide in concentrations of up to 2,600 mg/m³ is eliminated by the hydrogen peroxide solution. Thiols precipitate with hydrogen sulfide. In the absence of H_2S, only co-traces of thiols are collected. When methane- and ethanethiols at a total level of 300 mg/m³ are present in addition to H_2S, the results vary from 2 percent low at an H_2S concentration of 400 mg/m³ to 14 percent high at an H_2S concentration of 100 mg/m³. Carbon oxysulfide at a concentration of 20 percent does not interfere. Certain carbonyl-containing compounds react with iodine and produce recurring end points. However, acetaldehyde and acetone at concentrations of 1 and 3 percent, respectively, do not interfere.

Entrained hydrogen peroxide produces a negative interference equivalent to 100 percent of that of an equimolar quantity of hydrogen sulfide. Avoid the ejection of hydrogen peroxide into the cadmium sulfate impingers.

4. Precision and Accuracy

Collaborative testing has shown the within-laboratory coefficient of variation to be 2.2 percent and the overall coefficient of variation to be 5 percent. The method bias was shown to be −4.8 percent when only H_2S was present. In the presence of the interferences cited in section 3, the bias was positive at low H_2S concentration and negative at higher concentrations. At 230 mg H_2S/m^3, the level of the compliance standard, the bias was +2.7 percent. Thiols had no effect on the precision.

5. Apparatus

5.1 Sampling Apparatus.

5.1.1 Sampling Line. Six to 7 mm (¼ in.) Teflon[1] tubing to connect the sampling train to the sampling valve.

5.1.2 Impingers. Five midget impingers, each with 30 ml capacity. The internal diameter of the impinger tip must be 1 mm ±0.05 mm. The impinger tip must be positioned 4 to 6 mm from the bottom of the impinger.

5.1.3 Tubing. Glass or Teflon connecting tubing for the impingers.

5.1.4 Ice Bath Container. To maintain absorbing solution at a low temperature.

5.1.5 Drying Tube. Tube packed with 6- to 16-mesh indicating-type silica gel, or equivalent, to dry the gas sample and protect the meter and pump. If the silica gel has been used previously, dry at 175° C (350° F) for 2 hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to approval of the Administrator.

NOTE: Do not use more than 30 g of silica gel. Silica gel absorbs gases such as propane from the fuel gas stream, and use of excessive amounts of silica gel could result in errors in the determination of sample volume.

5.1.6 Sampling Valve. Needle valve or equivalent to adjust gas flow rate. Stainless steel or other corrosion-resistant material.

5.1.7 Volume Meter. Dry gas meter, sufficiently accurate to measure the sample volume within 2 percent, calibrated at the selected flow rate (~1.0 liter/min) and conditions actually encountered during sampling. The meter shall be equipped with a temperature gauge (dial thermometer or equivalent) capable of measuring temperature to within 3° C (5.4° F). The gas meter should have a petcock, or equivalent, on the outlet connector which can be closed during the leak check. Gas volume for one revolution of the meter must not be more than 10 liters.

5.1.8 Flow Meter. Rotameter or equivalent, to measure flow rates in the range from 0.5 to 2 liters/min (1 to 4 cfh).

5.1.9 Graduated Cylinder, 25 ml size.

5.1.10 Barometer. Mercury, aneroid, or other barometer capable of measuring atmospheric pressure to within 2.5 mm Hg (0.1 in. Hg). In many cases, the barometric reading may be obtained from a nearby National Weather Service station, in which case, the station value (which is the absolute barometric pressure) shall be requested and an adjustment for elevation differences between the weather station and the sampling point shall be applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 30 m (100 ft) elevation increase or vice-versa for elevation decrease.

5.1.11 U-tube Manometer. 0–30 cm water column. For leak check procedure.

5.1.12 Rubber Squeeze Bulb. To pressurize train for leak check.

5.1.13 Tee, Pinchclamp, and Connecting Tubing. For leak check.

5.1.14 Pump. Diaphragm pump, or equivalent. Insert a small surge tank between the pump and rate meter to eliminate the pulsation effect of the diaphragm pump on the rotameter. The pump is used for the air purge at the end of the sample run; the pump is not ordinarily used during sampling, because fuel gas streams are usually sufficiently pressurized to force sample gas through the train at the required flow rate. The pump need not be leak-free unless it is used for sampling.

5.1.15 Needle Valve or Critical Orifice. To set air purge flow to 1 liter/min.

5.1.16 Tube Packed With Active Carbon. To filter air during purge.

5.1.17 Volumetric Flask. One 1,000 ml.

5.1.18 Volumetric Pipette. One 15 ml.

5.1.19 Pressure-Reduction Regulator. Depending on the sampling stream pressure, a pressure-reduction regulator may be needed to reduce the pressure of the gas stream entering the Teflon sample line to a safe level.

5.1.20 Cold Trap. If condensed water or amine is present in the sample stream, a corrosion-resistant cold trap shall be used immediately after the sample tap. The trap shall not be operated below 0° C (32° F) to avoid condensation of C_3 or C_4 hydrocarbons.

5.2 Sample Recovery.

5.2.1 Sample Container. Iodine flask, glass-stoppered: 500 ml size.

5.2.2 Pipette. 50 ml volumetric type.

5.2.3 Graduated Cylinders. One each 25 and 250 ml.

5.2.4 Flasks. 125 ml, Erlenmeyer.

5.2.5 Wash Bottle.

5.2.6 Volumetric Flasks. Three 1,000 ml.

5.3 Analysis.

5.3.1 Flask. 500 ml glass-stoppered iodine flask.

5.3.2 Burette. 50 ml.

5.3.3 Flask. 125 ml, Erlenmeyer.

5.3.4 Pipettes, Volumetric. One 25 ml; two each 50 and 100 ml.

5.3.5 Volumetric Flasks. One 1,000 ml; two 500 ml.

5.3.6 Graduated Cylinders. One each 10 and 100 ml.

6. *Reagents*

Unless otherwise indicated, it is intended that all reagents conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Otherwise, use best available grade.

6.1 Sampling.

6.1.1 Cadmium Sulfate Absorbing Solution. Dissolve 41 g of $3CdSO_4 \cdot 8H_2O$ and 15 ml of 0.1 M sulfuric acid in a 1-liter volumetric flask that contains approximately ¾ liter of deionized distilled water. Dilute to volume with deionized water. Mix thoroughly. pH should be 3±0.1. Add 10 drops of Dow-Corning Antifoam B. Shake well before use. If Antifoam B is not used, the alternative acidified iodine extraction procedure (Section 7.2.2) must be used.

6.1.2 Hydrogen Peroxide, 3 Percent. Dilute 30 percent hydrogen peroxide to 3 percent as needed. Prepare fresh daily.

6.1.3 Water. Deionized, distilled to conform to ASTM specifications D1193–72, Type 3. At the option of the analyst, the $KMnO_4$ test for oxidizable organic matter may be omitted when high concentrations of organic matter are not expected to be present.

6.2 Sample Recovery.

6.2.1 Hydrochloric Acid Solution (HCl), 3M. Add 240 ml of concentrated HCl (specific gravity 1.19) to 500 ml of deionized, distilled water in a 1-liter volumetric flask. Dilute to 1 liter with deionized water. Mix thoroughly.

6.2.2 Iodine Solution 0.1 N. Dissolve 24 g of potassium iodide (KI) in 30 ml of deionized, distilled water. Add 12.7 g of resublimed iodine (I_2) to the potassium iodide solution. Shake the mixture until the iodine is completely dissolved. If possible, let the solution stand overnight in the dark. Slowly dilute the solution to 1 liter with deionized, distilled water, with swirling. Filter the solution if it is cloudy. Store solution in a brown-glass reagent bottle.

6.2.3 Standard Iodine Solution, 0.01 N. Pipette 100.0 ml of the 0.1 N iodine solution into a 1-liter volumetric flask and dilute to volume with deionized, distilled water. Standardize daily as in Section 8.1.1. This solution must be protected from light. Reagent bottles and flasks must be kept tightly stoppered.

6.3 Analysis.

6.3.1 Sodium Thiosulfate Solution, Standard 0.1 N. Dissolve 24.8 g of sodium thiosulfate pentahydrate ($Na_2S_2O_3 \cdot 5H_2O$) or 15.8 g of anhydrous sodium thiosulfate ($Na_2S_2O_3$) in 1 liter of deionized, distilled water and add 0.01 g of anhydrous sodium carbonate (Na_2CO_3) and 0.4 ml of chloroform ($CHCl_3$) to stabilize. Mix thoroughly by shaking or by aerating with nitrogen for approximately 15 minutes and store in a glass-stoppered, reagent bottle. Standardize as in Section 8.1.2.

6.3.2 Sodium Thiosulfate Solution, Standard 0.01 N. Pipette 50.0 ml of the standard 0.1 N thiosulfate solution into a volumetric flask and dilute to 500 ml with distilled water.

NOTE: A 0.01 N phenylarsine oxide solution may be prepared instead of 0.01 N thiosulfate (see Section 6.3.3).

6.3.3 Phenylarsine Oxide Solution, Standard 0.01 N. Dissolve 1.80 g of phenylarsine oxide (C_6H_5AsO) in 150 ml of 0.3 N sodium hydroxide. After settling, decant 140 ml of this solution into 800 ml of distilled water. Bring the solution to pH 6–7 with 6N hydrochloric acid and dilute to 1 liter. Standardize as in Section 8.1.3.

6.3.4 Starch Indicator Solution. Suspend 10 g of soluble starch in 100 ml of deionized, distilled water and add 15 g of potassium hydroxide (KOH) pellets. Stir until dissolved, dilute with 900 ml of deionized distilled water and let stand for 1 hour. Neutralize the alkali with concentrated hydrochloric acid, using an indicator paper similar to Alkacid test ribbon, then add 2 ml of glacial acetic acid as a preservative.

NOTE: Test starch indicator solution for decomposition by titrating, with 0.01 N iodine solution, 4 ml of starch solution in 200 ml of distilled water that contains 1 g potassium iodide. If more than 4 drops of the 0.01 N iodine solution are required to obtain the blue color, a fresh solution must be prepared.

7. *Procedure*

7.1 Sampling.

7.1.1 Assemble the sampling train as shown in Figure 11–1, connecting the five midget impingers in series. Place 15 ml of 3 percent hydrogen peroxide solution in the first impinger. Leave the second impinger empty. Place 15 ml of the cadmium sulfate absorbing solution in the third, fourth, and fifth impingers. Place the impinger assembly in an ice bath container and place crushed ice around the impingers. Add more ice during the run, if needed.

7.1.2 Connect the rubber bulb and manometer to first impinger, as shown in Figure 11–1. Close the petcock on the dry gas meter outlet. Pressurize the train to 25-cm water pressure with the bulb and close off tubing connected to rubber bulb. The train must hold a 25-cm water pressure with not more than a 1-cm drop in pressure in a 1-minute interval. Stopcock grease is acceptable for sealing ground glass joints.

NOTE: This leak check procedure is optional at the beginning of the sample run, but is mandatory at the conclusion. Note also that if the pump is used for sampling, it is recommended (but not required) that the pump be leak-checked separately, using a method consistent with the leak-check procedure for diaphragm pumps outlined in Section 4.1.2 of Method 6, 40 CFR part 60, appendix A.

7.1.3 Purge the connecting line between the sampling valve and first impinger, by disconnecting the line from the first impinger, opening the sampling valve, and allowing process gas to flow through the line for a minute or two. Then, close the sampling valve and reconnect the line to the impinger train. Open the petcock on the dry gas meter outlet. Record the initial dry gas meter reading.

[1] Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

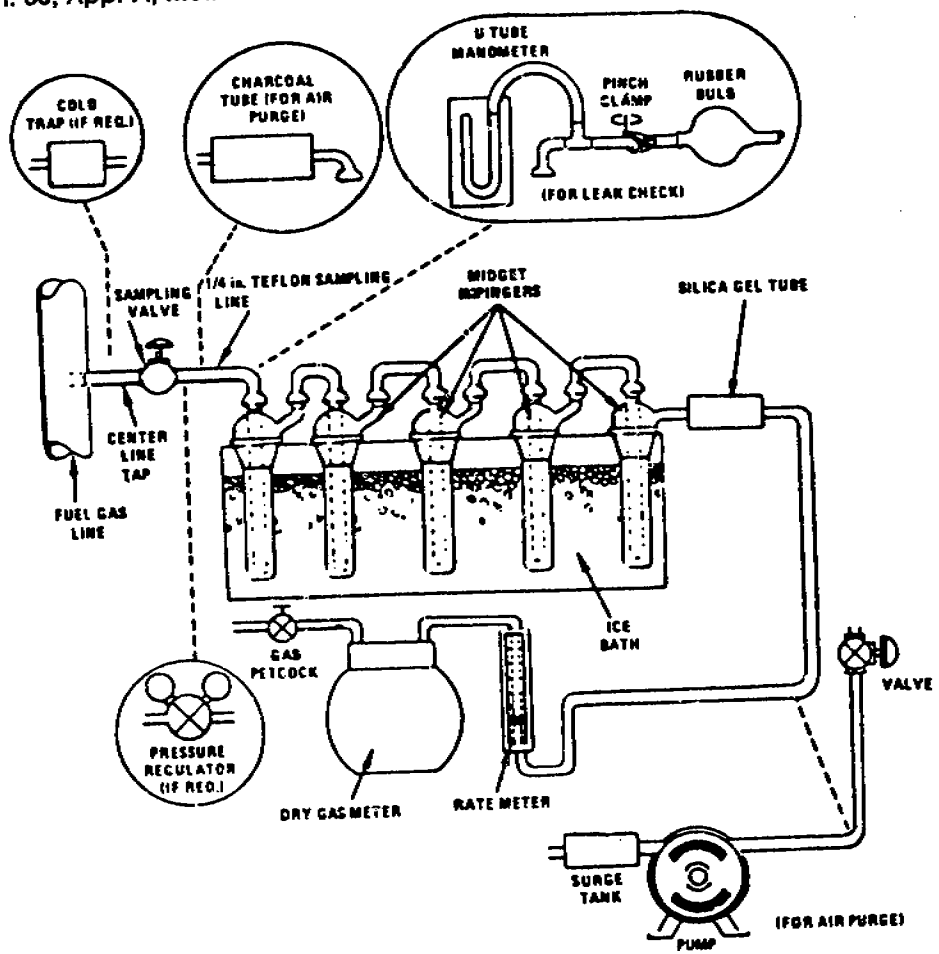

Figure 11-1. H_2S sampling train.

7.1.4 Open the sampling valve and then adjust the valve to obtain a rate of approximately 1 liter/min. Maintain a constant (±10 percent) flow rate during the test. Record the meter temperature.

7.1.5 Sample for at least 10 min. At the end of the sampling time, close the sampling valve and record the final volume and temperature readings. Conduct a leak check as described in Section 7.1.2 above.

7.1.6 Disconnect the impinger train from the sampling line. Connect the charcoal tube and the pump, as shown in Figure 11-1. Purge the train (at a rate of 1 liter/min) with clean ambient air for 15 minutes to ensure that all H_2S is removed from the hydrogen peroxide. For sample recovery, cap the open ends and remove the impinger train to a clean area that is away from sources of heat. The area should be well lighted, but not exposed to direct sunlight.

7.2 Sample Recovery.

7.2.1 Discard the contents of the hydrogen peroxide impinger. Carefully rinse the contents of the third, fourth, and fifth impingers into a 500 ml iodine flask.

NOTE: The impingers normally have only a thin film of cadmium sulfide remaining after a water rinse. If Antifoam B was not used or if significant quantities of yellow cadmium sulfide remain in the impingers, the alternative recovery procedure described below must be used.

7.2.2 Pipette exactly 50 ml of 0.01 N iodine solution into a 125 ml Erlenmeyer flask. Add 10 ml of 3 M HCl to the solution. Quantitatively rinse the acidified iodine into the iodine flask. Stopper the flask immediately and shake briefly.

7.2.2 (Alternative). Extract the remaining cadmium sulfide from the third, fourth, and fifth impingers using the acidified iodine solution. Immediately after pouring the acidified iodine into an impinger, stopper it and shake for a few moments, then transfer the liquid to the iodine flask. Do not transfer any rinse portion from one impinger to another; transfer it directly to the iodine flask. Once the acidified iodine solution has been poured into any glassware containing cadmium sulfide, the container must be tightly stoppered at all times except when adding more solution, and this must be done as quickly and carefully as possible. After adding any acidified iodine solution to the iodine flask, allow a few minutes for absorption of the H_2S before adding any further rinses. Repeat the iodine extraction until all cadmium sulfide is removed from the impingers. Extract that part of the connecting glassware that contains visible cadmium sulfide.

Quantitatively rinse all of the iodine from the impingers, connectors, and the beaker into the iodine flask using deionized, distilled water. Stopper the flask and shake briefly.

7.2.3 Allow the iodine flask to stand about 30 minutes in the dark for absorption of the H_2S into the iodine, then complete the titration analysis as in Section 7.3.

NOTE: Caution! Iodine evaporates from acidified iodine solutions. Samples to which acidified iodine have been added may not be stored, but must be analyzed in the time schedule stated in Section 7.2.3.

7.2.4 Prepare a blank by adding 45 ml of cadmium sulfate absorbing solution to an iodine flask. Pipette exactly 50 ml of 0.01 N iodine solution into a 125-ml Erlenmeyer flask. Add 10 ml of 3 M HCl. Follow the same impinger extracting and quantitative rinsing procedure carried out in sample analysis. Stopper the flask, shake briefly, let stand 30 minutes in the dark, and titrate with the samples.

NOTE: The blank must be handled by exactly the same procedure as that used for the samples.

7.3 Analysis.

NOTE: Titration analyses should be conducted at the sample-cleanup area in order to prevent loss of iodine from the sample. Titration should never be made in direct sunlight.

7.3.1 Using 0.01 N sodium thiosulfate solution (or 0.01 N phenylarsine oxide, if applicable), rapidly titrate each sample in an iodine flask using gentle mixing, until solution is light yellow. Add 4 ml of starch indicator solution and continue titrating slowly until the blue color just disappears. Record V_{TT}, the volume of sodium thiosulfate solution used, or V_{AT}, the volume of phenylarsine oxide solution used (ml).

7.3.2 Titrate the blanks in the same manner as the samples. Run blanks each day until replicate values agree within 0.05 ml. Average the replicate titration values which agree within 0.05 ml.

8. *Calibration and Standards*

8.1 Standardizations.

8.1.1 Standardize the 0.01 N iodine solution daily as follows: Pipette 25 ml of the iodine solution into a 125 ml Erlenmeyer flask. Add 2 ml of 3 M HCl. Titrate rapidly with standard 0.01 N thiosulfate solution or with 0.01 N phenylarsine oxide until the solution is light yellow, using gentle mixing. Add four drops of starch indicator solution and continue titrating slowly until the blue color just disappears. Record V_T, the volume of thiosulfate solution used, or V_{AS}, the volume of phenylarsine oxide solution used (ml). Repeat until replicate values agree within 0.05 ml. Average the replicate titration values which agree within 0.05 ml and calculate the exact normality of the iodine solution using Equation 11-3. Repeat the standardization daily.

8.1.2 Standardize the 0.1 N thiosulfate solution as follows: Oven-dry potassium dichromate ($K_2Cr_2O_7$) at 180 to 200° C (360 to 390° F). Weigh to the nearest milligram, 2 g of potassium dichromate. Transfer the dichromate to a 500 ml volumetric flask, dissolve in deionized, distilled water and dilute to exactly 500 ml. In a 500 ml iodine flask, dissolve approximately 3 g of potassium iodide (KI) in 45 ml of deionized, distilled water, then add 10 ml of 3 M hydrochloric acid solution. Pipette 50 ml of the dichromate solution into this mixture. Gently swirl the solution once and allow it to stand in the dark for 5 minutes. Dilute the solution with 100 to 200 ml of deionized distilled water, washing down the sides of the flask with part of the water. Titrate with 0.1 N thiosulfate until the solution is light yellow. Add 4 ml of starch indicator and continue titrating slowly to a green end point. Record V_S, the volume of thiosulfate solution used (ml). Repeat until replicate analyses agree within 0.05 ml. Calculate the normality using Equation 11-1. Repeat the standardization

each week, or after each test series, whichever time is shorter.

8.1.3 Standardize the 0.01 N Phenylarsine oxide (if applicable) as follows: oven dry potassium dichromate ($K_2Cr_2O_7$) at 180 to 200° C (360 to 390° F). Weigh to the nearest milligram, 2 g of the $K_2Cr_2O_7$; transfer the dichromate to a 500 ml volumetric flask, dissolve in deionized, distilled water, and dilute to exactly 500 ml. In a 500 ml iodine flask, dissolve approximately 0.3 g of potassium iodide (KI) in 45 ml of deionized, distilled water; add 10 ml of 3M hydrochloric acid. Pipette 5 ml of the $K_2Cr_2O_7$ solution into the iodine flask. Gently swirl the contents of the flask once and allow to stand in the dark for 5 minutes. Dilute the solution with 100 to 200 ml of deionized, distilled water, washing down the sides of the flask with part of the water. Titrate with 0.01 N phenylarsine oxide until the solution is light yellow. Add 4 ml of starch indicator and continue titrating slowly to a green end point. Record V_A, the volume of phenylarsine oxide used (ml). Repeat until replicate analyses agree within 0.05 ml. Calculate the normality using Equation 11–2. Repeat the standardization each week or after each test series, whichever time is shorter.

8.2 Sampling Train Calibration. Calibrate the sampling train components as follows:

8.2.1 Dry Gas Meter.

8.2.1.1 Initial Calibration. The dry gas meter shall be calibrated before its initial use in the field. Proceed as follows: First, assemble the following components in series: Drying tube, needle valve, pump, rotameter, and dry gas meter. Then, leak-check the system as follows: Place a vacuum gauge (at least 760 mm Hg) at the inlet to the drying tube and pull a vacuum of 250 mm (10 in.) Hg; plug or pinch off the outlet of the flow meter, and then turn off the pump. The vacuum shall remain stable for at least 30 seconds. Carefully release the vacuum gauge before releasing the flow meter end.

Next, calibrate the dry gas meter (at the sampling flow rate specified by the method) as follows: Connect an appropriately sized wet test meter (e.g., 1 liter per revolution) to the inlet of the drying tube. Make three independent calibration runs, using at least five revolutions of the dry gas meter per run. Calculate the calibration factor, *Y* (wet test meter calibration volume divided by the dry gas meter volume, both volumes adjusted to the same reference temperature and pressure), for each run, and average the results. If any *Y* value deviates by more than 2 percent from the average, the dry gas meter is unacceptable for use. Otherwise, use the average as the calibration factor for subsequent test runs.

8.2.1.2 Post-test Calibration Check. After each field test series, conduct a calibration check as in Section 8.2.1.1. above, except for the following variations: (a) The leak check is not to be conducted, (b) three or more revolutions of the dry gas meter may be used, and (c) only two independent runs need be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in Section 8.2.1.1.), then the dry gas meter volumes obtained during the test series are acceptable. If the calibration factor deviates by more than 5 percent, recalibrate the dry gas meter as in Section 8.2.1.1, and for the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

8.2.2 Thermometers. Calibrate against mercury-in-glass thermometers.

8.2.3 Rotameter. The rotameter need not be calibrated, but should be cleaned and maintained according to the manufacturer's instruction.

8.2.4 Barometer. Calibrate against a mercury barometer.

9. *Calculations*

Carry out calculations retaining at least one extra decimal figure beyond that of the acquired data. Round off results only after the final calculation.

9.1 Normality of the Standard (~0.1 N) Thiosulfate Solution.

$$N_S = 2.039 W/V_S$$

Eq. 11-1

where:

W=Weight of $K_2Cr_2O_7$ used, g.
V_S=Volume of $Na_2S_2O_3$ solution used, ml.
N_S=Normality of standard thiosulfate solution, g-eq/liter.
2.039=Conversion factor

(6 eq. I_2/mole $K_2Cr_2O_7$) (1,000 ml/liter)/ (294.2 g $K_2Cr_2O_7$/mole) (10 aliquot factor)

9.2 Normality of Standard Phenylarsine Oxide Solution (if applicable).

$$N_A = 0.2039 W/V_A$$

Eq. 11-2

where:

W=Weight of $K_2Cr_2O_7$ used, g.
V_A=Volume of $C_6H_5A_sO$ used, ml.
N_A=Normality of standard phenylarsine oxide solution, g-eq/liter.
0.2039=Conversion factor

(6 eq. I_2/mole $K_2Cr_2O_7$) (1,000 ml/liter)/(249.2 g $K_2Cr_2O_7$/mole) (100 aliquot factor)

9.3 Normality of Standard Iodine Solution.

$$N_I = N_T V_T / V_I$$

11-3

where:

N_I=Normality of standard iodine solution, g-eq/liter.

V_I=Volume of standard iodine solution used, ml.
N_T=Normality of standard (~0.01 N) thiosulfate solution; assumed to be 0.1 N_S, g-eq/liter.
V_T=Volume of thiosulfate solution used, ml.

NOTE: If phenylarsine oxide is used instead of thiosulfate, replace N_T and V_T in Equation 11–3 with N_A and V_{AS}, respectively (see Sections 8.1.1 and 8.1.3).

9.4 Dry Gas Volume. Correct the sample volume measured by the dry gas meter to standard conditions (20° C and 760 mm Hg.)

$$V_{m(std)} = V_m Y [(T_{std}/T_m)(P_{bar}/P_{std})]$$

Eq. 11-4

Where:

$V_{m(std)}$=Volume at standard conditions of gas sample through the dry gas meter, standard liters.
V_m=Volume of gas sample through the dry gas meter (meter conditions), liters.
T_{std}=Absolute temperature at standard conditions, 293° K.
T_m=Average dry gas meter temperature, °K.
P_{bar}=Barometric pressure at the sampling site, mm Hg.
P_{std}=Absolute pressure at standard conditions, 760 mm Hg.
Y=Dry gas meter calibration factor.

9.5 Concentration of H_2S. Calculate the concentration of H_2S in the gas stream at standard conditions using the following equation:

$$C_{H2S} = K[(V_{TT}N_I - V_{TT}N_T)\ \text{sample} - (V_{IT}N_I - V_{TT}N_T)]/V_{m(std)}$$

Eq. 11-5

Where (metric units):

C_{H2S}=Concentration of H_2S at standard conditions, mg/dscm.
K=Conversion factor 17.04×10^3

(34.07 g/mole H_2S) (1,000 liters/m^3) (1,000 mg/g)/(1,000 ml/liter) ($2H_2S$ eq/mole)

V_{IT}=Volume of standard iodine solution=50.0 ml.
N_I=Normality of standard iodine solution, g-eq/liter.
V_{TT}=Volume of standard (~0.01 N) sodium thiosulfate solution, ml.
N_T=Normality of standard sodium thiosulfate solution, g-eq/liter.
$V_{m(std)}$=Dry gas volume at standard conditions, liters.

NOTE: If phenylarsine oxide is used instead of thiosulfate, replace N_T and V_{TT} in Equation 11–5 with N_A and V_{AT}, respectively (see Sections 7.3.1 and 8.1.3).

10. *Stability*

The absorbing solution is stable for at least 1 month. Sample recovery and analysis should begin within 1 hour of sampling to minimize oxidation of the acidified cadmium sulfide. Once iodine has been added to the sample, the remainder of the analysis procedure must be completed according to Sections 7.2.2 through 7.3.2.

11. *Bibliography*

1. Determination of Hydrogen Sulfide, Ammoniacal Cadmium Chloride Method. API Method 772–54. In: Manual on Disposal of Refinery Wastes, Vol. V: Sampling and Analysis of Waste Gases and Particulate Matter, American Petroleum Institute, Washington, DC. 1954.

2. Tentative Method of Determination of Hydrogen Sulfide and Mercaptan Sulfur in Natural Gas, Natural Gas Processors Association, Tulsa, OK. NGPA Publication No. 2265–65. 1965.

3. Knoll, J. E., and M. R. Midgett. Determination of Hydrogen Sulfide in Refinery Fuel Gases, Environmental Monitoring Series, Office of Research and Development, USEPA, Research Triangle Park, NC 27711, EPA 600/4–77–007.

4. Scheil, G. W., and M. C. Sharp. Standardization of Method 11 at a Petroleum Refinery, Midwest Research Institute Draft Report for USEPA, Office of Research and Development, Research Triangle Park, NC 27711, EPA Contract No. 68–02–1098. August 1976, EPA 600/4–77–088a (Volume 1) and EPA 600/4–77–088b (Volume 2).

METHOD 12—DETERMINATION OF INORGANIC LEAD EMISSIONS FROM STATIONARY SOURCES

1. *Principle and Applicability*

1.1 Applicability. This method applies to the determination of inorganic lead (Pb) emissions from specified stationary sources only.

1.2 Principle. Particulate and gaseous Pb emissions are withdrawn isokinetically from the source and collected on a filter and in dilute nitric acid. The collected samples are digested in acid solution and analyzed by atomic absorption spectrometry using an air acetylene flame.

2. *Range, Sensitivity, Precision, and Interferences*

2.1 Range. For a minimum analytical accuracy of ±10 percent, the lower limit of the range is 100 μg. The upper limit can be considerably extended by dilution.

2.2 Analytical Sensitivity. Typical sensitivities for a 1-percent change in absorption (0.0044 absorbance units) are 0.2 and 0.5 μg Pb/ml for the 217.0 and 283.3 nm lines, respectively.

2.3 Precision. The within-laboratory precision, as measured by the coefficient of variation ranges from 0.2 to 9.5 percent relative to a run-mean concentration. These values were based on tests conducted at a gray iron foundry, a lead storage battery manufacturing plant, a secondary lead smelter, and a

RM Tests, and Calculations. This is the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively. Note: For Method 16, a sample is made up of at least three separate injects equally spaced over time. For Method 16A, a sample is collected for at least 1 hour.

3.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulations, Method 16, Method 16A, or other approved alternative, shall be the RM for TRS.

4. Bibliography

1. Department of Commerce. Experimental Statistics. National Bureau of Standards. Handbook 91. 1963. Paragraphs 3–3.1.4, p. 3–31.

2. A Guide to the Design, Maintenance and Operation of TRS Monitoring Systems. National Council for Air and Stream Improvement Technical Bulletin No. 89. September 1977.

3. Observation of Field Performance of TRS Monitors on a Kraft Recovery Furnace. National Council for Air and Stream Improvement Technical Bulletin No. 91. January 1978.

PERFORMANCE SPECIFICATION 6—SPECIFICATIONS AND TEST PROCEDURES FOR CONTINUOUS EMISSION RATE MONITORING SYSTEMS IN STATIONARY SOURCES

1. Applicability and Principle

1.1 Applicability. The applicability for this specification is the same as Section 1.1 of Performance Specification 2 (PS 2), except this specification is to be used for evaluating the acceptability of continuous emission rate monitoring systems (CERMS's). The installation and measurement location specifications, performance specification test procedure, data reduction procedures, and reporting requirements of PS 2, Section 3, 5, 8, and 9, apply to this specification.

1.2 Principle. Reference method (RM), calibration drift (CD), and relative accuracy (RA) tests are conducted to determine that the CERMS conforms to the specification.

2. Definitions

The definitions are the same as in Section 2 of PS 2, except that this specification refers to the continuous emission rate monitoring system rather than the continuous emission monitoring system. The following definitions are added:

2.1 Continuous Emission Rate Monitoring System (CERMS). The total equipment required for the determination and recording of the pollutant mass emission rate (in terms of mass per unit of time).

2.2 Flow Rate Sensor. That portion of the CERMS that senses the volumetric flow rate and generates an output proportional to flow rate. The flow rate sensor shall have provisions to check the CD for each flow rate parameter that it measures individually (e.g., velocity pressure).

3. Performance and Equipment Specifications

3.1 Data Recorder Scale. Same as Section 4.1 of PS 2.

3.2 CD. Since the CERMS includes analyzers for several measurements, the CD shall be determined separately for each analyzer in terms of its specific measurement. The calibration for each analyzer used for the measurement of flow rate except a temperature analyzer shall not drift or deviate from either of its reference values by more than 3 percent of 1.25 times the average potential absolute value for that measurement. For a temperature analyzer, the specification is 1.5 percent of 1.25 times the average potential absolute temperature. The CD specification for each analyzer for which other PS's have been established (e.g., PS 2 for SO_2 and NO_x), shall be the same as in the applicable PS.

3.3 CERMS RA. The RA of the CERMS shall be no greater than 20 percent of the mean value of the RM's test data in terms of the units of the emission standard, or 10 percent of the applicable standard, whichever is greater.

4. CD Test Procedure

The CD measurements are to verify the ability of the CERMS to conform to the established CERMS calibrations used for determining the emission rate. Therefore, if periodic automatic or manual adjustments are made to the CERMS zero and calibration settings, conduct the CD tests immediately before these adjustments, or conduct them in such a way what CD can be determined.

Conduct the CD tests for pollutant concentration at the two values specified in Section 4.1 of PS 2. For each of the other parameters that are selectively measured by the CERMS (e.g., velocity pressure), use two analogous values: one that represents zero to 20 percent of the high-level value (a value that is between 1.25 and 2 times the average potential value) for that parameter, and one that represents 50 to 100 percent of the high-level value. Introduce, or activate internally, the reference signals to the CERMS (these need not be certified). Record the CERMS response to each, and subtract this value from the respective reference value (see example data sheet in Figure 6–1).

5. RA Test Procedure

5.1 Sampling Strategy for RM's Tests, Correlation of RM and CERMS Data, Number of RM's Tests, and Calculations. These are the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively. Summarize the results on a data sheet. An example is shown in Figure 6–2. The RA test may be conducted during the CD test period.

5.2 Reference Methods (RM's). Unless otherwise specified in the applicable subpart of the regulations, the RM for the pollutant gas is the appendix A method that is cited for compliance test purposes, or its approved alternatives. Methods 2, 2A, 2B, 2C, or 2D, as applicable are the RM's for the determination of volumetric flow rate.

6. Bibliography

1. Brooks, E.F., E.C. Beder, C.A. Flegal, D.J. Luciani, and R. Williams. Continuous Measurement of Total Gas Flow Rate from Stationary Sources. U.S. Envionmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–650/2–75–020. February 1975. 248 p.

PERFORMANCE SPECIFICATION 7—SPECIFICATIONS AND TEST PROCEDURES FOR HYDROGEN SULFIDE CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

1. Applicability and Principle

1.1 *Applicability.* 1.1.1 This specification is to be used for evaluating the acceptability of hydrogen sulfide (H_2S) continuous emission monitoring systems (CEMS's) at the time of or soon after installation and whenever specified in an applicable subpart of the regulations.

1.1.2 This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess CEMS performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS. To evaluate CEMS performance, the Administrator may require, under Section 114 of the Act, the source owner or operator to conduct CEMS performance evaluations at other times besides the initial test. *See* §60.13(c).

1.1.3 The definitions, installation specifications, test procedures, data reduction procedures for determining calibration drifts (CD) and relative accuracy (RA), and reporting of Performance Specification 2 (PS 2), Sections 2, 3, 5, 6, 8, and 9 apply to this specification.

1.2 Principle. Reference method (RM), CD, and RA tests are conducted to determine that the CEMS conforms to the specification.

2. Performance and Equipment Specifications

2.1 *Instrument zero and span.* This specification is the same as Section 4.1 of PS 2.

2.2 *Calibration drift.* The CEMS calibration must not drift or deviate from the reference value of the calibration gas or reference source by more than 5 percent of the established span value for 6 out of 7 test days (e.g., the established span value is 300 ppm for subpart J fuel gas combustion devices).

2.3 *Relative accuracy.* The RA of the CEMS shall be no greater than 20 percent of the mean value of the RM test data in terms of the units of the emission standard or 10 percent of the applicable standard, whichever is greater.

3. Relative Accuracy Test Procedure

3.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data Number of RM Tests, and Calculations. These are the same as that in PS 2, §7.1, 7.2, 7.3, and 7.5, respectively.

3.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulation, Method 11 is the RM for this PS.

4. Bibliography

1. U.S. Environmental Protection Agency. Standards of Performance for New Stationary Sources; Appendix B; Performance Specifications 2 and 3 for SO_2, NO_x, CO_2, and O_2 Continuous Emission Monitoring Systems; Final Rule. 48 CFR 23608. Washington, DC, U.S. Government Printing Office. May 25, 1983.

2. U.S. Government Printing Office. Gaseous Continuous Emission Monitoring Systems—Performance Specification Guidelines for SO_2, NO_x, CO_2, O_2, and TRS. U.S. Environmental Protection Agency. Washington, DC, EPA–450/3–82–026. October 1982. 26p.

3. Maines, G.D., W.C. Kelly (Scott Environmental Technology, Inc.), and J.B. Homolya. Evaluation of Monitors for Measuring H_2S in Refinery Gas. Prepared for the U.S. Environmental Protection Agency. Research Triangle Park, NC, Contract No. 68–02–2707. 1978. 60 p.

4. Ferguson, B.B., R.E. Lester (Harmon Engineering and Testing), and W.J. Mitchell. Field Evaluation of Carbon Monoxide and Hydrogen Sulfide Continuous Emission Monitors at an Oil Refinery. Prepared for the U.S. Environmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–600/4–82–054. August 1982. 100 p.

[48 FR 13327, Mar. 30, 1983 and 48 FR 23611, May 25, 1983, as amended at 48 FR 32986, July 20, 1983; 51 FR 31701, Aug. 5, 1985; 52 FR 17556, May 11, 1987; 52 FR 30675, Aug. 18, 1987; 52 FR 34650, Sept. 14, 1987; 53 FR 7515, Mar. 9, 1988; 53 FR 41335, Oct. 21, 1988; 55 FR 18876, May 7, 1990; 55 FR 40178, Oct. 2, 1990; 55 FR 47474, Nov. 14, 1990; 56 FR 5526, Feb. 11, 1991]

APPENDIX C TO PART 60—DETERMINATION OF EMISSION RATE CHANGE

1. *Introduction.*

1.1 The following method shall be used to determine whether a physical or operational change to an existing facility resulted in an increase in the emission rate to the atmosphere. The method used is the Student's *t*

test, commonly used to make inferences from small samples.

2. *Data.*

2.1 Each emission test shall consist of n runs (usually three) which produce n emission rates. Thus two sets of emission rates are generated, one before and one after the change, the two sets being of equal size.

2.2 When using manual emission tests, except as provided in §60.8(b) of this part, the reference methods of appendix A to this part shall be used in accordance with the procedures specified in the applicable subpart both before and after the change to obtain the data.

2.3 When using continuous monitors, the facility shall be operated as if a manual emission test were being performed. Valid data using the averaging time which would be required if a manual emission test were being conducted shall be used.

3. *Procedure.*

3.1 Subscripts a and b denote prechange and postchange respectively.

3.2 Calculate the arithmetic mean emission rate, E, for each set of data using Equation 1.

$$E=\sum_{\substack{i=1\\ n}}^{n} E_i=\frac{E_1+E_2\ \ldots\ +E_n}{n} \qquad (1)$$

Where:

E_i=Emission rate for the i th run.

n=number of runs.

3.3 Calculate the sample variance, S^2, for each set of data using Equation 2.

$$S^2=\frac{\sum_{i=1}^{n}(E_i-E)^2}{n-1}=\frac{\sum_{i=1}^{n}E_i^2-\left(\sum_{i=1}^{n}E_i\right)^2\Big/n}{n-1} \qquad (2)$$

3.4 Calculate the pooled estimate, S_p, using Equation 3.

$$S_p=\left[\frac{(n_a-1)\ S_a^2+(n_b-1)\ S_b^2}{n_a+n_b-2}\right]^{1/2} \qquad (3)$$

3.5 Calculate the test statistic, t, using Equation 4.

$$t=\frac{E_b-E_a}{S_p\left[\frac{1}{n_a}+\frac{1}{n_b}\right]^{1/2}} \qquad (4)$$

4. *Results.*

4.1 If $E_b>E_a$ and $t>t'$, where t' is the critical value of t obtained from Table 1, then with 95% confidence the difference between E_b and E_a is significant, and an increase in emission rate to the atmosphere has occurred.

TABLE 1

Degrees of freedom (n_a+n_b-2)	t' (95 percent confidence level)
2	2.920
3	2.353
4	2.132
5	2.015
6	1.943
7	1.895
8	1.860

For greater than 8 degrees of freedom, see any standard statistical handbook or text.

5.1 Assume the two performance tests produced the following set of data:

Test a	Test b
Run 1. 100	115
Run 2. 95	120
Run 3. 110	125

5.2 Using Equation 1—

E_a=100+95+110/3=102

E_b=115+120+125/3=120

5.3 Using Equation 2—

$S_a^2=(100-102)^2+(95-102)^2+(110-102)^2/3-1=58.5$

$S_b^2=(115-120)^2+(120-120)^2+(125-120)^2/3-1=25$

5.4 Using Equation 3—

$S_p=[(3-1)(58.5)+(3+1)(25)/3+3-2]^{1/2}=6.46$

5.5 Using Equation 4—

$$t=\frac{120-102}{6.46\left[\frac{1}{3}+\frac{1}{3}\right]^{1/2}}=3.412$$

5.6 Since $(n_1+n_2-2)=4$, $t'=2.132$ (from Table 1). Thus since $t>t'$ the difference in the values of E_a and E_b is significant, and there has been an increase in emission rate to the atmosphere.

6. *Continuous Monitoring Data.*

6.1 Hourly averages from continuous monitoring devices, where available, should be used as data points and the above procedure followed.

[40 FR 58420, Dec. 16, 1975]

APPENDIX D TO PART 60—REQUIRED EMISSION INVENTORY INFORMATION

(a) Completed NEDS point source form(s) for the entire plant containing the designated facility, including information on the applicable criteria pollutants. If data concerning the plant are already in NEDS, only that information must be submitted which is necessary to update the existing

NEDS record for that plant. Plant and point identification codes for NEDS records shall correspond to those previously assigned in NEDS; for plants not in NEDS, these codes shall be obtained from the appropriate Regional Office.

(b) Accompanying the basic NEDS information shall be the following information on each designated facility:

(1) The state and county identification codes, as well as the complete plant and point identification codes of the designated facility in NEDS. (The codes are needed to match these data with the NEDS data.)

(2) A description of the designated facility including, where appropriate:

(i) Process name.

(ii) Description and quantity of each product (maximum per hour and average per year).

(iii) Description and quantity of raw materials handled for each product (maximum per hour and average per year).

(iv) Types of fuels burned, quantities and characteristics (maximum and average quantities per hour, average per year).

(v) Description and quantity of solid wastes generated (per year) and method of disposal.

(3) A description of the air pollution control equipment in use or proposed to control the designated pollutant, including:

(i) Verbal description of equipment.

(ii) Optimum control efficiency, in percent. This shall be a combined efficiency when more than one device operates in series. The method of control efficiency determination shall be indicated (e.g., design efficiency, measured efficiency, estimated efficiency).

(iii) Annual average control efficiency, in percent, taking into account control equipment down time. This shall be a combined efficiency when more than one device operates in series.

(4) An estimate of the designated pollutant emissions from the designated facility (maximum per hour and average per year). The method of emission determination shall also be specified (e.g., stack test, material balance, emission factor).

[40 FR 53349, Nov. 17, 1975]

APPENDIX E TO PART 60—[RESERVED]

APPENDIX F TO PART 60—QUALITY ASSURANCE PROCEDURES

PROCEDURE 1. QUALITY ASSURANCE REQUIREMENTS FOR GAS CONTINUOUS EMISSION MONITORING SYSTEMS USED FOR COMPLIANCE DETERMINATION

1. Applicability and Principle

1.1 Applicability. Procedure 1 is used to evaluate the effectiveness of quality control (QC) and quality assurance (QA) procedures and the quality of data produced by any continuous emission monitoring system (CEMS) that is used for determining compliance with the emission standards on a continuous basis as specified in the applicable regulation. The CEMS may include pollutant (e.g., SO_2 and NO_x) and diluent (e.g., O_2 or CO_2) monitors.

This procedure specifies the minimum QA requirements necessary for the control and assessment of the quality of CEMS data submitted to the Environmental Protection Agency (EPA). Source owners and operators responsible for one or more CEMS's used for compliance monitoring must meet these minimum requirements and are encouraged to develop and implement a more extensive QA program or to continue such programs where they already exist.

Data collected as a result of QA and QC measures required in this procedure are to be submitted to the Agency. These data are to be used by both the Agency and the CEMS operator in assessing the effectiveness of the CEMS QC and QA procedures in the maintenance of acceptable CEMS operation and valid emission data.

Appendix F, Procedure 1 is applicable December 4, 1987. The first CEMS accuracy assessment shall be a relative accuracy test audit (RATA) (see section 5) and shall be completed by March 4, 1988 or the date of the initial performance test required by the applicable regulation, whichever is later.

1.2 Principle. The QA procedures consist of two distinct and equally important functions. One function is the assessment of the quality of the CEMS data by estimating accuracy. The other function is the control and improvement of the quality of the CEMS data by implementing QC policies and corrective actions. These two functions form a control loop: When the assessment function indicates that the data quality is inadequate, the control effort must be increased until the data quality is acceptable. In order to provide uniformity in the assessment and reporting of data quality, this procedure explicitly specifies the assessment methods for response drift and accuracy. The methods are based on procedures included in the applicable performance specifications (PS's) in appendix B of 40 CFR part 60. Procedure 1 also requires the analysis of the EPA audit samples concurrent with certain reference method (RM) analyses as specified in the applicable RM's.

Because the control and corrective action function encompasses a variety of policies, specifications, standards, and corrective measures, this procedure treats QC requirements in general terms to allow each source owner or operator to develop a QC system that is most effective and efficient for the circumstances.

2. Definitions

2.1 Continuous Emission Monitoring System. The total equipment required for the

determination of a gas concentration or emission rate.

2.2 Diluent Gas. A major gaseous constituent in a gaseous pollutant mixture. For combustion sources, CO_2 and O_2 are the major gaseous constituents of interest.

2.3 Span Value. The upper limit of a gas concentration measurement range that is specified for affected source categories in the applicable subpart of the regulation.

2.4 Zero, Low-Level, and High-Level Values. The CEMS response values related to the source specific span value. Determination of zero, low-level, and high-level values is defined in the appropriate PS in appendix B of this part.

2.5 Calibration Drift (CD). The difference in the CEMS output reading from a reference value after a period of operation during which no unscheduled maintenance, repair or adjustment took place. The reference value may be supplied by a cylinder gas, gas cell, or optical filter and need not be certified.

2.6 Relative Accuracy (RA). The absolute mean difference between the gas concentration or emission rate determined by the CEMS and the value determined by the RM's plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests or the applicable emission limit.

3. QC Requirements

Each source owner or operator must develop and implement a QC program. As a minimum, each QC program must include written procedures which should describe in detail, complete, step-by-step procedures and operations for each of the following activities:

1. Calibration of CEMS.
2. CD determination and adjustment of CEMS.
3. Preventive maintenance of CEMS (including spare parts inventory).
4. Data recording, calculations, and reporting.
5. Accuracy audit procedures including sampling and analysis methods.
6. Program of corrective action for malfunctioning CEMS.

As described in Section 5.2, whenever excessive inaccuracies occur for two consecutive quarters, the source owner or operator must revise the current written procedures or modify or replace the CEMS to correct the deficiency causing the excessive inaccuracies.

These written procedures must be kept on record and available for inspection by the enforcement agency.

4. CD Assessment

4.1 CD Requirement. As described in 40 CFR 60.13(d), source owners and operators of CEMS must check, record, and quantify the CD at two concentration values at least once daily (approximately 24 hours) in accordance with the method prescribed by the manufacturer. The CEMS calibration must, as minimum, be adjusted whenever the daily zero (or low-level) CD or the daily high-level CD exceeds two times the limits of the applicable PS's in appendix B of this regulation.

4.2 Recording Requirement for Automatic CD Adjusting Monitors. Monitors that automatically adjust the data to the corrected calibration values (e.g., microprocessor control) must be programmed to record the unadjusted concentration measured in the CD prior to resetting the calibration, if performed, or record the amount of adjustment.

4.3 Criteria for Excessive CD. If either the zero (or low-level) or high-level CD result exceeds twice the applicable drift specification in appendix B for five, consecutive, daily periods, the CEMS is out-of-control. If either the zero (or low-level) or high-level CD result exceeds four times the applicable drift specification in appendix B during any CD check, the CEMS is out-of-control. If the CEMS is out-of-control, take necessary corrective action. Following corrective action, repeat the CD checks.

4.3.1 Out-Of-Control Period Definition. The beginning of the out-of-control period is the time corresponding to the completion of the fifth, consecutive, daily CD check with a CD in excess of two times the allowable limit, or the time corresponding to the completion of the daily CD check preceding the daily CD check that results in a CD in excess of four times the allowable limit. The end of the out-of-control period is the time corresponding to the completion of the CD check following corrective action that results in the CD's at both the zero (or low-level) and high-level measurement points being within the corresponding allowable CD limit (i.e., either two times or four times the allowable limit in appendix B).

4.3.2 CEMS Data Status During Out-of-Control Period. During the period the CEMS is out-of-control, the CEMS data may not be used in calculating emission compliance nor be counted towards meeting minimum data availability as required and described in the applicable subpart [e.g., §60.47a(f)].

4.4 Data Recording and Reporting. As required in §60.7(d) of this regulation (40 CFR part 60), all measurements from the CEMS must be retained on file by the source owner for at least 2 years. However, emission data obtained on each successive day while the CEMS is out-of-control may not be included as part of the minimum daily data requirement of the applicable subpart [e.g., §60.47a(f)] nor be used in the calculation of reported emissions for that period.

5. Data Accuracy Assessment

5.1 Auditing Requirements. Each CEMS must be audited at least once each calendar quarter. Successive quarterly audits shall occur no closer than 2 months. The audits shall be conducted as follows:

5.1.1 Relative Accuracy Test Audit (RATA). The RATA must be conducted at least once every four calendar quarters. Conduct the RATA as described for the RA test procedure in the applicable PS in appendix B (e.g., PS 2 for SO_2 and NO_x). In addition, analyze the appropriate performance audit samples received from EPA as described in the applicable sampling methods (e.g., Methods 6 and 7).

5.1.2 Cylinder Gas Audit (CGA). If applicable, a CGA may be conducted in three of four calendar quarters, but in no more than three quarters in succession.

To conduct a CGA: (1) Challenge the CEMS (both pollutant and diluent portions of the CEMS, if applicable) with an audit gas of known concentration at two points within the following ranges:

Audit point	Audit range		
	Pollutant monitors	Diluent monitors for—	
		CO_2	O_2
1	20 to 30% of span value.	5 to 8% by volume.	4 to 6% by volume.
2	50 to 60% of span value.	10 to 14% by volume.	8 to 12% by volume.

Challenge the CEMS three times at each audit point, and use the average of the three responses in determining accuracy.

Use of separate audit gas cylinder for audit points 1 and 2. Do not dilute gas from audit cylinder when challenging the CEMS.

The monitor should be challenged at each audit point for a sufficient period of time to assure adsorption-desorption of the CEMS sample transport surfaces has stabilized.

(2) Operate each monitor in its normal sampling mode, i.e., pass the audit gas through all filters, scrubbers, conditioners, and other monitor components used during normal sampling, and as much of the sampling probe as is practical. At a minimum, the audit gas should be introduced at the connection between the probe and the sample line.

(3) Use audit gases that have been certified by comparision to National Bureau of Standards (NBS) gaseous Standard Reference Materials (SRM's) or NBS/EPA approved gas manufacturer's Certified Reference Materials (CRM's) (See Citation 1) following EPA Traceability Protocol No. 1 (See Citation 2). As an alternative to Protocol No. 1 audit gases, CRM's may be used directly as audit gases. A list of gas manufacturers that have prepared approved CRM's is available from EPA at the address shown in Citation 1. Procedures for preparation of CRM's are described in Citation 1. Procedures for preparation of EPA Traceability Protocol 1 materials are described in Citation 2.

The difference between the actual concentration of the audit gas and the concentration indicated by the monitor is used to assess the accuracy of the CEMS.

5.1.3 Relative Accuracy Audit (RAA). The RAA may be conducted three of four calendar quarters, but in no more than three quarters in succession. To conduct a RAA, follow the procedure described in the applicable PS in appendix B for the relative accuracy test, except that only three sets of measurement data are required. Analyses of EPA performance audit samples are also required.

The relative difference between the mean of the RM values and the mean of the CEMS responses will be used to assess the accuracy of the CEMS.

5.1.4 Other Alternative Audits. Other alternative audit procedures may be used as approved by the Administrator for three of four calendar quarters. One RATA is required at least once every four calendar quarters.

5.2 Excessive Audit Inaccuracy. If the RA, using the RATA, CGA, or RAA exceeds the criteria in section 5.2.3, the CEMS is out-of-control. If the CEMS is out-of-control, take necessary corrective action to eliminate the problem. Following corrective action, the source owner or operator must audit the CEMS with a RATA, CGA, or RAA to determine if the CEMS is operating within the specifications. A RATA must always be used following an out-of-control period resulting from a RATA. The audit following corrective action does not require analysis of EPA performance audit samples. If audit results show the CEMS to be out-of-control, the CEMS operator shall report both the audit showing the CEMS to be out-of-control and the results of the audit following corrective action showing the CEMS to be operating within specifications.

5.2.1 Out-Of-Control Period Definition. The beginning of the out-of-control period is the time corresponding to the completion of the sampling for the RATA, RAA, or CGA. The end of the out-of-control period is the time corresponding to the completion of the sampling of the subsequent successful audit.

5.2.2 CEMS Data Status During Out-Of-Control Period. During the period the monitor is out-of-control, the CEMS data may not be used in calculating emission compliance nor be counted towards meeting minimum data availabilty as required and described in the applicable subpart [e.g., §60.47a(f)].

5.2.3 Criteria for Excessive Audit Inaccuracy. Unless specified otherwise in the applicable subpart, the criteria for excessive inaccuracy are:

(1) For the RATA, the allowable RA in the applicable PS in appendix B.

(2) For the CGA, ±15 percent of the average audit value or ±5 ppm, whichever is greater.

(3) For the RAA, ±15 percent of the three run average or ±7.5 percent of the applicable standard, whichever is greater.

5.3 Criteria for Acceptable QC Procedure. Repeated excessive inaccuracies (i.e., out-of-control conditions resulting from the quarterly audits) indicates the QC procedures are inadequate or that the CEMS is incapable of providing quality data. Therefore, whenever excessive inaccuracies occur for two consective quarters, the source owner or operator must revise the QC procedures (see Section 3) or modify or replace the CEMS.

6. *Calculations for CEMS Data Accuracy*

6.1 RATA RA Calculation. Follow the equations described in Section 8 of appendix B, PS 2 to calculate the RA for the RATA. The RATA must be calculated in units of the applicable emission standard (e.g., ng/J).

6.2 RAA Accuracy Calculation. Use Equation 1–1 to calculate the accuracy for the RAA. The RAA must be calculated in units of the applicable emission standard (e.g., ng/J).

6.3 CGA Accuracy Calculation. Use Equation 1–1 to calculate the accuracy for the CGA, which is calculated in units of the appropriate concentration (e.g., ppm SO_2 or percent O_2). Each component of the CEMS must meet the acceptable accuracy requirement.

$$A = \frac{C_m - C_a}{C_a} \times 100 \qquad \text{Eq. 1–1}$$

where:

A = Accuracy of the CEMS, percent.

C_m = Average CEMS response during audit in units of applicable standard or appropriate concentration.

C_a = Average audit value (CGA certified value or three-run average for RAA) in units of applicable standard or appropriate concentration.

6.4 Example Accuracy Calculations. Example calculations for the RATA, RAA, and CGA are available in Citation 3.

7. *Reporting Requirements*

At the reporting interval specified in the applicable regulation, report for each CEMS the accuracy results from Section 6 and the CD assessment results from Section 4. Report the drift and accuracy information as a Data Assessment Report (DAR), and include one copy of this DAR for each quarterly audit with the report of emissions required under the applicable subparts of this part.

As a minimum, the DAR must contain the following information:

1. Source owner or operator name and address.

2. Identification and location of monitors in the CEMS.

3. Manufacturer and model number of each monitor in the CEMS.

4. Assessment of CEMS data accuracy and date of assessment as determined by a RATA, RAA, or CGA described in Section 5 including the RA for the RATA, the A for the RAA or CGA, the RM results, the cylinder gases certified values, the CEMS responses, and the calculations results as defined in Section 6. If the accuracy audit results show the CEMS to be out-of-control, the CEMS operator shall report both the audit results showing the CEMS to be out-of-control and the results of the audit following corrective action showing the CEMS to be operating within specifications.

5. Results from EPA performance audit samples described in Section 5 and the applicable RM's.

6. Summary of all corrective actions taken when CEMS was determined out-of-control, as described in Sections 4 and 5.

An example of a DAR format is shown in Figure 1.

8. *Bibliography*

1. "A Procedure for Establishing Traceability of Gas Mixtures to Certain National Bureau of Standards Standard Reference Materials." Joint publication by NBS and EPA-600/7–81–010. Available from the U.S. Environmental Protection Agency. Quality Assurance Division (MD–77). Research Triangle Park, NC 27711.

2. "Traceability Protocol for Establishing True Concentrations of Gases Used for Calibration and Audits of Continuous Source Emission Monitors (Protocol Number 1)" June 1978. Section 3.0.4 of the Quality Assurance Handbook for Air Pollution Measurement Systems. Volume III. Stationary Source Specific Methods. EPA–600/4–77–027b. August 1977. U.S. Environmental Protection Agency. Office of Research and Development Publications, 26 West St. Clair Street, Cincinnati, OH 45268.

3. Calculation and Interpretation of Accuracy for Continuous Emission Monitoring Systems (CEMS). Section 3.0.7 of the Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods. EPA–600/4–77–027b. August 1977. U.S. Environmental Protection Agency. Office of Research and Development Publications, 26 West St. Clair Street, Cincinnati, OH 45268.

FIGURE 1—EXAMPLE FORMAT FOR DATA ASSESSMENT REPORT

Period ending date _____

Year _____

Company name _____

Plant name _____

Source unit no. _____

CEMS manufacturer _____

Model no. _____

CEMS serial no. _____

CEMS type (e.g., in situ) _____

CEMS sampling location (e.g., control device outlet) _____

CEMS span values as per the applicable regulation: _____ (e.g., SO_2 _____ ppm, NO_x _____ ppm). _____

I. Accuracy assessment results (Complete A, B, or C below for each CEMS or for each pollutant and diluent analyzer, as applicable.) If the quarterly audit results show the CEMS to be out-of-control, report the results of both the quarterly audit and the audit following corrective action showing the CEMS to be operating properly.

A. Relative accuracy test audit (RATA) for _____ (e.g., SO_2 in ng/J).

1. Date of audit _____.
2. Reference methods (RM's) used _____ (e.g., Methods 3 and 6).
3. Average RM value _____ (e.g., ng/J, mg/dsm³, or percent volume).
4. Average CEMS value _____.
5. Absolute value of mean difference [d] _____.
6. Confidence coefficient [CC] _____.
7. Percent relative accuracy (RA) _____ percent.
8. EPA performance audit results:
a. Audit lot number (1) _____ (2) _____
b. Audit sample number (1) _____ (2) _____
c. Results (mg/dsm³) (1) _____ (2) _____
d. Actual value (mg/dsm³)* (1) _____ (2) _____
e. Relative error* (1) _____ (2) _____

B. Cylinder gas audit (CGA) for _____ (e.g., SO_2 in ppm).

	Audit point 1	Audit point 2	
1. Date of audit	.....	.....	
2. Cylinder ID number	.....	.....	
3. Date of certification	.....	.....	
4. Type of certification	.....	.....	(e.g., EPA Protocol 1 or CRM).
5. Certified audit value	.....	.....	(e.g., ppm).
6. CEMS response value.	.....	.....	(e.g., ppm).
7. Accuracy	.....	.....	percent.

C. Relative accuracy audit (RAA) for _____ (e.g., SO_2 in ng/J).

1. Date of audit _____.
2. Reference methods (RM's) used _____ (e.g., Methods 3 and 6).
3. Average RM value _____ (e.g., ng/J).
4. Average CEMS value _____.
5. Accuracy _____ percent.
6. EPA performance audit results:
a. Audit lot number (1) _____ (2) _____
b. Audit sample number (1) _____ (2) _____
c. Results (mg/dsm³) (1) _____ (2) _____
d. Actual value (mg/dsm³) *(1) _____ (2) _____
e. Relative error* (1) _____ (2) _____

*To be completed by the Agency.

D. Corrective action for excessive inaccuracy.

1. Out-of-control periods.
a. Date(s) _____.
b. Number of days _____.
2. Corrective action taken _____

3. Results of audit following corrective action. (Use format of A, B, or C above, as applicable.)

II. Calibration drift assessment.

A. Out-of-control periods.
1. Date(s) _____.
2. Number of days _____.

B. Corrective action taken _____

[52 FR 21008, June 4, 1987; 52 FR 27612, July 22, 1987, as amended at 56 FR 5527, Feb. 11, 1991]

APPENDIX G TO PART 60—PROVISIONS FOR AN ALTERNATIVE METHOD OF DEMONSTRATING COMPLIANCE WITH 40 CFR 60.43 FOR THE NEWTON POWER STATION OF CENTRAL ILLINOIS PUBLIC SERVICE COMPANY

1. *Designation of Affected Facilities*

1.1 The affected facilities to which this alternative compliance method applies are the Unit 1 and 2 coal-fired steam generating units located at the Central Illinois Public Service Company's (CIPS) Newton Power Station in Jasper County, Illinois. Each of these units is subject to the Standards of Performance for Fossil-Fuel-Fired Steam Generators for Which Construction Commenced After August 17, 1971 (subpart D).

2. *Definitions*

2.1 All definitions in subparts D and Da of part 60 apply to this provision except that:

24-hour period means the period of time between 12:00 midnight and the following midnight.

Boiler operating day means a 24-hour period during which any fossil is combusted in either the Unit 1 or Unit 2 steam generating unit and during which the provisions of §60.43(e) are applicable.

CEMs means continuous emission monitoring system.

Coal bunker means a single or group of coal trailers, hoppers, silos or other containers that:

(1) are physically attached to the affected facility; and

(2) provide coal to the coal pulverizers.

DAFGDS means the dual alkali flue gas desulfurization system for the Newton Unit 1 steam generating unit.

3. *Compliance Provisions*

3.1 If the owner or operator of the affected facility elects to comply with the 470 ng/J (1.1 lbs/MMBTU) of combined heat input emission limit under §60.43(e), he shall notify

the Regional Administrator, of the United States Environmental Protection Agency (USEPA), Region 5 and the Director, of the Illinois Environmental Protection Agency (IEPA) at least 30 days in advance of the date such election is to take effect, stating the date such operation is to commence. When the owner or operator elects to comply with this limit after one or more periods of reverting to the 520 ng/J heat input (1.2 lbs/MMBTU) limit of §60.43(a)(2), as provided under 3.4, he shall notify the Regional Administrator of the USEPA, Region 5 and the Director of the (IEPA) in writing at least ten (10) days in advance of the date such election is to take effect.

3.2 Compliance with the sulfur dioxide emission limit under §60.43(e) is determined on a continuous basis by performance testing using CEMs. Within 60 days after the initial operation of Units 1 and 2 subject to the combined emission limit in §60.43(e), the owner or operator shall conduct an initial performance test, as required by §60.8, to determine compliance with the combined emission limit. This initial performance test is to be scheduled so that the thirtieth boiler operating day of the 30 successive boiler operating days is completed within 60 days after initial operation subject to the 470 ng/J (1.1 lbs/MMBTU) combined emission limit. Following the initial performance test, a separate performance test is completed at the end of each boiler operating day Unit 1 and Unit 2 are subject to §60.43(e), and a new 30 day average emission rate calculated.

3.2.1 Following the initial performance test, a new 30 day average emission rate is calculated for each boiler operating day the affected facility is subject to §60.43(e). If the owner or operator of the affected facility elects to comply with §60.43(e) after one or more periods of reverting to the 520 ng/J heat input (1.2 lbs/MMBTU) limit under §60.43(a)(2), as provided under 3.4, the 30 day average emission rate under §60.43(e) is calculated using emissions data of the current boiler operating day and data for the previous 29 boiler operating days when the affected facility was subject to §60.43(e). Periods of operation of the affected facility under §60.43(a)(2) are not considered boiler operating days. Emissions data collected during operation under §60.43(a)(2) are not considered relative to 4.6 and emissions data are not included in calculations of emission under §60.43(e).

3.2.2 When the affected facility is operated under the provisions of §60.43(e), the Unit 1 DAFGDS bypass damper must be fully closed. The DAFGDS bypass may be opened only during periods of DAFGDS startup, shutdown, malfunction or testing as described under Sections 3.5.1, 3.5.2, 3.5.3, 3.5.4, and 4.8.2.

3.3 Compliance with the sulfur dioxide emission limit set forth in §60.43(e) is based on the average combined hourly emission rate from Units 1 and 2 for 30 successive boiler operating days determined as follows:

$$E30 = \frac{1}{n}\sum_{i=1}^{n} EC(i)$$

where:

n=the number of available hourly combined emission rate values in the 30 successive boiler operating day period where Unit 1 and Unit 2 are subject to §60.43(e).

E30=average emission rate for 30 successive boiler operating days where Unit 1 and Unit 2 are subject to §60.43(e).

EC=the hourly combined emission rate from Units 1 and 2, in ng/J or lbs/MMBTU.

3.3.1 The average hourly combined emission rate for Units 1 and 2for each hour of operation of either Unit 1 or 2, or both, is determined as follows:

EC=[(E1)+(E2)]/[H1+H2]

where:

EC=the hourly combined SO_2 emission rate, lbs/MMBTU, from Units 1 and 2 when Units 1 and 2 are subject to §60.43(e).

E1=the hourly SO_2 mass emission, lb/hr, from Unit 1 as determined from CEMs data using the calculation procedures in section 4 of this appendix.

E2=the hourly SO_2 mass emission, lb/hr, from Unit 2 as determined from CEMs data using the calculation procedures in section 4 of this appendix.

H1=the hourly heat input, MMBTU/HR to Unit 1 as determined in section 4 of this appendix.

H2=the hourly heat input, MMBTU/HR, to Unit 2 as determined by section 4 of this appendix.

3.3.2 If data for any of the four hourly parameters (E1, E2, H1and H2, under 3.3.1 are unavailable during an hourly period, the combined emission rate (EC) is not calculated and the period is counted as missing data under 4.6.1., except as provided under 3.5. and 4.4.2.

3.4 After the date of initial operation subject to the combined emission limit, Units 1 and 2 shall remain subject to the combined emission limit and the owner or operator shall remain subject to the requirements of this Appendix until the initial performance test as required by 3.2 is completed and the owner or operator of the affected facility elects and provides notice to revert on a certain date to the 520 ng/J heat input (1.2 lbs/MMBTU) limit of §60.43(a)(2) applicable separately at each unit. The Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA shall be given written notification from CIPS as soon as possible of CIPs' decision to revert to the 520 ng/J heat input (1.2 lbs/MMBTU) limit of §60.43(a)(2)

separately at each unit, but no later than 10 days in advance of the date such election is to take effect.

3.5 Emission monitoring data for Unit 1 may be excluded from calculations of the 30 day rolling average only during the following times:

3.5.1 Periods of DAFGDS startup.

3.5.2 Periods of DAFGDS shutdown.

3.5.3 Periods of DAFGDS malfunction during system emergencies as defined in §60.41a.

3.5.4 The first 250 hours per calendar year of DAFGDS malfunctions of Unit 1 DAFGDS provided that efforts are made to minimize emissions from Unit 1 in accordance with §60.11(d), and if, after 16 hours but not more than 24 hours of DAFGDS malfunction, the owner or operator of the affected facility begins (following the customary loading procedures) loading into the Unit 1 coal bunker, coal with a potential SO_2 emission rate equal to or less than the emission rate of Unit 2 recorded at the beginning of the DAFGDS malfunction. Malfunction periods under 3.5.3 are not counted toward the 250 hour/yr limit under this section.

3.5.4.1 The malfunction exemption in 3.5.4 is limited to the first 250 hours per calendar year of DAFGDS malfunction.

3.5.4.2 For malfunctions of the DAFGDS after the 250 hours per calendar year limit (cumulative), other than those defined in 3.5.3, the owner or operator of the affected facility shall combust lower sulfur coal or use any other method to comply with the 470 ng/J (1.1 lbs/MMBTU) combined emission limit.

3.5.4.3 During the first 250 hours of DAFGDS malfunction per year or during periods of DAFGDS startup, or DAFGDS shutdown, CEMs emissions data from Unit 2 shall continue to be included in the daily calculation of the combined 30 day rolling average emission rate; that is, the load on Unit 1 is assumed to be zero (H1 and E1=O; EC=E2/H2).

3.5.5—3.5.7 [Reserved]

3.6 The provision for excluding CEMs data from Unit 1 during the first 250 hours of DAFGDS malfunctions from combined hourly emissions calculations supersedes the provisions of §60.11(d). However, the general purpose contained in §60.11(d) (i.e., following good control practices to minimize air pollution emission during malfunctions) has not been superseded.

4. Continuous Emission Monitoring

4.1 The CEMs required under Section 3.2 are operated and data are recorded for all periods of operation of the affected facility including periods of the DAFGDS startup, shutdown and malfunction except for CEMs breakdowns, repairs, calibration checks, and zero and span adjustment. All provisions of §60.45 apply except as follows:

4.2 The owner or operator shall install, calibrate, maintain, and operate CEMs and monitoring devices for measuring the following:

4.2.1 For Unit 1:

4.2.1.1 Sulfur dioxide, oxygen or carbon dioxide, and volumetric flow rate for the Unit 1 DAFGDS stack.

4.2.1.2 Sulfur dioxide, oxygen or carbon dioxide, and volumetric flow rate for the Unit 1 DAFGDS bypass stack.

4.2.1.3 Moisture content of the flue gas must be determined continuously for the Unit 1 DAFGDS stack and the Unit 1 DAFGDS bypass stack, if the sulfur dioxide concentration in each stack is measured on a dry basis.

4.2.2 For Unit 2, sulfur dioxide, oxygen or carbon dioxide, and volumetric flow rate.

4.2.2.1 Moisture content of the flue gas must be determined continuously for the Unit 2 stack, if the sulfur dioxide concentration in the stack is measured on a dry basis.

4.2.3 For Units 1 and 2, the hourly heat input, the hourly steam production rate, or the hourly gross electrical power output from each unit.

4.3 For the Unit 1 bypass stack and the Unit 2 stack, the span value of the sulfur dioxide analyzer shall be equivalent to 200 percent of the maximum estimated hourly potential sulfur dioxide emissions of the fuel fired in parts per million sulfur dioxide. For the Unit 1 DAFGDS stack, the span value of the sulfur dioxide analyzer shall be equivalent to 100 percent of the maximum estimated hourly potential emissions of the fuel fired in parts per million sulfur dioxide. The span value for volumetric flow monitors shall be equivalent to 125 percent of the maximum estimated hourly flow in standard cubic meters/minute (standard cubic feet per minute). The span value of the continuous moisture monitors, if required by 4.2.1.3 and 4.2.2.1, shall be equivalent to 100 percent by volume. The span value of the oxygen or carbon dioxide analyzers shall be equivalent to 25 percent by volume.

4.3.1—4.3.2 [Reserved]

4.4 The monitoring devices required in 4.2 shall be installed, calibrated, and maintained as follows:

4.4.1 Each volumetric flow rate monitoring device specified in 4.2 shall be installed at approximately the same location as the sulfur dioxide emission monitoring sample location.

4.4.2 Hourly steam production rate and hourly electrical power output monitoring devices for Unit 1 and Unit 2 shall be calibrated and maintained according to manufacturer's specifications. The data from either of these devices may be used in the calculation of the combined emission rate in Section 3.3.1, only when the hourly heat input for Unit 1 (H1) or the hourly heat input for Unit 2 (H2) cannot be determined from CEM data, and the hourly heat input to steam production or hourly heat input to

electrical power output efficiency over a given segment of each boiler or generator operating range, respectively, varies by less than 5 percent within the specified operating range, or the efficiencies of the boiler/generator units differ by less than 5 percent. The hourly heat input for Unit 1 (H1) or the hourly heat input for Unit 2 (H2) in Section 3.3.1 may also be calculated based on the fuel firing rates and fuel analysis.

4.4.3—4.4.5 [Reserved]

4.5 The hourly mass emissions from Unit 1 (E1) and Unit 2 (E2) and the hourly heat inputs from Unit 1 (H1) and Unit 2 (H2) used to determine the hourly combined emission rate for Units 1 and 2 (EC) in Section 3.3.1 are calculated using CEM data for each respective stack as follows:

4.5.1 The hourly SO_2 mass emission from each respective stack is determined as follows:

E=(C) (F) (D) (K)

Where:

E=SO_2 mass emission from the respective stack in lb per hour

C=SO_2 concentration from the respective stack ppm

F=flue gas flow rate from the respective stack in scfm

D=density of SO_2 in lb per standard cubic feet

K=time conversion, 60 mins./hr

4.5.2 The hourly heat input from each respective stack is determined as follows:

H=[(F) (C) (K)/(F_c)

where:

H=heat input from the respective stack in MMBTU per hour

C=CO_2 or O_2 concentration from the respective stack as a decimal

F=flue gas flow rate from the respective stack in scfm

K=time conversion, 60 mins./hr

F_c=fuel constant for the appropriate diluent in scf/MMBTU as per §§60.45(f) (4) and (5)

4.5.3 The hourly SO_2 mass emission for Unit 1 in pounds per hour (E1) is calculated as follows, when leakage or diversion of any DAFGDS inlet gas to the bypass stack occurs:

E1=(EF)+(EB)

Where:

EF=Hourly SO_2 mass emission measured in DAFGDS stack, lb/hr, using the calculation in Section 4.5.1.

EB=Hourly SO_2 mass emission measured in bypass stack, lb/hr, using the calculation in Section 4.5.1.

Other than during conditions under 3.5.1, 3.5.2, 3.5.3, 3.5.4, or 4.8.2, the DAFGDS bypass damper must be fully closed and any leakage will be indicated by the bypass stack volumetric flow and SO_2 measurements, and when no leakage through the bypass damper is indicated:

E1=EF

4.5.4 The hourly heat input for Unit 1 in MMBTU per hour (H1) is calculated as follows, when leakage or diversion of any DAFGDS inlet gas to the bypass stack occurs:

H1=(HF)+(HB)

where:

HF=Hourly heat input as determined from the DAFGDS stack CEMs, in MMBTU per hour, using the calculation in Section 4.5.2

HB=Hourly heat input as determined from the DAFGDS bypass stack CEMs, in MMBTU per hour, using the calculation in Section 4.5.2

4.6 For the CEMs required for Unit 1 and Unit 2, the owner or operator of the affected facility shall maintain and operate the CEMs and obtain combined emission data values (EC) for at least 75 percent of the boiler operting hours per day for at least 26 out of each 30 successive boiler operating days.

4.6.1 When hourly SO_2 emission data are not obtained by the CEMs because of CEMs breakdowns, repairs, calibration checks and zero and span adjustment, hourly emission data required by 4.6 are obtained by using Methods 6 or 6C and 3 or 3A, 6A, or 8 and 3, or by other alternative methods approved by the Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA. Failure to obtain the minimum data requirements of 4.6 by CEMs, or by CEMs supplemented with alternative methods of this section, is a violation of performance testing requirements.

4.6.2 Independent of complying with the minimum data requirements of 4.6, all valid emissions data collected are used to calculate combined hourly emission rates (EC) and 30-day rolling average emission rates (E30) are calculated and used to judge compliance with 60.43(e).

4.7 For each continuous emission monitoring system, a quality control plan shall be prepared by CIPS and submitted to the Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA. The plan is to be submitted to the Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA 45 days before initiation of the initial performance test. At a minimum, the plan shall contain the following quality control elements:

4.7.1 Calibration of continuous emission monitoring systems (CEMs) and volumetric flow measurement devices.

4.7.2 Calibration drift determination and adjustment of CEMs and volumetric flow measurement devices.

4.7.3 Periodic CEMs, volumetric flow measurement devices and relative accuracy determinations.

4.7.4 Preventive maintenance of CEMs and volumetric flow measurement devices (including spare parts inventory).

4.7.5 Data recording and reporting.

4.7.6 Program of corrective action for malfunctioning CEMs and volumetric flow measurement devices.

4.7.7 Criteria for determining when the CEMs and volumetric flow measurement devices are not producing valid data.

4.7.8 Calibration and periodic checks of monitoring devices identified in 4.4.2.

4.8 For the purpose of conducting the continuous emission monitoring system performance specification tests as required by §60.13 and appendix B, the following conditions apply:

4.8.1 The calibration drift specification of Performance Specification 2, appendix B shall be determined separately for each of the Unit 1 SO_2 CEMs and the Unit 2 SO_2 CEMs. The calibration drift specification of Performance Specification 3, appendix B shall be determined separately for each of the Unit 1 diluent CEMs and Unit 2 diluent CEMs.

4.8.2 The relative accuracy of the combined SO_2 emission rate for Unit 1 and Unit 2, as calculated from CEMs and volumetric flow data using the procedures in 3.3.1, 4.5.1, 4.5.2 and 4.5.3 shall be no greater than 20 percent of the mean value of the combined emission rate, as determined from testing conducted simultaneously on the DAFGDS stack, the DAFGDS bypass stack and the Unit 2 stack using reference methods 2, 3, or 3A and 6 or 6C, or shall be no greater than 10 percent of the emission limit in §60.43(e), whichever criteria is less stringent. The relative accuracy shall be computed from at least nine comparisons of the combined emission rate values using the procedures in section 7 and the equations in section 8, Performance Specification 2, appendix B. Throughout, but only during, the relative accuracy test period the DAFGDS bypass damper shall be partially opened such that there is a detectable flow.

4.8.3—4.8.3.4 [Reserved]

4.9 The total monitoring system required by 4.2 shall be subject only to an annual relative accuracy test audit (RATA) in accordance with the quality assurance requirements of section 5.1.1 of 40 CFR part 60, appendix F. Each SO_2 and diluent CEMs shall be subject to cylinder gas audits (OGA) in accordance with the quality assurance requirements of section 5.1.2 of appendix F with the exception that any SO_2 or diluent CEMs without any type of probe or sample line shall be exempt from the OGA requirements.

5. Recordkeeping Requirements

5.1 The plant owner or operator shall keep a record of each hourly emission rate, each hourly SO_2 CEMs value and hourly flow rate value, and each hourly Btu heat input rate, hourly steam rate, or hourly electrical power output, and a record of each hourly weighted average emission rate. These records shall be kept for all periods of operation of Unit 1 or 2 under provisions of §60.43(e), including operations of Unit 1 (E1) during periods of DAFGDS startup, shutdown, and malfunction when H1 and E1 are assumed to be zero (0) (see 4.5).

5.2 The plant owner or operator shall keep a record of each hourly gas flow rate through the DAFGDS stack, each hourly stack gas flow rate through the bypass stack during any periods that the DAFGDS bypass damper is opened or flow is indicated, and reason for bypass operation.

6. Reporting Requirements

6.1 The owner or operator of any affected facility shall submit the written reports required under 6.2 of this section and subpart A to the Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA for every calendar quarter. All quarterly reports shall be submitted by the 30th day following the end of each calendar quarter.

6.2 For sulfur dioxide, the following data resubmitted to the Regional Administrator of the USEPA, Region 5 and the Director, of the IEPA for each 24-hour period:

6.2.1 Calendar date

6.2.2 The combined average sulfur dioxide emission rate (ng/J or lb/million Btu) for the past 30 successive boiler operating days (ending with the last 30-day period in the quarter); and, for any noncompliance periods, reasons for noncompliance with the emission standards and description of corrective action taken.

6.2.3 Identification of the boiler operating days for which valid sulfur dioxide emissions data required by 4.6 have not been obtained for 75 percent of the boiler operating hours; reasons for not obtaining sufficient data; and description of corrective actions taken to prevent recurrence.

6.2.4 Identification of the time periods (hours) when Unit 1 or Unit 2 were operated but combined hourly emission rates (EC) were not calculated because of the unavailability of parameters E1, E2, H1, or H2 as described in 3.2.

6.2.5 Identification of the time periods (hours) when Unit 1 and Unit 2 were operated and where the combined hourly emission rate (EC) equalled Unit 2 (E2/H2) emissions because of the Unit 1 malfunction provisions under 3.5.3, and 3.5.4.

6.2.6 Identification of the time periods (hours) when emissions from the Unit

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CONTENTS

LEGISLATIVE

SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION
Form #1

Jul 6 4 35 PM '94
OFFICE OF WEST VIRGINIA SECRETARY OF STATE

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: West Virginia Division of Environmental Protection, Office of Air Quality — TITLE NUMBER: 45CSR36

RULE TYPE: Legislative ; CITE AUTHORITY W. Va. Code §§22-5-1 et seq.

AMENDMENT TO AN EXISTING RULE: YES ___ NO X

IF YES, SERIES NUMBER OF RULE BEING AMENDED: ___

TITLE OF RULE BEING AMENDED: ___

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: 45CSR36

TITLE OF RULE BEING PROPOSED: "Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans".

DATE OF PUBLIC HEARING: August 9, 1994 TIME: 9:00 a.m.

LOCATION OF PUBLIC HEARING: Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

COMMENTS LIMITED TO: ORAL ___, WRITTEN ___, BOTH X

COMMENTS MAY ALSO BE MAILED TO THE FOLLOWING ADDRESS: Same as above.

The Department requests that persons wishing to make comments at the hearing make an effort to submit written comments in order to facilitate the review of these comments.

The issues to be heard shall be limited to the proposed rule.

ATTACH A BRIEF SUMMARY OF YOUR PROPOSAL

5.60

SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION
Form #1

FILED
Jul 6 4 35 PM '94
OFFICE OF WEST VIRGINIA SECRETARY OF STATE

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: West Virginia Division of Environmental Protection, Office of Air Quality — TITLE NUMBER: 45CSR37

RULE TYPE: Legislative ; CITE AUTHORITY W. Va. Code §§22-5-1 et seq.

AMENDMENT TO AN EXISTING RULE: YES ___ NO X

IF YES, SERIES NUMBER OF RULE BEING AMENDED: ___

TITLE OF RULE BEING AMENDED: ___

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED: 45CSR37

TITLE OF RULE BEING PROPOSED: "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"

DATE OF PUBLIC HEARING: August 9, 1994 TIME: 9:00 a.m.

LOCATION OF PUBLIC HEARING: Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

COMMENTS LIMITED TO: ORAL ___, WRITTEN ___, BOTH X

COMMENTS MAY ALSO BE MAILED TO THE FOLLOWING ADDRESS: Same as above.

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The issues to be heard shall be limited to the proposed rule.

ATTACH A BRIEF SUMMARY OF YOUR PROPOSAL

Proposed Rules Filed for Public Hearing

AGENCY	RULE/TYPE	AUTHORITY	HEARING/COMMENT PERIOD/LOCATION
DEP-Air Quality (45-25)	To Prevent & Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities Legislative	§22-5-1	August 9, 1994, 9:00 a.m. Office of Air Quality 1558 Washington Street, E Charleston, WV 25311 Written Comments Same Address
DEP-Air Quality (45-36)	Requirements for Determining Conformity of Transportation Plans, Programs & Projects Developed, Funded or Approved Under Title 23 U.S>C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans Legislative	§22-5-1	August 9, 1994, 9:00 a.m. Hearing & Written Comments Same as Above
DEP-Air Quality (45-37)	Provisions to Control Sulfur Dioxide Emissions & Ambient Air Quality Levels of Sulfur Dioxide In Hancock County Legislative	§22-5-1	August 9, 1994, 9:00 a.m. Hearing & Written Comments Same as Above
DEP-Air Quality (45-38)	Provisions for Determination of Compliance with Air Quality Management Rules Legislative	§22-5-1	August 9, 1994, 9:00 a.m. Hearing & Written Comments Same as Above
Health (64-14)	Personal Care Home Licensure Legislative	§16-5C-5	July 27, 1994, 10:00 a.m. Days Inn Conference Center Flatwoods, WV Written Comments Through August 1, 1994 Kay Howard Regulatory Development Dept of Health & Human Resources Bldg. 3, Rm. 265, Capitol Complex Charleston, WV 25305
Health (64-14)	Residential Board & Care Homes Legislative	§16-5H-2	July 27, 1994, 1:30 p.m. Hearing & Written Comments Same as Above

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Library of the Office of Air Quality located at the address below on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

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45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

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After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Library of the Office of Air Quality located at the address below on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

Person Conducting Test _____ Analyzer Manufacturer _____

Affiliation _____ Model/Serial No. _____

Date _____ Location _____

Monitor Pathlength, L_1 _____ Emission Outlet Pathlength, L_2 _____

Monitoring System Output Pathlength Corrected? Yes _____ No _____

Upscale Calibration Value: Actual Optical Density (Opacity) _____ (____)

Path Adjusted Optical Density (Opacity) _____ (____)

Date	Time		Percent Opacity										Alignment	
			Zero Reading*		Zero Drift	Zero adjusted?	Upscale Calibration Reading		Upscale Drift	Calibration Drift	Span adjusted?	Limits checked?	Checked?	Adjusted?
	Begin	End	Initial A	Final B	C = B–A		Initial D	Final E	F = E–D	G = F–C**				

Arithmetic Mean	(Eq. 1-2)		Arithmetic Mean (Eq. 1-2)
Confidence Coefficient	(Eq. 1-4)		Confidence Coefficient (Eq. 1-4)
Zero Drift	(Eq. 1-5)		Calibration Drift (Eq. 1-5)

* without automatic zero compensation

** if zero was adjusted (manually or automatically) prior to upscale check, then use C = 0.

Figure 1-8. Zero calibration drift determination.

7.4.2 Upscale Drift Test. At each 24-hour interval, after the zero calibration value has been checked and any optional or required adjustments have been made, check and record the simulated upscale calibration value. If no further adjustments are made to the calibration system at this time, record the final upscale calibration value as the initial upscale value for the next 24-hour period. If an instrument span adjustment is made, record the upscale value after adjustment as the initial upscale value for the next 24-hour period. From the initial and final upscale readings, calculate the upscale calibration drift for each 24-hour period. Then calculate the arithmetic mean, standard deviation, and confidence coefficient of the 24-hour calibration drift and the 95 percent confidence interval using Equations 1–2, 1–3, and 1–4. Calculate the sum of the absolute value of the mean and the absolute value of the confidence coefficient, and report this value as the 24-hour calibration drift.

8. *Equations*

8.1 Arithmetic Mean. Calculate the mean, $\bar{x}$, of a set of data as follows:

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i \qquad \text{(Eq. 1–2)}$$

where:

n=Number of data points.

$\sum_{i=1}^{n} x_i$=Algebraic sum of the individual measurements x_i.

8.2 Standard Deviation. Calculate the standard deviation S_d as follows:

$$S_d = \sqrt{\frac{\sum_{i=1}^{n} x_i^2 - \frac{\left(\sum_{i=1}^{n} x_i\right)^2}{n}}{n-1}} \qquad \text{(Eq. 1–3)}$$

8.3 Confidence Coefficient. Calculate the 2.5 percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}} \qquad \text{Eq. 1–4}$$

Where:

$t_{0.975}$=t-value (see Table 1–3).

8.4 Error. Calculate the error (i.e., calibration error, zero drift, and calibration drift), Er, as follows:

$$Er = |\bar{x}| + |CC| \qquad \text{(Eq. 1–5)}$$

TABLE 1–3—t-VALUES

n*	$t_{0.975}$	n*	$t_{0.975}$	n*	$t_{0.975}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

*The values in this table are already corrected for n–1 degrees of freedom. Use n equal to the number of individual values.

8.5 Conversion of Opacity Values from Monitor Path Length to Emission Outlet Path Length. When the monitor path length is different than the emission outlet path length, use either of the following equations to convert from one basis to the other (this conversion may be automatically calculated by the monitoring system):

$$\log(1-Op_2) = (L_2/L_1)\log(1-Op_1) \qquad \text{(Eq. 1–6)}$$

$$D_2 = (L_2/L_1)D_1 \qquad \text{(Eq. 1–7)}$$

Where:

Op_1 = Opacity of the effluent based upon L_1.
Op_2 = Opacity of the effluent based upon L_2.
L_1 = Monitor path length.
L_2 = Emission outlet path length.
D_1 = Optical density of the effluent based upon L_1.
D_2 = Optical density of the effluent based upon L_2.

9. *Reporting*

Report the following (summarize in tabular form where appropriate).

9.1 General Information.

a. Facility being monitored.
b. Person(s) responsible for operational and conditioning test periods and affiliation.
c. Instrument manufacturer.
d. Instrument model number
e. Instrument serial number.
f. Month/year manufactured.
g. Schematic of monitoring system measurement path location.
h. Monitor pathlength, meters.
i. Emission outlet pathlength, meters.
j. System span value, percent opacity.
k. Upscale calibration value, percent opacity.
l. Calibrated Attenuator values (low, mid, and high range), percent opacity.

9.2 Design Specification Test Results.

a. Peak spectral response, nm.
b. Mean spectral response, nm.
c. Response above 700 nm, percent of peak.
d. Response below 400 nm, percent of peak.
e. Total angle of view, degrees.
f. Total angle of projection, degrees.
g. Results of optical alignment sight test.
h. Serial number, month/year of manufacturer for unit actually tested to show design conformance.

9.3 Performance Specification Test Results.

a. Calibration error, high-range, percent opacity.

b. Calibration error, mid-range, percent opacity.

c. Calibration error, low-range, percent opacity.

d. Response time, seconds.

e. 24-hour zero drift, percent opacity.

f. 24-hour calibration drift, percent opacity.

g. Lens cleanings, clock time.

h. Optical alignment adjustments, clock time.

9.4 Statements. Provide a statement that the conditioning and operational test periods were completed according to the requirements of Sections 7.3 and 7.4. In this statement, include the time periods during which the conditioning and operational test periods were conducted.

9.5 Appendix. Provide the data tabulations and calculations for the above tabulated results.

10. *Retest*

If the CEMS operates within the specified performance parameters of Table 1–1, the PS tests will be successfully concluded. If the CEMS fails one of the preliminary tests, make the necessary corrections and repeat the performance testing for the failed specification prior to conducting the operational test period. If the CEMS fails to meet the specifications for the operational test period, make the necessary corrections and repeat the operational test period; depending on the correction made, it may be necessary to repeat the design and preliminary performance tests.

11. *Bibliography*

1. Experimental Statistics. Department of Commerce. National Bureau of Standards Handbook 91. Paragraph 3–3.1.4 1963. pp. 3–31.

12. Performance Specifications for Stationary-Source Monitoring Systems for Gases and Visible Emissions. U.S. Environmental Protection Agency. Research Triangle Park, NC. EPA–650/2–74–013. January 1974.

PERFORMANCE SPECIFICATION 2—SPECIFICATIONS AND TEST PROCEDURES FOR SO_2 AND NO_x CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

1. *Applicability and Principle*

1.1 Applicability. This specification is to be used for evaluating the acceptability of SO_2 and NO_x continuous emission monitoring systems (CEMS's) at the time of or soon after installation and whenever specified in the regulations. The CEMS may include, for certain stationary sources, a diluent (O_2 or CO_2) monitor.

This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess the CEMS performance. The source owner or operator, however, is responsible to properly calibrate, maintain, and operate the CEMS. To evaluate the CEMS performance, the Administrator may require, under Section 114 of the Act, the operator to conduct CEMS performance evaluations at other times besides the initial test. See § 60.13(c).

1.2 Principle. Installation and measurement location specifications, performance and equipment specifications, test procedures, and data reduction procedures are included in this specification. Reference method tests and calibration drift tests are conducted to determined conformance of the CEMS with the specification.

2. *Definitions*

2.1 Continuous Emission Monitoring System. The total equipment required for the determination of a gas concentration or emission rate. The system consists of the following major subsystems:

2.1.1 Sample Interface. That portion of the CEMS used for one or more of the following: sample acquisition, sample transportation, and sample conditioning, or protection of the monitor from the effects of the stack effluent.

2.1.2 Pollutant Analyzer. That portion of the CEMS that senses the pollutant gas and generates an output proportional to the gas concentration.

2.1.3 Diluent Analyzer (if applicable). That portion of the CEMS that senses the diluent gas (e.g., CO_2 or O_2) and generates an output proportional to the gas concentration.

2.1.4 Data Recorder. That portion of the CEMS that provides a permanent record of the analyzer output. The data recorder may include automatic data reduction capabilities.

2.2 Point CEMS. A CEMS that measures the gas concentration either at a single point or along a path equal to or less than 10 percent of the equivalent diameter of the stack or duct cross section.

2.3 Path CEMS. A CEMS that measures the gas concentration along a path greater than 10 percent of the equivalent diameter of the stack or duct cross section.

2.4 Span Value. The upper limit of a gas concentration measurement range specified for affected source categories in the applicable subpart of the regulations.

2.5 Relative Accuracy (RA). The absolute mean difference between the gas concentration or emission rate determined by the CEMS and the value determined by the RM's plus the 2.5 percent error confidence coefficient of a series of tests divided by the mean of the RM tests or the applicable emission limit.

2.6 Calibration Drift (CD). The difference in the CEMS output readings from the established reference value after a stated period of operation during which no unscheduled maintenance, repair, or adjustment took place.

2.7 Centroidal Area. A concentric area that is geometrically similar to the stack or duct cross section and is no greater than 1 percent of the stack or duct cross-sectional area.

2.8 Representative Results. As defined by the RM test procedure outlined in this specification.

3. *Installation and Measurement Location Specifications*

3.1 The CEMS Installation and Measurement Location. Install the CEMS at an accessible location where the pollutant concentration or emission rate measurements are directly representative or can be corrected so as to be representative of the total emissions from the affected facility or at the measurement location cross section. Then select representative measurement points or paths for monitoring in locations that the CEMS will pass the RA test (see Section 7). If the cause of failure to meet the RA test is determined to be the measurement location and a satisfactory correction technique cannot be established, the Administrator may require the CEMS to be relocated.

Suggested measurement locations and points or paths that are most likely to provide data that will meet the RA requirements are listed below.

3.1.1 Measurement Location. It is suggested that the measurement location be (1) at least two equivalent diameters downstream from the nearest control device, the point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate may occur and (2) at least a half equivalent diameter upstream from the effluent exhaust or control device.

3.1.2 Point CEMS. It is suggested that the measurement point be (1) no less than 1.0 meter from the stack or duct wall or (2) within or centrally located over the centroidal area of the stack or duct cross section.

3.1.3 Path CEMS. It is suggested that the effective measurement path (1) be totally within the inner area bounded by a line 1.0 meter from the stack or duct wall, or (2) have at least 70 percent of the path within the inner 50 percent of the stack or duct cross-sectional area, or (3) be centrally located over any part of the centroidal area.

3.2 Reference Method (RM) Measurement Location and Traverse Points. Select, as appropriate, an accessible RM measurement point at least two equivalent diameters downstream from the nearest control device, the point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate may occur, and at least a half equivalent diameter upstream from the effluent exhaust or control device. When pollutant concentration changes are due solely to diluent leakage (e.g., air heater leakages) and pollutants and diluents are simultaneously measured at the same location, a half diameter may be used in lieu of two equivalent diameters. The CEMS and RM locations need not be the same.

Then select traverse points that assure acquisition of representative samples over the stack or duct cross section. The minimum requirements are as follows: Establish a "measurement line" that passes through the centroidal area and in the direction of any expected stratification. If this line interferes with the CEMS measurements, displace the line up to 30 cm (or 5 percent of the equivalent diameter of the cross section, whichever is less) from the centroidal area. Locate three traverse points at 16.7, 50.0, and 83.3 percent of the measurement line. If the measurement line is longer than 2.4 meters and pollutant stratification is not expected, the tester may choose to locate the three traverse points on the line at 0.4, 1.2, and 2.0 meters from the stack or duct wall. This option must not be used after wet scrubbers or at points where two streams with different pollutant concentrations are combined. The tester may select other traverse points, provided that they can be shown to the satisfaction of the Administrator to provide a representative sample over the stack or duct cross section. Conduct all necessary RM tests within 3 cm (but no less than 3 cm from the stack or duct wall) of the traverse points.

4. *Performance and Equipment Specifications*

4.1 Data Recorder Scale. The CEMS data recorder response range must include zero and a high-level value. The high-level value is chosen by the source owner or operator and is defined as follows:

For a CEMS intended to measure an uncontrolled emission (e.g., SO_2 measurements at the inlet of a flue gas desulfurization unit), the high-level value must be between 1.25 and 2 times the average potential emission level, unless otherwise specified in an applicable subpart of the regulations. For a CEMS installed to measure controlled emissions or emissions that are in compliance with an applicable regulation, the high-level value must be between 1.5 times the pollutant concentration corresponding to the emission standard level and the span value. If a lower high-level value is used, the source must have the capability of measuring emissions which exceed the full-scale limit of the CEMS in accordance with the requirements of applicable regulations.

The data recorder output must be established so that the high-level value is read between 90 and 100 percent of the data recorder

full scale. (This scale requirement may not be applicable to digital data recorders.) The calibration gas, optical filter, or cell values used to establish the data recorder scale should produce the zero and high-level values. Alternatively, a calibration gas, optical filter, or cell value between 50 and 100 percent of the high-level value may be used in place of the high-level value provided the data recorder full-scale requirements as described above are met.

The CEMS design must also allow the determination of calibration drift at the zero and high-level values. If this is not possible or practical, the design must allow these determinations to be conducted at a low-level value (zero to 20 percent of the high-level value) and at a value between 50 and 100 percent of the high-level value. In special cases, if not already approved, the Administrator may approve a single-point calibration-drift determination.

4.2 Calibration Drift. The CEMS calibration must not drift or deviate from the reference value of the gas cylinder, gas cell, or optical filter by more than 2.5 percent of the span value. If the CEMS includes pollutant and diluent monitors, the calibration drift must be determined separately for each in terms of concentrations (see PS 3 for the diluent specifications).

4.3 The CEMS RA. The RA of the CEMS must be no greater than 20 percent of the mean value of the RM test data in terms of the units of the emission standard or 10 percent of the applicable standard, whichever is greater. For SO_2 emission standards between 130 and 86 ng/J (0.30 and 0.20 lb/million Btu), use 15 percent of the applicable standard; below 86 ng/J (0.20 lb/million Btu), use 20 percent of emission standard.

5. *Performance Specification Test Procedure*

5.1 Pretest Preparation. Install the CEMS, prepare the RM test site according to the specifications in Section 3, and prepare the CEMS for operation according to the manufacturer's written instructions.

5.2 Calibration Drift Test Period. While the affected facility is operating at more than 50 percent of normal load, or as specified in an applicable subpart, determine the magnitude of the calibration drift (CD) once each day (at 24-hour intervals) for 7 consecutive days according to the procedure given in Section 6. To meet the requirement of Section 4.2, none of the CD's must exceed the specification.

5.3 RA Test Period. Conduct the RA test according to the procedure given in Section 7 while the affected facility is operating at more than 50 percent or normal load, or as specified in an applicable subpart. To meet the specifications, the RA must be equal to or less than 20 percent of the mean value of the RM test data in terms of the units of the emission standard or 10 percent of the applicable standard, whichever is greater. For instruments that use common components to measure more than one effluent gas constituent, all channels must simultaneously pass the RA requirement, unless it can be demonstrated that any adjustments made to one channel did not affect the others.

The RA test may be conducted during the CD test period.

6. *The CEMS Calibration Drift Test Procedure*

The CD measurement is to verify the ability of the CEMS to conform to the established CEMS calibration used for determining the emission concentration or emission rate. Therefore, if periodic automatic or manual adjustments are made to the CEMS zero and calibration settings, conduct the CD test immediately before these adjustments, or conduct it in such a way that the CD can be determined.

Conduct the CD test at the two points specified in Section 4.1. Introduce to the CEMS the reference gases, gas cells, or optical filters (these need not be certified). Record the CEMS response and subtract this value from the reference value (see example data sheet in Figure 2–1).

7. *Relative Accuracy Test Procedure*

7.1 Sampling Strategy for RM Tests. Conduct the RM tests in such a way that they will yield results representative of the emissions from the source and can be correlated to the CEMS data. Although it is preferable to conduct the diluent (if applicable), moisture (if needed), and pollutant measurements simultaneously, the diluent and moisture measurements that are taken within a 30- to 60-minute period, which includes the pollutant measurements, may be used to calculate dry pollutant concentration and emission rate.

In order to correlate the CEMS and RM data properly, mark the beginning and end of each RM test period of each run (including the exact time of the day) on the CEMS chart recordings or other permanent record of output. Use the following strategies for the RM tests:

7.1.1 For integrated samples, e.g., Method 6 and Method 4, make a sample traverse of at least 21 minutes, sampling for 7 minutes at each traverse point.

7.1.2 For grab samples, e.g., Method 7, take one sample at each traverse point, scheduling the grab samples so that they are taken simultaneously (within a 3-minute period) or are an equal interval of time apart over a 21-minute (or less) period. A test run for grab samples must be made up of at least three separate measurements.

NOTE: At times, CEMS RA tests are conducted during new source performance standards performance tests. In these cases, RM results obtained during CEMS RA tests may be used to determine compliance as long as

the source and test conditions are consistent with the applicable regulations.

7.2 Correlation of RM and CEMS Data. Correlate the CEMS and the RM test data as to the time and duration by first determining from the CEMS final output (the one used for reporting) the integrated average pollutant concentration or emission rate for each pollutant RM test period. Consider system response time, if important, and confirm that the pair of results are on a consistent moisture, temperature, and diluent concentration basis. Then, compare each integrated CEMS value against the corresponding average RM value. Use the following guidelines to make these comparisons.

7.2.1 If the RM has an integrated sampling technique, make a direct comparison of the RM results and CEMS integrated average value.

7.2.2 If the RM has a grab sampling technique, first average the results from all grab samples taken during the test run and then compare this average value against the integrated value obtained from the CEMS chart recording or output during the run. If the pollutant concentration is varying with time over the run, the tester may choose to use the arithmetic average of the CEMS value recorded at the time of each grab sample.

7.3 Number of RM Tests. Conduct a minimum of nine sets of all necessary RM tests. Conduct each set within a period of 30 to 60 minutes.

NOTE: The tester may choose to perform more than nine sets of RM tests. If this option is chosen, the tester may, at his discretion, reject a maximum of three sets of the test results so long as the total number of test results used to determine the RA is greater than or equal to nine, but he must report all data including the rejected data.

7.4 Reference Methods. Unless otherwise specified in an applicable subpart of the regulations, Methods 3B, 4, 6, and 7, or their approved alternatives, are the reference methods for diluent (O_2 and CO_2), moisture, SO_2, and NO_x, respectively.

7.5 Calculations. Summarize the results on a data sheet. An example is shown in Figure 2–2. Calculate the mean of the RM values. Calculate the arithmetic differences between the RM and the CEMS output sets. Then calculate the mean of the difference, standard deviation, confidence coefficient, and CEMS RA, using Equations 2–1, 2–2, 2–3, and 2–4.

8. *Equations*

8.1 Arithmetic Mean. Calculate the arithmetic mean of the difference, d, of a data set as follows:

$$\bar{d} = \frac{1}{n}\sum_{i=1}^{n} d_i \qquad \text{(Eq. 2–1)}$$

Where:

n=Number of data points.

$\sum_{i=1}^{n} d_i$ = Algebraic sum of the individual differences d_i.

When the mean of the differences of pairs of data is calculated, be sure to correct the data for moisture, if applicable.

8.2 Standard Deviation. Calculate the standard deviation, S_d, as follows:

$$S_d = \left[\frac{\sum_{i=1}^{n} d_i^2 - \frac{\left(\sum_{i=1}^{n} d_i\right)^2}{n}}{n-1}\right]^{1/2} \qquad \text{(Eq. 2–2)}$$

8.3 Confidence Coefficient. Calculate the 2.5 percent error confidence coefficient (one-tailed), CC, as follows:

$$CC = t_{0.975}\frac{S_d}{\sqrt{n}} \qquad \text{Eq. 2–3}$$

Where:

$t_{0.975}$=t-value (see Table 2–1)

TABLE 2–1—t-VALUES

n*	$t_{0.975}$	n*	$t_{0.975}$	n*	$t_{0.975}$
2	12.706	7	2.447	12	2.201
3	4.303	8	2.365	13	2.179
4	3.182	9	2.306	14	2.160
5	2.776	10	2.262	15	2.145
6	2.571	11	2.228	16	2.131

*The values in this table are already corrected for n-1 degrees of freedom. Use n equal to the number of individual values.

8.4 Relative Accuracy. Calculate the RA of a set of data as follows:

$$RA = \frac{|\bar{d}| + |CC|}{\bar{RM}} \times 100 \qquad \text{(Eq. 2–4)}$$

Where:

$|\bar{d}|$=Absolute value of the mean of differences (from Equation 2–1).

|CC|=Absolute value of the confidence coefficient (from Equation 2–3).

$\bar{RM}$=Average RM value or applicable standard.

9. *Reporting*

At a minimum (check with the appropriate regional office, or State, or local agency for additional requirements, if any) summarize in tabular form the results of the CD tests and the relative accuracy tests or alternative RA procedure as appropriate. Include all data sheets, calculations, charts (records of CEMS responses), cylinder gas concentration certifications, and calibration cell response certifications (if applicable), necessary to substantiate that the performance

of the CEMS met the performance specifications.

10. *Alternative Procedures*

10.1 Alternative to Relative Accuracy Procedure in section 7. Paragraphs 60.13(j) (1) and (2) contain criteria for which the reference method relative accuracy may be waived and the following procedure substituted.

10.1.1 Conduct a complete CEMS status check following the manufacturer's written instructions. The check should include operation of the light source, signal receiver, timing mechanism functions, data acquisition and data reduction functions, data recorders, mechanically operated functions (mirror movements, zero pipe operation, calibration gas valve operations, etc.), sample filters, sample line heaters, moisture traps, and other related functions of the CEMS, as applicable. All parts of the CEMS shall be functioning properly before proceeding to the alternative RA procedure.

10.1.2 Challenge each monitor (both pollutant and diluent, if applicable) with cylinder gases of known concentrations or calibration cells that produce known responses at two measurement points within the following ranges:

MEASUREMENT RANGE

Measurement point	Pollutant monitor	Diluent monitor for	
		CO_2	O_2
1	20–30 percent of span value.	5–8 percent by volume.	4–6 percent by volume.
2	50–60 percent of span value.	10–14 percent by volume.	8–12 percent by volume.

Use a separate cylinder gas or calibration cell for measurement points 1 and 2. Challenge the CEMS and record the responses three times at each measurement point. Do not dilute gas from a cylinder when challenging the CEMS. Use the average of the three responses in determining relative accuracy.

Operate each monitor in its normal sampling mode as nearly as possible. When using cylinder gases, pass the cylinder gas through all filters, scrubbers, conditioners, and other monitor components used during normal sampling and as much of the sampling probe as practical. When using calibration cells, the CEMS components used in the normal sampling mode should not be by-passed during the RA determination. These include light sources, lenses, detectors, and reference cells. The CEMS should be challenged at each measurement point for a sufficient period of time to assure adsorption-desorption reactions on the CEMS surfaces have stabilized.

Use cylinder gases that have been certified by comparison to National Bureau of Standards (NBS) gaseous standard reference material (SRM) or NBS/EPA-approved gas manufacturer's certified reference material (CRM) (See Citation 2 in the Bibliography) following EPA traceability protocol Number 1 (See Citation 3 in the Bibliography). As an alternative to protocol Number 1 gases, CRM's may be used directly as alternative RA cylinder gases. A list of gas manufacturers that have prepared approved CRM's is available from EPA at the address shown in Citation 2. Procedures for preparation of CRM are described in Citation 2.

Use calibration cells certified by the manufacturer to produce a known response in the CEMS. The cell certification procedure shall include determination of CEMS response produced by the calibration cell in direct comparison with measurement of gases of known concentration. This can be accomplished using SRM or CRM gases in a laboratory source simulator or through extended tests using reference methods at the CEMS location in the exhaust stack. These procedures are discussed in Citation 4 in the Bibliography. The calibration cell certification procedure is subject to approval of the Administrator.

10.1.3 The differences between the known concentrations of the cylinder gases and the concentrations indicated by the CEMS are used to assess the accuracy of the CEMS.

The calculations and limits of acceptable relative accuracy (RA) are as follows:

(a) For pollutant CEMS:

$$RA = \left| \frac{d}{AC} \times 100 \right| \leq 15 \text{ percent}$$

Where:

d=Difference between response and the known concentration/response.

AC=The known concentration/response of the cylinder gas or calibration cell.

(b) For diluent CEMS:

RA=|d| ≤ 0.7 percent O_2 or CO_2, as applicable.

NOTE: Waiver of the relative accuracy test in favor of the alternative RA procedure does not preclude the requirements to complete the calibration drift (CD) tests nor any other requirements specified in the applicable regulation(s) for reporting CEMS data and performing CEMS drift checks or audits.

	Day	Date and time	Calibration value	Monitor value	Difference	Percent of span value
Low-level						
High-level						

Figure 2-1. Calibration drift determination.

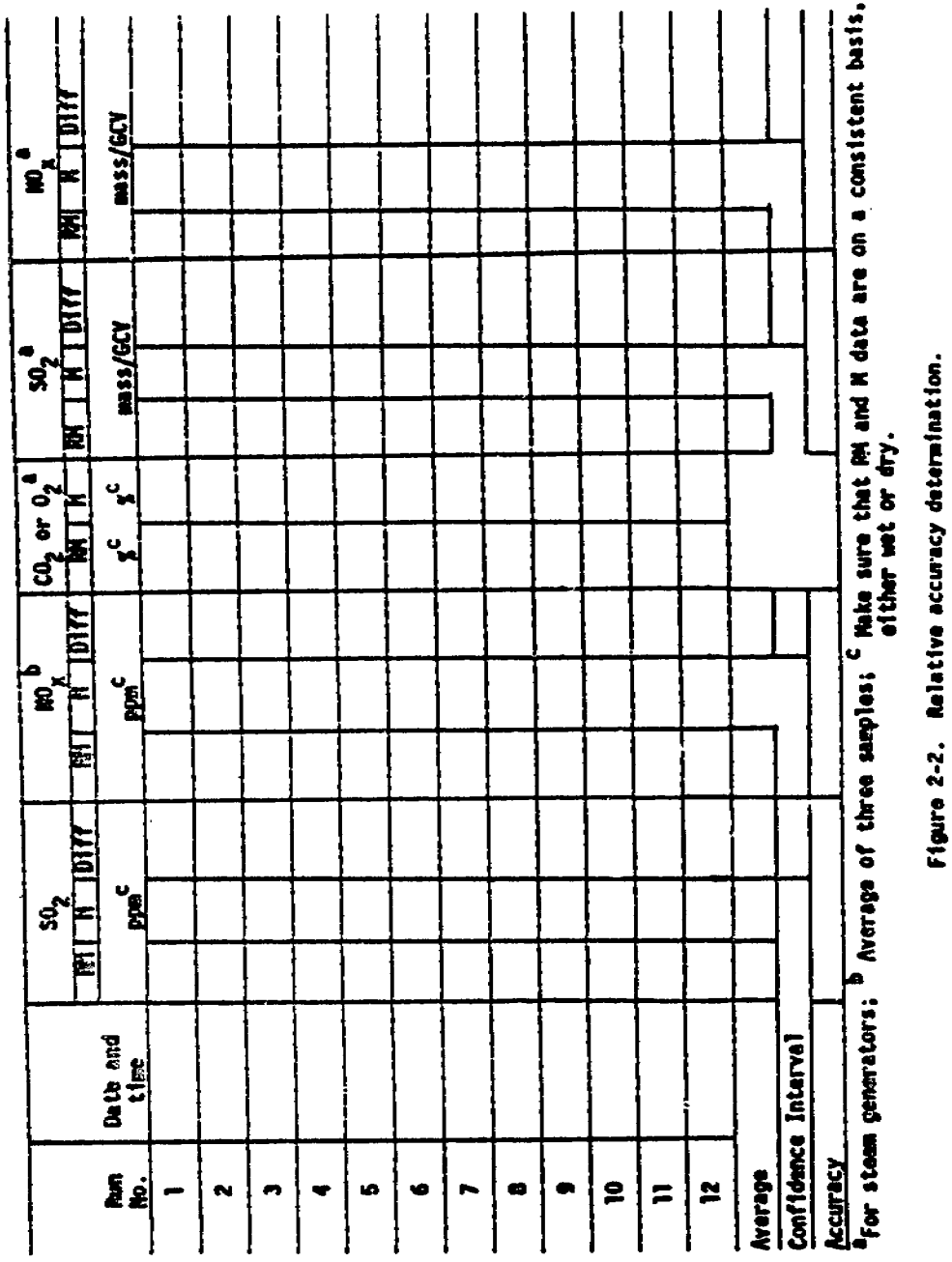

Figure 2-2. Relative accuracy determination.

11. *Bibliography*

1. Department of Commerce. Experimental Statistics. Handbook 91. Washington, DC. p. 3–31, paragraphs 3–3.1.4.

2. "A Procedure for Establishing Traceability of Gas Mixtures to Certain National Bureau of Standards Standard Reference Materials." Joint publication by NBS and EPA. EPA–600/7–81–010. Available from U.S. Environmental Protection Agency, Quality Assurance Division (MD–77), Research Triangle Park, NC 27711.

3. "Traceability Protocol for Establishing True Concentrations of Gases Used for Calibration and Audits of Continuous Source Emission Monitors. (Protocol Number 1)." June 1978. Protocol Number 1 is included in the *Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods.* EPA–600/4–77–027b. August 1977. Volume III is available from the U.S. EPA, Office of Research and Development Publications, 26 West St. Clair Street, Cincinnati, OH 45268.

4. "Gaseous Continuous Emission Monitoring Systems—Performance Specification Guidelines for SO_2, NO_x, CO_2, O_2, and TRS." EPA–450/3–82–026. Available from U.S. Environmental Protection Agency, Emission Standards and Engineering Division (MD–19), Research Triangle Park, NC 27711.

Performance Specification 3—Specifications and Test Procedures for O_2 and CO_2 Continuous Emission Monitoring Systems in Stationary Sources

1. *Applicability and Principle*

1.1 Applicability. This specification is to be used for evaluating acceptability of O_2 and CO_2 continuous emission monitoring systems (CEM's) at the time of or soon after installation and whenever specified in an applicable subpart of the regulations. The specification applies to O_2 or CO_2 monitors that are not included under Performance Specification 2 (PS 2).

This specification is not designed to evaluate the installed CEMS performance over an extended period of time, nor does it identify specific calibration techniques and other auxiliary procedures to assess the CEMS performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS properly. To evaluate the CEMS performance, the Administrator may require, under Section 114 of the Act, the operator to conduct CEMS performance evaluations in addition to the initial test. See Section 60.13(c).

The definitions, installation and measurement location specifications, test procedures, data reduction procedures, reporting requirements, and bibliography are the same as in PS 2, Sections 2, 3, 5, 6, 8, 9, and 10, and also apply to O_2 and CO_2 CEMS's under this specification. The performance and equipment specifications and the relative accuracy (RA) test procedures for O_2 and CO_2 CEMS do not differ from those for SO_2 and NO_x CEMS, except as noted below.

1.2 Principle. Reference method (RM) tests and calibration drift tests are conducted to determine conformance of the CEMS with the specification.

2. *Performance and Equipment Specifications*

2.1 Instrument Zero and Span. This specification is the same as Section 4.1 of PS 2.

2.2 Calibration Drift. The CEMS calibration must not drift by more than 0.5 percent O_2 or CO_2 from the reference value of the gas, gas cell, or optical filter.

2.3 The CEMS RA. The RA of the CEMS must be no greater than 20 percent of the mean value of the RM test data or 1.0 percent O_2 or CO_2, whichever is greater.

3. *Relative Accuracy Test Procedure*

3.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data, Number of RM Tests, and Calculations. This is the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively.

3.2 Reference Method. Unless otherwise specified in an applicable subpart of the regulations, Method 3B of appendix A or any approved alternative is the RM for O_2 or CO_2.

Performance Specification 4—Specifications and Test Procedures for Carbon Monoxide Continuous Emission Monitoring Systems in Stationary Sources

1. *Applicability and Principle*

1.1 Applicability. This specification is to be used for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS) at the time of or soon after installation and whenever specified in an applicable subpart of the regulations.

This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess CEMS performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS. To evaluate CEMS performance, the Administrator may require, under section 114 of the Act, the source owner or operator to conduct CEMS performance evaluations at other times besides the initial test. See §60.13(c).

The definitions, installation specifications, test procedures, data reduction procedures for determining calibration drifts (CD) and relative accuracy (RA), and reporting of Performance Specification 2 (PS 2), Sections 2, 3, 5, 6, 8, and 9 apply to this specification.

1.2 Principle. Reference method (RM), CD, and RA tests are conducted to determine that the CEMS conforms to the specification.

2. *Performance and Equipment Specifications*

2.1 Instrument Zero and Span. This specification is the same as Section 4.1 of PS 2.

2.2 Calibration Drift. The CEMS calibration must not drift or deviate from the reference value of the calibration gas, gas cell, or optical filter by more than 5 percent of the established span value for 6 out of 7 test days (e.g., the established span value is 1000 ppm for subpart J affected facilities).

2.3 Relative Accuracy. The RA of the CEMS shall be no greater than 10 percent of the mean value of the RM test data in terms of the units of the emission standard or 5 percent of the applicable standard, whichever is greater.

3. *Relative Accuracy Test Procedure*

3.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data, Number of RM Tests, and Calculations. These are the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively.

3.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulation, Method 10 is the RM for this PS. When evaluating nondispersive infrared continuous emission analyzers, Method 10 shall use the alternative interference trap specified in section 10.1 of the method. Method 10A or 10B is an acceptable alternative to method 10.

4. *Bibliography*

1. Ferguson, B.B., R.E. Lester, and W.J. Mitchell. Field Evaluation of Carbon Monoxide and Hydrogen Sulfide Continuous Emission Monitors at an Oil Refinery. U.S. Environmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–600/4–82–054. August 1982. 100 p.

2. Repp, M. Evaluation of Continuous Monitors for Carbon Monoxide in Stationary Sources. U.S. Environmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–600/2–77–063. March 1977/ 155 p.

3. Smith, F., D.E. Wagoner, and R.P. Donovan. Guidelines for Development of a Quality Assurance Program: Volume VIII—Determination of CO Emissions from Stationary Sources by NDIR Spectrometry. U.S. Environmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–650/4–74–005–h. February 1975. 96 p.

Performance Specification 4A—Specifications and Test Procedures For Carbon Monoxide Continuous Emission Monitoring Systems in Stationary Sources

1. Applicability and Principle

1.1 Applicability.

1.1.1 This specification is to be used for evaluating the acceptability of carbon monoxide (CO) continuous emission monitoring systems (CEMS's) at the time of or soon after installation and whenever specified in an applicable subpart of the regulations.

1.1.2 This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess CEMS performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS. To evaluate CEMS performance, the Administrator may require, under section 114 of the Act, the source owner or operator to conduct CEMS performance evaluations at other times besides the initial test. See §60.13(c).

1.1.3 The definition, installation specifications, test procedures, data reduction procedures for determining calibration drifts (CD) and relative accuracy (RA), and reporting of Performance Specification 2 (PS 2), sections 2, 3, 5, 6, 8, and 9 apply to this specification.

1.2 Principle. Reference method (RM), CD and RA tests are conducted to determine that the CEMS conforms to the specification.

2. Performance and Equipment Specifications

2.1 Data Recorder Scale. This specification is the same as section 4.1 of PS 2. The CEMS shall be capable of measuring emission levels under normal conditions and under periods of short-duration peaks of high concentrations. This dual-range capability may be met using two separate analyzers, one for each range, or by using dual-range units which have the capability of measuring both levels with a single unit. In the latter case, when the reading goes above the full-scale measurement value of the lower range, the higher-range operation shall be started automatically. The CEMS recorder range must include zero and a high-level value.

For the low-range scale, the high-level value shall be between 1.5 times the pollutant concentration corresponding to the emission standard level and the span value. For the high-range scale, the high-level value shall be set at 2000 ppm, as a minimum, and the range shall include the level of the span value. There shall be no concentration gap between the low- and high-range scales.

2.2 Interference Check. The CEMS must be shown to be free from the effects of any interferences.

2.3 Response Time. The CEMS response time shall not exceed 1.5 min to achieve 95 percent of the final stable value.

2.4 Calibration Drift. The CEMS calibration must not drift or deviate from the reference value of the calibration gas, gas cell, or optical filter by more than 5 percent of the established span value for 6 out of 7 test days.

2.5 Relative Accuracy. The RA of the CEMS shall be no greater than 10 percent of the mean value of the RM test data in terms of the units of the emission standard or 5 ppm, whichever is greater. Under conditions where the average CO emissions are less than 10 percent of the standard, a cylinder gas audit may be performed in place of the RA test to determine compliance with these limits. In this case, the cylinder gas shall contain CO in 12 percent carbon dioxide as an interference check. If this option is exercised, Method 10 must be used to verify that emission levels are less than 10 percent of the standard.

3. Response Time Test Procedure

The response time test applies to all types of CEMS's, but will generally have significance only for extractive systems. The entire system is checked with this procedure including applicable sample extraction and transport, sample conditioning, gas analyses, and data recording.

Introduce zero gas into the system. For extractive systems, the calibration gases should be introduced at the probe as near to the sample location as possible. For in-situ systems, introduce the zero gas at the sample interface so that all components active in the analysis are tested. When the system output has stabilized (no change greater than 1 percent of full scale for 30 sec), switch to monitor stack effluent and wait for a stable value. Record the time (upscale response time) required to reach 95 percent of the final stable value. Next, introduce a high-level calibration gas and repeat the procedure (stabilize, switch the sample, stabilize, record). Repeat the entire procedure three times and determine the mean upscale and downscale response times. The slower or longer of the two means is the system response time.

4. Relative Accuracy Test Procedure

4.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data, Number of RM Tests, and Calculations. These are the same as PS 2, sections 7.1, 7.2, 7.3, and 7.5, respectively.

4.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulation, Method 10 is the RM for this PS. When evaluating nondispersive infrared continuous emission analyzers, Method 10 shall use the alternative interference trap specified in section 10.1 of the method. Method 10A or 10B is an acceptable alternative to Method 10.

5. Bibliography

1. Same as in Performance Specification 4, section 4.

2. "Gaseous Continuous Emission Monitoring Systems—Performance Specification Guidelines for SO_2, NO_x, CO_2, O_2, and TRS." EPA–450/3–82–026. U.S. Environmental Protection Agency, Technical Support Division (MD–19). Research Triangle Park, NC 27711.

Performance Specification 5—Specifications and Test Procedures for TRS Continuous Emission Monitoring Systems in Stationary Sources

1. *Applicability and Principle*

1.1 Applicability. This specification is to be used for evaluating the acceptability of total reduced sulfur (TRS) and whenever specified in an applicable subpart of the regulations. (At present, these performance specifications do not apply to petroleum refineries, subpart J.) Sources affected by the promulgation of the specification shall be allowed 1 year beyond the promulgation date to install, operate, and test the CEMS. The CEMS's may include O_2 monitors which are subject to Performance Specification 3 (PS 3).

The definitions, installation specifications, test procedures, and data reduction procedures for determining calibration drifts (CD's) and relative accuracy (RA), and reporting of PS 2, Sections 2, 3, 4, 5, 6, 8, and 9 also apply to this specification and must be consulted. The performance and equipment specifications do not differ from PS 2 except as listed below and are included in this specification.

1.2 Principle. The CD and RA tests are conducted to determine conformance of the CEMS with the specification.

2. *Performance and Equipment Specifications*

2.1 Instrument Zero and Span. The CEMS recorder span must be set at 90 to 100 percent of recorder full-scale using a span level between 1.5 times the pollutant concentration corresponding to the emission standard level and the span value. The CEMS design shall also allow the determination of calibration at the zero level of the calibration curve. If zero calibration is not possible or is impractical, this determination may be conducted at a low level (up to 20 percent of span value) point. The components of an acceptable permeation tube system are listed on pages 87–94 of Citation 4.2 of the Bibliography.

2.2 Calibration Drift. The CEMS detector calibration must not drift or deviate from the reference value of the calibration gas by more than 5 percent (1.5 ppm) of the established span value of 30 ppm for 6 out of 7 test days. If the CEMS includes pollutant and diluent monitors, the CD must be determined separately for each in terms of concentrations (see PS 3 for the diluent specifications).

2.3 The CEMS Relative Accuracy. The RA of the CEMS shall be no greater than 20 percent of the mean value of the reference method (RM) test data in terms of the units of the emission standard or 10 percent of the applicable standard, whichever is greater.

3. *Relative Accuracy Test Procedure*

3.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data, Number of

RM Tests, and Calculations. This is the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively. Note: For Method 16, a sample is made up of at least three separate injects equally spaced over time. For Method 16A, a sample is collected for at least 1 hour.

3.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulations, Method 16, Method 16A, or other approved alternative, shall be the RM for TRS.

4. Bibliography

1. Department of Commerce. Experimental Statistics. National Bureau of Standards. Handbook 91. 1963. Paragraphs 3–3.1.4, p. 3–31.

2. A Guide to the Design, Maintenance and Operation of TRS Monitoring Systems. National Council for Air and Stream Improvement Technical Bulletin No. 89. September 1977.

3. Observation of Field Performance of TRS Monitors on a Kraft Recovery Furnace. National Council for Air and Stream Improvement Technical Bulletin No. 91. January 1978.

PERFORMANCE SPECIFICATION 6—SPECIFICATIONS AND TEST PROCEDURES FOR CONTINUOUS EMISSION RATE MONITORING SYSTEMS IN STATIONARY SOURCES

1. Applicability and Principle

1.1 Applicability. The applicability for this specification is the same as Section 1.1 of Performance Specification 2 (PS 2), except this specification is to be used for evaluating the acceptability of continuous emission rate monitoring systems (CERMS's). The installation and measurement location specifications, performance specification test procedure, data reduction procedures, and reporting requirements of PS 2, Section 3, 5, 8, and 9, apply to this specification.

1.2 Principle. Reference method (RM), calibration drift (CD), and relative accuracy (RA) tests are conducted to determine that the CERMS conforms to the specification.

2. Definitions

The definitions are the same as in Section 2 of PS 2, except that this specification refers to the continuous emission rate monitoring system rather than the continuous emission monitoring system. The following definitions are added:

2.1 Continuous Emission Rate Monitoring System (CERMS). The total equipment required for the determination and recording of the pollutant mass emission rate (in terms of mass per unit of time).

2.2 Flow Rate Sensor. That portion of the CERMS that senses the volumetric flow rate and generates an output proportional to flow rate. The flow rate sensor shall have provisions to check the CD for each flow rate parameter that it measures individually (e.g., velocity pressure).

3. Performance and Equipment Specifications

3.1 Data Recorder Scale. Same as Section 4.1 of PS 2.

3.2 CD. Since the CERMS includes analyzers for several measurements, the CD shall be determined separately for each analyzer in terms of its specific measurement. The calibration for each analyzer used for the measurement of flow rate except a temperature analyzer shall not drift or deviate from either of its reference values by more than 3 percent of 1.25 times the average potential absolute value for that measurement. For a temperature analyzer, the specification is 1.5 percent of 1.25 times the average potential absolute temperature. The CD specification for each analyzer for which other PS's have been established (e.g., PS 2 for SO_2 and NO_x), shall be the same as in the applicable PS.

3.3 CERMS RA. The RA of the CERMS shall be no greater than 20 percent of the mean value of the RM's test data in terms of the units of the emission standard, or 10 percent of the applicable standard, whichever is greater.

4. CD Test Procedure

The CD measurements are to verify the ability of the CERMS to conform to the established CERMS calibrations used for determining the emission rate. Therefore, if periodic automatic or manual adjustments are made to the CERMS zero and calibration settings, conduct the CD tests immediately before these adjustments, or conduct them in such a way what CD can be determined.

Conduct the CD tests for pollutant concentration at the two values specified in Section 4.1 of PS 2. For each of the other parameters that are selectively measured by the CERMS (e.g., velocity pressure), use two analogous values: one that represents zero to 20 percent of the high-level value (a value that is between 1.25 and 2 times the average potential value) for that parameter, and one that represents 50 to 100 percent of the high-level value. Introduce, or activate internally, the reference signals to the CERMS (these need not be certified). Record the CERMS response to each, and subtract this value from the respective reference value (see example data sheet in Figure 6–1).

5. RA Test Procedure

5.1 Sampling Strategy for RM's Tests, Correlation of RM and CERMS Data, Number of RM's Tests, and Calculations. These are the same as PS 2, Sections 7.1, 7.2, 7.3, and 7.5, respectively. Summarize the results on a data sheet. An example is shown in Figure 6–2. The RA test may be conducted during the CD test period.

5.2 Reference Methods (RM's). Unless otherwise specified in the applicable subpart of the regulations, the RM for the pollutant gas is the appendix A method that is cited for compliance test purposes, or its approved alternatives. Methods 2, 2A, 2B, 2C, or 2D, as applicable are the RM's for the determination of volumetric flow rate.

6. Bibliography

1. Brooks, E.F., E.C. Beder, C.A. Flegal, D.J. Luciani, and R. Williams. Continuous Measurement of Total Gas Flow Rate from Stationary Sources. U.S. Envionmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–650/2–75–020. February 1975. 248 p.

PERFORMANCE SPECIFICATION 7—SPECIFICATIONS AND TEST PROCEDURES FOR HYDROGEN SULFIDE CONTINUOUS EMISSION MONITORING SYSTEMS IN STATIONARY SOURCES

1. Applicability and Principle

1.1 *Applicability.* 1.1.1 This specification is to be used for evaluating the acceptability of hydrogen sulfide (H_2S) continuous emission monitoring systems (CEMS's) at the time of or soon after installation and whenever specified in an applicable subpart of the regulations.

1.1.2 This specification is not designed to evaluate the installed CEMS performance over an extended period of time nor does it identify specific calibration techniques and other auxiliary procedures to assess CEMS performance. The source owner or operator, however, is responsible to calibrate, maintain, and operate the CEMS. To evaluate CEMS performance, the Administrator may require, under Section 114 of the Act, the source owner or operator to conduct CEMS performance evaluations at other times besides the initial test. *See* §60.13(c).

1.1.3 The definitions, installation specifications, test procedures, data reduction procedures for determining calibration drifts (CD) and relative accuracy (RA), and reporting of Performance Specification 2 (PS 2), Sections 2, 3, 5, 6, 8, and 9 apply to this specification.

1.2 Principle. Reference method (RM), CD, and RA tests are conducted to determine that the CEMS conforms to the specification.

2. Performance and Equipment Specifications

2.1 *Instrument zero and span.* This specification is the same as Section 4.1 of PS 2.

2.2 *Calibration drift.* The CEMS calibration must not drift or deviate from the reference value of the calibration gas or reference source by more than 5 percent of the established span value for 6 out of 7 test days (e.g., the established span value is 300 ppm for subpart J fuel gas combustion devices).

2.3 *Relative accuracy.* The RA of the CEMS shall be no greater than 20 percent of the mean value of the RM test data in terms of the units of the emission standard or 10 percent of the applicable standard, whichever is greater.

3. Relative Accuracy Test Procedure

3.1 Sampling Strategy for RM Tests, Correlation of RM and CEMS Data Number of RM Tests, and Calculations. These are the same as that in PS 2, §7.1, 7.2, 7.3, and 7.5, respectively.

3.2 Reference Methods. Unless otherwise specified in an applicable subpart of the regulation, Method 11 is the RM for this PS.

4. Bibliography

1. U.S. Environmental Protection Agency. Standards of Performance for New Stationary Sources; Appendix B; Performance Specifications 2 and 3 for SO_2, NO_x, CO_2, and O_2 Continuous Emission Monitoring Systems; Final Rule. 48 CFR 23608. Washington, DC, U.S. Government Printing Office. May 25, 1983.

2. U.S. Government Printing Office. Gaseous Continuous Emission Monitoring Systems—Performance Specification Guidelines for SO_2, NO_x, CO_2, O_2, and TRS. U.S. Environmental Protection Agency. Washington, DC, EPA–450/3–82–026. October 1982. 26p.

3. Maines, G.D., W.C. Kelly (Scott Environmental Technology, Inc.), and J.B. Homolya. Evaluation of Monitors for Measuring H_2S in Refinery Gas. Prepared for the U.S. Environmental Protection Agency. Research Triangle Park, NC, Contract No. 68–02–2707. 1978. 60 p.

4. Ferguson, B.B., R.E. Lester (Harmon Engineering and Testing), and W.J. Mitchell. Field Evaluation of Carbon Monoxide and Hydrogen Sulfide Continuous Emission Monitors at an Oil Refinery. Prepared for the U.S. Environmental Protection Agency. Research Triangle Park, NC. Publication No. EPA–600/4–82–054. August 1982. 100 p.

[48 FR 13327, Mar. 30, 1983 and 48 FR 23611, May 25, 1983, as amended at 48 FR 32986, July 20, 1983; 51 FR 31701, Aug. 5, 1985; 52 FR 17556, May 11, 1987; 52 FR 30675, Aug. 18, 1987; 52 FR 34650, Sept. 14, 1987; 53 FR 7515, Mar. 9, 1988; 53 FR 41335, Oct. 21, 1988; 55 FR 18876, May 7, 1990; 55 FR 40178, Oct. 2, 1990; 55 FR 47474, Nov. 14, 1990; 56 FR 5526, Feb. 11, 1991]

APPENDIX C TO PART 60—DETERMINATION OF EMISSION RATE CHANGE

1. Introduction.

1.1 The following method shall be used to determine whether a physical or operational change to an existing facility resulted in an increase in the emission rate to the atmosphere. The method used is the Student's *t*

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Wheeling News-Register and
Intelligencer
Legal Ad Department
1500 Main Street
Wheeling, WV 26003

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor
John M. Ranson
Cabinet Secretary

David C. Callaghan
Director
Ann A. Spaner
Deputy Director

July 7, 1994

Mr. Tim Carroll
Office of Air Quality
Northern Panhandle Regional Office
1911 Warwood Avenue
Wheeling, West Virginia 26003

Dear Mr. Carroll:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Office of Air Quality, Northern Panhandle Regional Office, 1911 Warwood Avenue, Wheeling, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Parkersburg News
Legal Ad Department
519 Juliana Street
Parkersburg, WV 26102

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Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
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Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Dorothy Chittum
Librarian
Parkersburg/Wood County Public Library
3100 Emerson Avenue
Parkersburg, West Virginia 26104

Dear Ms. Chittum:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

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45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Parkersburg/Wood County Public Library, 3100 Emerson Avenue, Parkersburg, West Virginia on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Herald-Dispatch
Legal Ad Department
P. O. Box 2017
Huntington, WV 25720

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Mr. Matt Onion
Cabell County Public Library
455 9th Street Plaza
Huntington, West Virginia 25701

Dear Mr. Onion:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Cabell County Public Library, 455 9th Street Plaza, Huntington, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

Charleston Daily Mail
Legal Ad Department
1001 Virginia Street, East
Charleston, WV 25301

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Jeanne Chandler
Librarian
Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

Dear Ms. Chandler:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

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45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Library of the Office of Air Quality located at the address below on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

Beckley Register/Herald
Legal Ad Department
P. O. Drawer P
Beckley, WV 25801

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Susan Vidovich
Librarian
Raleigh County Public Library
P. O. Box 1876
Beckley, West Virginia 25802

Dear Ms. Vidovich:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

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45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Raleigh County Public Library, P. O. Box 1876, Beckley, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Clarksburg Exponent
Legal Ad Department
P. O. Box 2000
Clarksburg, WV 26301

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor
John M. Ranson
Cabinet Secretary

David C. Callaghan
Director
Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Donna Riggs
Secretary
WV Air Pollution Control Commission
North Central Regional Office
109 Adams Street, Room M-2
Fairmont, West Virginia 26554-2800

Dear Ms. Riggs:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
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45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Office of Air Quality, North Central Regional Office, 517 1/2 East Park Avenue, Fairmont, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

Mineral Daily News Tribune
Legal Ad Department
P. O. Box 879
Keyser, West Virginia 26726

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor
John M. Ranson
Cabinet Secretary

David C. Callaghan
Director
Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Karen Hiser
Librarian
Keyser-Mineral County Public Library
105 North Main Street
Keyser, West Virginia 26726

Dear Ms. Hiser:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

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45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

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The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Keyser-Mineral County Public Library, 105 North Main Street, Keyser, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Record Delta
Legal Ad Department
P. O. Box 550
Buckhannon, WV 26201

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor
John M. Ranson
Cabinet Secretary

David C. Callaghan
Director
Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Ruth B. Six
Librarian
Gassaway Public Library
100 Birch Street
Gassaway, West Virginia 26624

Dear Ms. Six:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

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45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Gassaway Public Library, 100 Birch Street, Gassaway, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

Elkins Inter-Mountain
Legal Ad Department
P. O. Box 1339
Elkins, WV 26241

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Elkins-Randolph County Public Library
c/o Librarian
416 Davis Avenue
Elkins, West Virginia 26241

Dear Librarian:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Elkins-Randolph County Public Library, 416 Davis Avenue, Elkins, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

David C. Callaghan
Director

Eli McCoy
Deputy Director

July 1, 1994

The Evening/Weekend Journal
Legal Ad Department
207 West King Street
Martinsburg, WV 25401

Dear Legal Ad Department:

Please publish the enclosed "Notice of Public Hearing" as soon as possible as a Class I legal advertisement. The publication must occur no later than Friday, July 8, 1994 and must not be published on Sunday as a matter of law. If you have any questions regarding this matter, please contact Tammy Mowrer at 558-2275.

You may submit your invoice and a tear sheet to the attention of Ms. Nadine Sitton, 1558 Washington Street, East, Charleston, West Virginia 25311.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Ms. Peggy Y. Batten
Librarian
Martinsburg-Berkeley County Public Library
101 West King Street
Martinsburg, West Virginia 25401

Dear Ms. Batten:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

DEPARTMENT OF COMMERCE, LABOR & ENVIRONMENTAL RESOURCES
DIVISION OF ENVIRONMENTAL PROTECTION
1558 Washington Street, East
Charleston, WV 25311-2599

Gaston Caperton
Governor

John M. Ranson
Cabinet Secretary

David C. Callaghan
Director

Ann A. Spaner
Deputy Director

July 7, 1994

Mr. Richard Poling
Office of Air Quality
Eastern Panhandle Regional Office
P. O. Box 99
Burlington, West Virginia 26710

Dear Mr. Poling:

On Tuesday, August 9, 1994 the West Virginia Air Pollution Control Commission will hold a public hearing on the following proposed legislative rules: 45CSR5, 45CSR6, 45CSR25, 45CSR36, 45CSR37, and 45CSR38. Please retain the enclosed documents for public review until after the August 9th hearing. Also, please have any interested party sign the enclosed register and return the register and any correspondence you may have regarding the proposed legislative rules.

Thank you very much for your cooperation and assistance in this matter. If you have any questions, please direct them to Tammy Mowrer at (304) 558-2275.

Sincerely yours,

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosures

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5	-	To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6	-	To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25	-	To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36	-	Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
45CSR37	-	Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)
45CSR38	-	Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U. S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following locations: Martinsburg-Berkeley County Public Library, 101 King Street, Martinsburg, WV and the Office of Air Quality's Burlington Office, P. O. Box 99, Burlington, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

I, as an officer of the News-Tribune, a daily newspaper published at Keyser, Mineral County, West Virginia, hereby certify that the Division of Environmental Protection in the case of Notice of Public Hearing: New Legislative Rules

vs.

a copy whereof is hereto annexed has been published for 1 consecutive day in said NEWS-TRIBUNE, the first publication being on the 7th day of, July 19 94.

Given under my hand at Keyser this 7th day of July, 19 94.

Publisher

Publisher's Fee

$31.50

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginnning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments).

45CRS6 - To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments).

45CRS25 - To Prevent and Control Air Pollution from Harzardous Waste Treatment, Storage, or Disposal Facilities (Amendments).

45CRS36 - Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule).

45CRS37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule).

45CRS38 - Provisions for Detemination of Compliance with Air Quality Management Rules (New Rule).

Upon authorization and promulgation, the above rules, with the exception of 45CRS25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CRS25 will be submitted to U.S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U.S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Keyser-Mineral County Public Library, 105 North Main Street, Keyser, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office: G. Dale Farley, Office of Air Quality, Division of Environmental Protection, 1558 Washington Street, East, Charleston, WV 25311-2599.

7: 7

State of West Virginia, County of Randolph, ss.

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5—To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

45CSR6—To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25—To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

45CSR36—Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)

45CSR37—Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide In Hancock County (New Rule)

45CSR38—Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U.S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U.S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Elkins-Randolph County Public Library, 416 Davis Avenue, Elkins, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

7-7

I, James Hoffman, Publisher of THE INTER-MOUNTAIN, a newspaper published at Elkins, in said county, do hereby certify that the annexed advertisement was published on the following dates:

July 07

19 94 as required by law.

Given under my hand this 07 day of July 19 94

James Hoffman
Publisher

Printer's Fee: $ 41.69

Sworn before me this 07 day of July, 19 94.

Shirley A Menear
Notary Public

My commission expires on the 15 day of April ~~19~~ 2002

NOTICE OF PUBLIC HEARING

On Tuesday, August 2, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

45CSR6 - To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25 - To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

45CSR36 - Requirements for Determining conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under title 23 U.S.C. or the Federal Transit Act, to Applicable Air Quality Implementation Plans (New Rule)

45CSR37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)

45CSR38 - Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the Federal Clean Air Act, as amended. 45CSR25 Will be submitted to U.S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U.S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Office of Air Quality, Northern Panhandle Regional Office, 1911 Warwood Avenue, Wheeling, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality

STATE OF WEST VIRGINIA,
COUNTY OF OHIO.

I, Bonnie Mattern *for the publisher of the*

WHEELING NEWS-REGISTER
~~WHEELING INTELLIGENCER~~ *newspapers published in the CITY OF*

WHEELING, STATE OF WEST VIRGINIA, hereby certify that the annexed publication was inserted in said newspaper on the following dates:

July 8, 1994

commencing on the 8 *day of* July, *19* 94

Given under my hand this 13 *day of* July, *19* 94

Bonnie Mattern

Sworn to and subscribed before me this 15th *day of* July *19* 94 *at WHEELING, OHIO COUNTY, WEST VIRGINIA*

Marjorie A. Strauss
Notary Public

of, in and for OHIO COUNTY, WEST VIRGINIA.

My Commission expires Sept. 26, 2000

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
MARJORIE A. STRAUSS
1500 Main Street
Wheeling, West Virginia 26003
My Commission Expires Sept. 26, 2000

NOTICE

On Tuesday, August 9, 994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5
To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

45CSR6
To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25
To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

45CSR36
Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)

45CSR37
Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)

45CSR38
Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U. S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street, East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Cabell County Public Library, 455 9th Street Plaza, Huntington, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of
Environmental Protection
1558 Washington
Street, East
Charleston, WV 25311-2599
LH-931 7-7,94

AFFIDAVIT OF PUBLICATION

T VIRGINIA,
COUNTY OF CABELL, TO-WIT:

I, Connie Rappold being first duly sworn, depose and say that I am Legal Clerk for The Herald-Dispatch, a corporation, who publishes at Huntington, Cabell County, West Virginia, the newspaper: The Herald-Dispatch, a independent newspaper, in the morning seven days each week, Monday through Sunday including New Year's Day, Memorial Day, the Fourth of July, Labor Day, Thanksgiving and Christmas; that I have been duly authorized by the Board of Directors of such corporation to execute this affidavit of publication for an on behalf of such corporation and the newspaper mentioned herein; that the legal advertisement attached in the left margin of this affidavit and made a part hereof and bearing number LH-931 was duly published in

The Herald-Dispatch

one time, ~~once a week for successive weeks~~ commencing with its issue of the 7th day of July, 19 94, and ending with the issue of the 7th day of July, 19 94, and was posted at the East door of the Cabell County Courthouse on the 7th day of July, 19 94: that said legal advertisement was published on the following dates: July 7, 1994

; that the cost of publishing said annexed advertisement as aforesaid was ; that such newspaper in which such legal advertisement was published has been and is now published regularly, at least as frequently as once a week for at least fifty weeks during the calendar year as prescribed by its mailing permit, and has been so published in the municipality of Huntington, Cabell County, West Virginia, for at least one year immediately preceding the date on which the legal advertisement set forth herein was delivered to such newspaper for publication; that such newspaper is a newspaper of "general circulation" as defined in Article 3, Chapter 59, of the West Virginia Code, within the publication area or areas of the municipality of Huntington, Cabell and Wayne Counties, West Virginia, and

that such newspaper is circulated to the general public at a definite price or consideration; that such newspaper on each date published consists of not less than four pages without a cover; and that it is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature, and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices.

Connie Rappold

Taken, subscribed and sworn to before me in my said county this 7th day of June, 19 94

My commission expires October 24, 2000

Melissa L Sullivan

Notary Public
Cabell County,
West Virginia

10M Form A-135 (867H)

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

45CSR6 - To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25 - To Prevent Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

45CSR36 - Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)

45CSR37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)

45CSR38 - Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U.S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U. S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be held in the Office of Air Quality's Conference Room at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written comments by all interested parties will be accepted from the date of this notice until the close of the hearing and made part of the record. Oral comments will be accepted at the public hearing and will be limited to five minutes per person per rule. The period for public comment will end at the close of the hearing.

Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Parkersburg/Wood County Public Library, 3100 Emerson Avenue, Parkersburg, West Virginia on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

Jul. 8

HEATHER BYERS being first duly sworn, says that the

NOTICE OF PUBLIC HEARING

hereto attached was printed in the Parkersburg News a DAILY newspaper published in the City of Parkersburg, Wood County, West Virginia, and posted at the front door of the Court House for ONE successive weeks, the first publication and posting thereon being on the 8th day of July 19 94, and subsequent publication on the day of 19, the day of 19, the day of 19, the day of 19, and the day of 19.

Printer's Fee $ 40.24

6 2/8 " x 103= 643.75 words @ .0625

Heather J Byers

Subscribed and sworn to before me this 8th day of July 19 94.

Melanie Ayla
Notary Public for Wood County, West Virginia

My commission expires 3-23-04

Parkersburg Printing Co. - 5/71

AFFIDAVIT OF PUBLICATION

BECKLEY NEWSPAPERS INC.

BECKLEY, WEST VIRGINIA 25801

July 8, , 1994

STATE OF WEST VIRGINIA
COUNTY OF RALEIGH, to wit:

I, Robert E. Zutaut being first duly sworn upon my oath, do depose and say that I am Advertising Manager of Beckley Newspapers Inc., a corporation, publisher of the newspaper entitled The Register-Herald, an Independent newspaper; that I have been duly authorized by the board of directors of such corporation to execute this affidavit of publication; that such newspaper has been published for more than one year prior to publication of the annexed notice described below; that such newspaper is regularly published daily, for at least fifty weeks during the calendar year, in the municipality of Beckley, Raleigh County, West Virginia; that such newspaper is a newspaper of "general circulation," as that term is defined in article three, chapter fifty-nine of the Code of West Virginia, 1931, as amended, within the publication area or areas of the aforesaid municipality and county; that such newspaper averages in length four or more pages, exclusive of any cover, per issue; that such newspaper is circulated to the general public at a definite price of consideration; that such newspaper is a newspaper to which the general public resorts for passing events of a political, religious, commercial and social nature, and for current happenings, announcements, miscellaneous reading matters, advertisements and other notices; that the annexed notice

of Public Hearing
(Description of notice)

was duly published in said newspaper once a week for one successive week (Class I), commencing with the issue of the 8th day of July, 1994, and ending with the issue of the 8th day of July, 1994, (and was posted at the

on the day of); that said annexed notice was published on the following dates:

July 8, 1994 and that the cost of publishing said annexed notice as aforesaid was $ 44.30.

Signed R. E. Zutaut
Robert E. Zutaut, Advertising Manager
Beckley Newspapers

Taken, subscribed and sworn to before me in my said county this

8th day of July, 1994

My commission expires March 27, 2001

Notary Public of Raleigh County, West Virginia

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
DIANA L. SLONE
BECKLEY NEWSPAPER
P. O. DRAWER P OR R
BECKLEY, WV 25801
My Commission Expires March 27, 2001

COPY OF PUBLICATION

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

45CSR6 - To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25 - To Prevent And Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

45CSR36 - Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)

45CSR37 - Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County (New Rule)

45CSR38 - Provisions for Determination of Compliance with Air Quality Management Rules (New Rule)

Upon Authorization and promulgation, the above rules, with the exception of 45CSR25, will be submitted to the U.S. Environmental Protection Agency for EPA approval and incorporation into the West Virginia State Implementation Plan under the federal Clean Air Act, as amended. 45CSR25 will be submitted to U.S. EPA as a component part of the State's rules for program authorization relative to the hazardous waste management provisions under the federal Resource Conservation and Recovery Act.

After conclusion of the hearing on the proposed rules above, the Division of Environmental Protection will hold a hearing on proposed minor revisions to the maintenance plans associated with West Virginia's three redesignation requests currently pending before U.S. EPA for the Charleston, Parkersburg, and Huntington/Ashland ozone nonattainment areas. These revisions contain language which clarifies West Virginia's commitments for contingency measures that had been incorporated in the original November 13, 1992 Redesignation Request, the Update to the November 13, 1992 Redesignation Request, dated February 28, 1994 for the Charleston/Parkersburg areas and the Amendment to the November 12, 1992 Redesignation Request, dated November 12, 1993 for the Huntington/Ashland area.

The public hearing will be in the Office of Air Qu Conference Room at Washington Street Charleston, West Virginia. hearing is open to the p Written comments by interested parties will accepted from the date of notice until the close of hearing and made part of the ord. Oral comments will accepted at the public he and will be limited to five nutes per person per rule. period for public comment end at the close of the hearin

Copies of the prop legislative rules may be obta from the Office of Secretar State or may be reviewed d normal business hours at following location: Ra County Public Library, P.O. 1876, Beckley, WV on and July 8, 1994.

Please provide any wr comments or questions to following contact and office: G. Dale Farley, Office of Quality, Division Environmental Protection, Washington Street, Charleston, WV 25311-2599.

7-8-Fri-1-RH

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Environmental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)

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Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Office of Air Quality, North Central Regional Office, 517 1/2 East Park Avenue, Fairmont, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

PUBLISHER'S CERTIFICATE

OFFICE OF AIR QUALITY
AUG 11 P 12:45

STATE OF WEST VIRGINIA,

COUNTY OF HARRISON

I, Deborah S. Veltri

Classified Office Manager of THE CLARKSBURG EXPONENT, a newspaper of general circulation published in the City of Clarksburg, County and State aforesaid, do hereby certify that the annexed

Notice of Public Hearing

was published in said THE CLARKSBURG EXPONENT one time, on the

7 day of July 19 94.

The publisher's fee for said publication is $ 25.25

Deborah S Veltri
Classified Office Mgr. of The Clarksburg Exponent

SEAL

Subscribed and sworn to before me this 7 day of July, 19 94

Debra Kay Swiger
Notary Public in and for Harrison County, WV.

My commission expires on the 25th day of August, 2003

Form CA-14 E

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
Debra Kay Swiger
Route 1, Box 26A
Wallace, WV 26448
My Commission Expires August 25, 2003

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia division of Environmental Protection will hold public hearings on the following proposed new legislative rules and rule amendments:

45CSR5 - To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handling Operations (Amendments)
45CSR6 - To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)
45CSR25 - To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)
45CSR36 - Requirements for Determining Conformity of Transportation Plans, Programs, and Projects Developed, Funded or Approved Under Title 23 U.S.C. or the Federal Transit Act, To Applicable Air Quality Implementation Plans (New Rule)
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Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following location: Gassaway Public Library, 100 Birch Street, Gassaway, WV on or after July 8, 1994.

Please provide any written comments or questions to the following contact and office:
G. Dale Farley
Office of Air Quality
Division of Environmental Protection
1558 Washington Street, East
Charleston, WV 25311-2599
7-8

State of West Virginia, County of Upshur, ss:

.....Mark Davis.....Advertising Manager
Record Delta, a newspaper published at Buckhannon in the said county, do hereby certify that the annexed .....NOTICE OF PUBLIC HEARING.....
.....
.....
was published once a week for ....ONE (1).... successive weeks in said Record Delta newspaper published as aforesaid, commencing on the .8th day....
.....of July..... days of 19..94.....

Given under my hand this .8th day of July.... day of 19 94.....
...Advertising Manager

Printers fee $ .34.50.....

WEST VIRGINIA, UPSHUR COUNTY, TO-WIT:

Subscribed and sworn to before me this 8th day of July day of 19 94....
.....Phyllis J. Neuharth.....Notary Public.

My Commission expires May 26, 2003

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
PHYLLIS J. NEUHARTH
RT. 2, BOX 93
FRENCH CREEK, WV 26218
My Commission Expires May 26, 2003

NOTICE OF PUBLIC HEARING

On Tuesday, August 9, 1994, beginning at 9:00 a.m., the West Virginia Division of Enviromental Protection will hold public hearings on the following proposed new legislative rules or rule amendments:

45CSR5- To Prevent and Control Air Pollution from the Operation of Coal Preparation Plants and Coal Handeling Operations (Amendments)

45CSR8- To Prevent and Control Air Pollution from the Combustion of Refuse (Amendments)

45CSR25- To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities (Amendments)

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Copies of the proposed legislative rules may be obtained from the Office of Secretary of State or may be reviewed during normal business hours at the following locations: Martinsburg-Berkeley County Public Library, 101 King Street, Martinsburg, WV and the Office of Air Quality's Burlington Office, P.O. Box 99, Burlington, WV on and after July 8, 1994.

Please provide any written comments or questions to the following contact and office:

G. Dale Farley
Office of Air Quality
Division of Enviromental Protection
1558 Washington Street, East
Charleston, WV 25311-2599

7:8(1t)

Certificate of Publication

This is to certify the annexed advertisement

WV DEPT.COMM.,LABOR, ENV. RES.
DIV. ENV. PROTECTION
OFFICE OF AIR QUALITY.....

NOTICE OF PUBLIC HEARING.....

appeared for ..... 1 ..... consecutive days weeks in The Journal Publishing Company a newspaper published in the City of Martinsburg, W. Va., in its issue beginning

7/8

and ending

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHERYL D. GEORGE
Box 505½ Jefferson Street
Martinsburg, W.Va. 25401
My Commission Expires September 14, 1998

The Journal

Fee $ 43.61

OAQ MAILING LIST FOR PUBLIC HEARINGS/MEETINGS

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Allegheny Power Service Corp.
800 Cabin Hill Drive
Greensburg, Pennsylvania 15601

Mr. Brian Broderick
BNA PLUS
Bureau of National Affairs
1231 25th Street, N.W.
Washington, D.C. 20037

Mr. Greg Scandrett
ERM Midwest
5088 West Washington Street
Charleston, WV 25313

Ms. Becky Fleming
Charleston Daily Mail
1001 Virginia Street, East
Charleston, WV 25301

Mr. Norm Steenstra
Environmental Coordinator
West Virginia Citizen Action Group
1324 Virginia Street, East
Charleston, West Virginia 25301

Mr. Eric Niiler
Charleston Gazette
1002 Virginia Street, East
Charleston, WV 25301

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Scott Depot, WV 25560

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P. O. Box 367
Institute, WV 25112

Ms. Lillian Erskin
52 Bailes Drive
Nitro, WV 25143

Ms. Suzanne Tenkhoff
National Institute for Chemical Studies
Nitro/St. Albans Committee
31 Bailes Drive
Nitro, West Virginia 25143

Mr. Ray de Bolt
Fire Chief
Charleston Fire Department
808 Virginia Street, West
Charleston, WV 25302

The Honorable William Croye
Mayor, City of Belle
National Institute for Chemical Studies
Upper Kanawha Valley Committee
110 East DuPont Avenue
Belle, West Virginia 25015

Dr. Paul Hill, President
National Institute for Chemical Studies
University of Charleston
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Charleston, West Virginia 25304

Mr. Tim Carroll
Regional Office Supervisor
Northern Panhandle Regional Office
WV Office of Air Quality
1911 Warwood Avenue
Wheeling, West Virginia 26003

Mr. William Taylor
Regional Engineer
North Central Regional Office
WV Office of Air Quality
109 Adams Street, Room M-2
Fairmont, WV 26554-2800

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Jackson & Kelly
1600 Laidley Tower
Charleston, WV 25301

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Vice-President, Energy & Environment
Ryan-McGinn
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Arlington, VA 22201

Larry G. Kopelman
Special Assistant Attorney General
WV Air Pollution Control Commission
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Charleston, WV 25302

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Ohio Valley Environmental Coalition
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Ms. Pamela Nixon
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Mr. Oliver A. Fick
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Ms. Liz McMeekin
Aristech Chemical Company
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Pittsburgh, PA 15219

Ms. Liz Schiffer
128 Woodbridge Drive
Charleston, WV 25311

Ms. Britt Bernheim
Office of Air Quality
1615 Washington Street, East
Charleston, WV 25311

W VA OFFICE OF AIR QUALITY

AUGUST 9, 1994

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DONELL, D.R.	STARVAGGI IND. INC	401 PENNA. AVE. WEIRTON, WV 26062
MULLINS, STEPHEN E.	HERCULES / ALLEGANY BALLISTICS LAB	P.O. BOX 210 ROCKET CENTER, WV 26726
HULBURT DAVID A	Hercules/ Allegany Ballistics Lab	PO Box 210 Rocket Center WV 26726
Christopher B. Power	Robinson & McElwee	Charleston
Doug Rice	WVDOT	"
Mary Ryhill	Quaker State	Oil City PA
Ron Ryan	Quaker State	Newell, WV
Steve Tripp	Quaker State	Newell, W.Va.
Frank Pozzi	WV DOT	Chas WV
Richard L Warren	WVDOT	Chas. WV
David C Bailey	WVDOT	Chas, WV
John Wiseman	WVDOT	Chas. WV.

W VA OFFICE OF AIR QUALITY

AUGUST 9, 1994

NAME	COMPANY AFFILIATION	ADDRESS
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Mike McThomas	Robinson + McElwee WVMA	Box 1791 Chas WV
Pat Pearlman	Jackson & Kelly	Charleston
Mary R White	Quaker State	Oil City PA
[illegible]	WVMA	1558 Washington, E.
John Benedict	WVDEP	"
Gene Tripp	Quaker State	Newell, WestVa.
[illegible]	Weirton Steel	Weirton WVa
[illegible]	WVDEP OAQ	Charleston
Kara Watson	"	"
Jeanne Chandler	WVDEP- PIO	Charleston

PUBLIC HEARING

WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION

OFFICE OF AIR QUALITY

* *

The following is a transcript of a public hearing held at the West Virginia Division of Environmental Protection, Office of Air Quality, 1558 Washington Street, Charleston, Kanawha County, West Virginia, on August 9, 1994, at 9:00 a.m., and taken by Christy L. Morris, Certified Court Reporter and Notary Public, pursuant to notice.

* *

S U P E R I O R C O U R T R E P O R T I N G
Christy L. Morris, CCR
3719 Virginia Avenue, S.E.
Charleston, West Virginia 25304
(304) 925-2244 Mobile 542-4606

ORIGINAL

PROCEEDINGS

45CSR37

PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY

MS. CHANDLER: The purpose of this public hearing is to hear discussions on proposed Rule 45CSR37.

Provisions To Control Sulfur Dioxide Emissions And Ambient Air Quality Levels Of Sulfur Dioxide In Hancock County.

This rule establishes emission standards, compliance determination methods and other requirements for the control of sulfur dioxide emissions and ambient concentrations of sulfur dioxide associated with sources of such emissions in Hancock County. The intent of this rule is to achieve attainment of the national and state ambient air quality standards for sulfur dioxide in the Hancock County area and to subsequently maintain such attainment.

Upon authorization and promulgation,

45CSR37 will be submitted to the U.S. Environmental Protection Agency for the EPA approval and incorporation into the West Virginia State Implementation Plan under the Federal Clean Air Act, as amended.

The floor is now open for public comment.

MR. FARLEY: Somewhat in line with a summary there, the tentative proposed rule 45CSR37 is to address measured and modeled violations of the national ambient air quality standards for sulfur dioxide in Hancock County. Measured violations of the annual sulfur dioxide (NAQS), I will use that term N-A-Q-S, have occurred since the early 1980s.

In line with some studies and more intensive monitoring that has been done in the area of Weirton in the last two years, we have found continuing and troublesome violations of not only the annual standard but of the 24 hour and 3 hours standard as well. These problems have been discussed extensive in one case, less extensively with another company but the problems have been discussed for some time. The two

major -- I would have to say two -- there aren't too many facilities that are actually in Hancock County and that is mainly Weirton Steel Corporation and Quaker State Corporation.

I would like to note that in regard to these aforementioned discussions we have had numerous interchange of information with both companies. There have been discussions in regard to the development of consent orders which should be put in place and submitted to the EPA as -- with request to incorporate those orders into the State Implementation Plan in lieu of, or in addition to, if you would prefer either way, to the rule as proposed or the rule amended in some fashion. I should state that that maybe a course of action that is followed by the OAQDT.

There is a couple of errors that were made in the rule, in the drafting of the rule, that I would like to point out. One of which might bring about additional comments of substance. There are some minor errors in typos that need corrected but the two that have been brought to my attention is 1) Throughout the rule since we have two companies

primarily affected, we refer to the Quaker State Refining Corporation and that is currently an error. I think that should be properly referred to as the Quaker State Corporation, or its successors or its assigns, that is a terminology also we will modify slightly. Another very significant typo that occurred at section 4.2(a) where we referred to emission standard of 50 grains of hydrogen sulfide for dry standard cubic foot in the third and fourth lines. That should have read and that an omission of a number -- that should have read as 50 grains of hydrogen sulfide per hundred dry standard cubic foot of gas, which is in accordance with existing Regulation 10.

MS. CHANDLER: Thank you, Mr. Farley.

MR. CURRENT: Good morning. My name is Gene Current and I am Director of Environmental Control for Weirton Steel Corporation. I appreciate the opportunity to present comments on Reg. 37 at this public hearing today. In addition to these verbal comments, Weirton Steel is also submitting more comprehensive written comments.

As a matter of background, Weirton Steel

is an employee-owned company which operates an integrated steel mill facility in Weirton, West Virginia. Weirton Steel is also West Virginia's largest industrial employer and taxpayer, employing approximately 6,000 people. In addition to its employees, Weirton Steel indirectly supports virtually every business and service in Weirton and the surrounding area.

Weirton Steel is committed to a healthy environment. During the past ten years, we have committed a 103 million dollars to environmental control facilities. This represents about 13.3% of the total capital expended over the 10-year period. This percentage far exceeds the steel industry average of 7.5%.

Weirton Steel is here today because we are very concerned about the Office of Air Quality's Regulation 37, which stipulates provisions to control sulfur dioxide emissions in Hancock County.

Proposed Regulation 37 is grossly unfair to Weirton Steel for the following reasons: It mandates overly stringent SO2 limitations in

combination with requirements for the installation of Good Engineering Practice stacks, also known as GEP stacks, at the Company's high pressure boilers. Now, these requirements we consider to be overkill in that either one of these two stipulations may singly address the Weirton SO2 exceedance problem.

Utilizing the GEP stack strategy, or the tall stacks, as the law people like to refer to them, utilities in Ohio/Pennsylvania/West Virginia tri-state area are discharging SO2 at a rate that is over 100 time that of Weirton Steel. Based on installation of GEP stacks alone, local power plants across the river from Weirton, in Ohio, are permitted emission rates which are as high as six times the proposed Regulation 37 limitation for coal burning units and twelve times the proposed limitation for oil burning units. Should such a disparity exist between facilities in such close proximity? The answer to that is definitely, no.

In a nonattainment area, it is inappropriate and unfair to impose differing SO2 limitations for coal and oil as proposed in Regulation 37. Ambient air quality is governed by a mass per unit

time relationship (such as pounds per hour) rather than a mass per unit energy relationship (such as pounds per BTU of heat input). A pounds per hour standard is also more appropriate in that it is easier to monitor, particularly in multi-fuel sources and it is consistent with modeling protocol. Consequently, a pounds per hour standard should be applied to Weirton Steel sources.

Regulation 37 stipulates extensive continuous emission monitoring requirements. It is the position of Weirton Steel that predictive emission monitoring methods can be applied at point sources which are far less expensive and just as reliable as the continuous emission monitoring.

There is insufficient technical justification for those requirements in the proposed regulation that relate to the Weirton Steel or I should say the Weirton nonattainment area. At this time, a dispersion modeling attainment demonstration has been achieved for the New Manchester-Grant area. However, due to technical problems associated with modeling in complex or rough terrain areas, such an attainment

demonstration has not been achieved in Weirton, West Virginia. Additional technical evaluation and studies are, therefore, required to achieve a resolution to the Weirton problem.

Proposed Regulation 37 would have a tremendous financial impact on Weirton Steel and its coal supplier, Starvaggi Industries. Local coal mining and industrial jobs are being placed at risk with no demonstrated correlation to SO2 attainment in the Weirton area.

Unfortunately, proposed Regulation 37 has been placed in a fast track mode to address nonattainment issues in the Grant Magisterial District without affording Weirton Steel the opportunity to complete its testing programs which are directed toward the resolution of the local nonattainment problem in Weirton. In order to achieve a well-engineered cost effective solution to the Weirton problem, the New Manchester-Grant and the Weirton nonattainment issues should be addressed separately. Addressing these two as separate entities is consistent with the submittal time frames and attainment dates that are applicable in

those areas. The New Manchester-Grant area for example, must achieve attainment by February 5th of next year; whereas, Weirton, West Virginia does not have to achieve attainment until January 20, 1999.

It should be noted that the majority of the SO2 ambient area impact in the New Manchester-Grant nonattainment area comes from utility sources, primarily the Sammis Power Plant which is in Ohio. In this regard, the WVDEP should be contacting Ohio EPA concerning the level of SO2 emissions at Sammis and the ambient impact from this large Ohio power plant in the New Manchester-Grant area.

Despite having only 30-50% of the modeled SO2 impact of the Sammis plant in Manchester area, Weirton Steel is still prepared to make a substantial commitments. Weirton Steel stands ready to negotiate an interim consent order containing SO2 limitations which are consistent with the modeled attainment demonstration for the New Manchester-Grant nonattainment area. Such an interim draft order has been developed and it is presently under review by the Office of Air Quality. The reduction is actually

applied in this consent order or about 70% below the allowable level.

As indicated previously, Weirton Steel is committing studies and completing those studies and technical evaluations to address the local nonattainment area in Weirton. Weirton believes that additional tasks in the form of emission testing, ambient area impact and operational studies, design engineering area are also needed to be completed before a revised SIP can be developed that will demonstrate attainment in Weirton, West Virginia.

Weirton Steel will commit to work with the Office of Air Quality to develop a second consent order to address the SO2 attainment issues in Weirton once these necessary tasks are completed.

Given the difficulty of modeling local impacts in Weirton, Weirton Steel also is willing to work toward an attainment demonstration based on an emissions rollback approach or a commitment to increase stack heights in accordance with good engineering practice requirements.

In conclusion, then I would say that it

is appropriate for the West Virginia DEP to withdraw proposed Regulation 37 and enter into consent orders with Weirton Steel as well as Quaker State to address the New Manchester-Grant SO2 nonattainment area.

Following the completion of the additional work that I have cited to be performed by Weirton Steel, a second consent order should be developed to support an attainment demonstration for the Weirton, West Virginia area. Thank you very much.

MS. WHITE: Good morning. This is everyone's lucky day, Quaker State's outside counsel is on vacation and the Red House counsel has laryngitis. My name is Mary Rensford White. My comments will be brief for obvious reasons. I am Vice-President and Environmental Counsel for Quaker State Corporation located in Oil City, Pennsylvania.

With me today are Mr. Tripp, Quaker State's plant manager of our West Virginia refinery and Mr. Ron Ryan, who is the engineer who is most familiar with the modeling that has been performed at that plant. We are here today to comment on Regulation 37 and to echo much of the comments just presented by

Weirton Steel.

We are strongly proposing and urging the withdraw of Regulation 37 in favor of more specific tailored, sensible consent orders with the two facilities that more accurately reflect the needs of those facilities while at the same time demonstrating attainment in the New Manchester-Grant Magisterial District.

We also believe that the modeling that we have done to date using, in our case, the complex terrain model recommended by the EPA with certain modifications also recommended by the EPA clearly demonstrates that Quaker State can achieve modeled attainment for that district without the necessity of raising the stack heights or without the necessity of imposing unneeded fuel restrictions on that plant and on its operations.

The regulations that will best meet the needs of the people in West Virginia are those that demonstrate an air attainment while at the same time preserving the economic viability and competitive positions of the plants operating in the State.

Our outside counsel, Babst, Calland, Clements and Zomnir, submitted written comments which are much more specific. The letter was directed to the Office of Air Quality, dated August 8, 1994, and I would like to attempt to confirm that those comments have been received and will be part of this record. Those go into a much more detail on the type of SO2 emission commitments that Quaker State is prepared to make in addition to our modeling results and further demonstrations. We do hope that the consent order will be the preferred method of resolution to these problems.

The other point that I would like to echo because I am obviously responsible for compliance with Quaker State and that is that is it inappropriate to measure as to emissions in the pounds per BTU categories. We have wonderful workers but they are not mathematicians and plants that use a mix of fuels have a very difficult time demonstrating and guaranteeing attainment, one that is a calculated limit as opposed to a measured or a more easily demonstrable qualification.

We would, therefore, urge that since the modeling is done in pounds per hour demonstration that that is the appropriate emission regulation to impose upon the plants. We would just urge, again, that the State take into consideration a more individualized approach to this as demonstrated in the consent order as opposed to regulation. Thank you.

MS. CHANDLER: Thank you for your comment.

MR. DONELL: Good morning and thank you. My name is Donald R. Donell and I am the President of Starvaggi Industries in Weirton, West Virginia. We have been in existence for a little over 75 years and at one time we had employed approximately 750 people. At the present time, we employee 300. We provide Weirton Steel with the steam coal and have provided in the past Quaker State with some stoker for their fluidized bed.

If Regulation 37 is implemented as proposed and in its present form, I think I can assure you that the economic impact in our area, as far as Starvaggi and those who directly depend upon Starvaggi, will be catastrophic as opposed to insubstantial. It

will result in the closure of our coal mines I can guarantee it in the Weirton area.

Within twelve miles of Weirton, there are two huge power plants. Both of which spew or emit in excess -- of allowable emission rate -- in excess, I think it is 7.2 with Cardinal and it is either 6 or slightly under 6 at Sammis. And yet the proposed regulation will require Weirton Steel to do a 1.2.

This is a little deja vu as far as my appearance here. In the last 1970s and 80s, I guess I could say it was my privilege to appear before the United States Congress and subcommittees on proposed air regulations and I can remember very vividly being a part of getting the Congress to implement in excess of 500 million dollars and depending on the figures it could be 500, 480 or 600 million dollars to have a ten-year Clean Air Act study for acid rain precipitation. So, the money was appropriated and it involved, if my memory is correct, approximately 2,000 of academia throughout the spectrum and the United States.

A matter of weeks before the Clean Air Act of 1990, there was a summary that was released

indicating that acid rain SO2 was not a serious problem in the United States and particularly in the coal burning areas of the United States. But in its inevitable wisdom Congress rushed through and put in the 1990 Clean Air Act, despite having spent a half a billion dollars plus in saying that this is not true.

My point is this, please don't do the same thing here in West Virginia that the Congress did with the Clean Air Act of 1990. All we are asking -- I can't tell Weirton Steel and I certainly can't tell Quaker State what to do, but I can tell you the impact that it is going to have on our company and that is, please, it will close us once and for all. I would ask you to please take whatever time it is necessary in order to be sure that what has to be done is done.

I ask, again, only that we not make the same mistake that was made in Washington, D.C. I ask the air pollution, the DEP to take into consideration that it is here in the State of West Virginia that the organizations, the industries that are appearing before this body today are, in fact, West Virginia organizations with which they should be very much

concerned.

I ask for the future of my employees as well the future of Weirton Steel and as well as Quaker State. As I understand our situation in Hancock County, the overriding gravamen, an issue in the nonattainment in the Grant area has to do primarily with what evolved over years when the Toronto plant was directly across the road, and it is no longer there, but we do have the Sammis plant directly across the road, and it is there. And that should not be eliminated or ignored as the source of problem that exists in Grant District.

Again, as I indicated, I certainly can't tell any of the industries what to do nor can I tell them how to do it but I can only urge that the State of West Virginia cooperate with those industries directly involved as much as is humanly possible because the vitality of our end of the State depends on these industries.

And just as a point of information, Weirton Steel is down from a little over 12,000 -- 12,550 employees to 6,000. And as I indicated earlier,

we went from 750 down to 300. I think that if there is some sensible resolve the situation can be remedied, your obligation and our obligation is to do whatever we can and as much as we can to actively support these industries and to support the State of West Virginia. All we ask for is fairness, a rational approach and cooperation. We ask for nothing more. Thank you.

MS. CHANDLER: Thank you, Mr. Donell. Any further comments? There being nothing further, the public hearing for 45CSR37 is concluded.

REPORTER'S CERTIFICATE

STATE OF WEST VIRGINIA,

COUNTY OF KANAWHA, to wit:

I, Christy L. Morris, Certified Court Reporter and Notary Public duly certify and commissioned, do hereby certify that the foregoing is a true and accurate transcript of the proceedings had in the public hearing on the 9th day of August, 1994.

Given under my hand and notarial seal this 11th day of August, 1994.

C. L. Morris - CCR
Certified Court Reporter
Notary Public

MY COMMISSION EXPIRES: 12/11/95

COMMENTS OF THE WEST VIRGINIA MANUFACTURERS ASSOCIATION REGARDING PROPOSED 45 CSR 37 "PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY"

August 9, 1994

COMMENTS OF THE WEST VIRGINIA MANUFACTURERS ASSOCIATION REGARDING PROPOSED 45 CSR 37 "PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE IN HANCOCK COUNTY"

I. INTRODUCTION

On July 6, 1994, the West Virginia Division of Environmental Protection ("DEP") filed with the Secretary of State a proposed legislative rule pertaining to sulfur dioxide emissions and ambient air quality levels of sulfur dioxide in Hancock County as authorized under the West Virginia Air Pollution Control Act at Chapter 22, Article 5 of the West Virginia Code ("the Act"). The rule is proposed for inclusion in the Code of State Regulations at Title 45, Series 37 ("the proposed rule").

The West Virginia Manufacturers Association ("WVMA") represents a broad cross-section of large, medium and small industrial concerns in West Virginia. However, two of the WVMA's member-companies in particular will be directly and substantially impacted by the proposed rule if adopted. These two companies, Wierton Steel Corporation ("Weirton Steel") and Quaker State Oil Refining Corporation ("Quaker State") have each filed comments on the proposed rule which address the specific and substantive areas of concern which the rule, as proposed, presents to them. As the WVMA takes an active interest in the regulatory impact of the DEP's rules on its members, the WVMA supports and herein incorporates fully by reference those comments as submitted by Wierton Steel and Quaker State. Notwithstanding this, it is in furtherance of this active and supportive role that the WVMA offers the following additional comments of its own.

II. COMMENTS

1. Fiscal Note -- Proposed Use of Funds Derived From Operating Permit Program.

In the Fiscal Note attached to the proposed rule, the Chief of the Office of Air Quality states that costs incurred to implement this rule will be derived from funds authorized under 45 CSR 30 ("the operating permit program"). However, such proposed financing is directly contrary to Section 4(a)(17)(e) of the Act which provides that fees, penalties and interest collected under the operating permit program "shall be expended solely to cover . . . . costs required to administer the operating permit program" (emphasis added). Accordingly, the WVMA objects to the proposed use of funds collected under the operating permit program to implement the proposed rule. Funding to implement the proposed rule should be derived from the State's general revenue or from other funding sources or established fees. Thus, the WVMA urges that appropriate revision be made to the Fiscal Note.

2. Section 1.5 (page 1); Incorporation By Reference.

The proposed rule incorporates by reference certain counterpart federal regulations on emission monitoring, emission test procedures and criteria, and related recordkeeping and reporting requirements promulgated by the U.S. Environmental Protection Agency. The WVMA recommends that this proposed section be revised so as to ensure that any subsequent revisions to those federal regulations which occur after the effective date of the proposed rule (if finalized) will not lead to confusion regarding applicable requirements. Such revision to this proposed section is also necessary in order to comply with West Virginia's rulemaking procedure which

prohibits the incorporation into State regulations of future changes in federal regulations absent formal amendment or rulemaking. To avoid potential problems, and in an effort to ease the administrative burden on DEP, the WVMA suggests that the following sentence be added to the end of this proposed section:

> Unless otherwise indicated, where reference to a federal regulation or standard appears in this rule, such regulation or standard will, for purposes of this rule, be construed as that version which was in effect as of July 1, 1994.

3. Section 1.7 (page 1); Constitutional Takings Determination.

The WVMA asserts that it is inappropriate to incorporate this section into the proposed rule. A "constitutional takings determination" or assessment is required in limited circumstances -- and the promulgation of this rule does not appear to be one of them. Under W.Va. Code §22-1A-3(a), such an assessment is required if the action being contemplated by DEP is

> reasonably likely to deprive a private real property owner of his or her property in fee simple or to deprive an owner of all productive use of his or her property***.

The mere promulgation of a new rule (or, for that matter, amendment of an existing one) does not automatically meet the above test for when an assessment is required if its effect is merely to limit certain uses pursuant to state or federal statute. The Legislature also did not intend that such determinations be incorporated within the rule, thereby becoming law upon final adoption. Accordingly, the WVMA urges that proposed Section 1.7 be deleted from the final rule and that an appropriate "takings" determination be supplied by the Director in the supporting documents accompanying the final rule upon filing with the Secretary of State.

III. CONCLUSION

On behalf of its member companies, and in support of Wierton Steel and Quaker State, the WVMA appreciates this opportunity to present its concerns and suggestions for changes to this rule.

Respectfully submitted this 9th day of August, 1994.

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WEIRTON
STEEL CORPORATION

Gene R. Current
Director, Environmental Control
304/797-2394

August 8, 1994

WV Division of Environmental Protection
Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

Re: **Weirton Steel Corporation Comments Regarding Proposed Regulation 37, "Provisions for Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"**

Dear Sir/Madam:

Weirton Steel Corporation ("WSC") hereby submits the following comments regarding Proposed Regulation 37, "Provisions for Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County" (the "Proposed Rule"). The Proposed Rule has been developed to address the New Manchester-Grant Magisterial District ("New Manchester-Grant") and the City of Weirton ("Weirton") sulfur dioxide ("SO_2") nonattainment areas so that these SO_2 nonattainment areas will achieve and maintain the National Ambient Air Quality Standards ("NAAQS") for SO_2 within the federal Clean Air Act-mandated timeframes. WSC's comments primarily focus on the scope, technical bases, and significant economic impact of the Proposed Rule.

I. Introduction

WSC owns and operates an integrated steelmaking facility located in Weirton, West Virginia in southern Hancock County. WSC is one of the largest employee-owned companies in the world, and it employs approximately 6,000 people in the Weirton area near the facility. WSC is also West Virginia's largest industrial employer and taxpayer.

Since its formation in 1984, WSC has invested significant capital resources in implementing air emission reduction measures to reduce its emissions pursuant to state and federal environmental regulations. More specifically, WSC has invested significant resources in complying with Regulation 10 "To Prevent and Control Air Pollution from the Emission of Sulfur Oxides" and in attempting to identify and resolve issues associated with attainment and maintenance of the NAAQS for SO_2 in both New Manchester-Grant and in Weirton, West Virginia.

As such, WSC is concerned with the approach taken by the West Virginia Division of Environmental Protection, Office of Air Quality ("DEP" or the "Division") in the Proposed Rule. WSC believed that the Proposed Rule must be modified significantly in order to appropriately address the SO_2 nonattainment problems in Hancock County, West Virginia.

II. History of SO_2 Nonattainment in Hancock County, West Virginia

New Manchester-Grant was originally designated as an SO_2 nonattainment area on March 3, 1978. 43 Fed. Reg. 8982, 9044. Although this area has not had a monitored exceedance of the SO_2 NAAQS since 1984, the area has remained nonattainment for SO_2 apparently because the state was previously unable to demonstrate SO_2 attainment in New Manchester-Grant through disperison modeling.

On February 5, 1990, the United States Environmental Protection Agency ("U.S. EPA") issued a state implementation plan ("SIP") call to the State of West Virginia requiring, inter alia, a revised SIP to address the attainment and maintenance of the SO_2 NAAQS in all of Hancock County, West Virginia. Despite requesting additional time to develop a revised SO_2 SIP, West Virginia did not formally submit a revised SO_2 SIP pursuant to the SIP call.

The Clean Air Act Amendments of 1990 (the "1990 Amendments") were signed into law on November 15, 1990 and retained all existing nonattainment areas by "operation of law", including New Manchester-Grant. Clean Air Act § 107(d)(1)(C), 42 U.S.C. § 7407(d)(1)(C). The 1990 Amendments require that states with areas designated nonattainment for SO_2 by operation of law must submit to U.S. EPA a revised SO_2 state implementation plan ("SIP") by May 15, 1992, and the nonattainment area must achieve attainment by November 15, 1995. Clean Air Act §§ 191(b) and 192(b), 42 U.S.C. §§ 7514(b) and 7514a(b).

On January 30, 1991, U.S. EPA informed West Virginia that pursuant to Clean Air Act § 191(b), a revised SO_2 SIP submission was required for the New Manchester-Grant area no later than May 15, 1992. In response, DEP submitted a committal SIP for this area on August 11, 1993. The committal SIP provided an outline of the steps required for completion of the SO_2 SIP revision, with the final submittal to U.S. EPA occurring on December 1, 1994. It appeared that during this process U.S. EPA believed that the New Manchester-Grant area was subject to the SO_2 SIP revision deadlines in Clean Air Act § 191(b) and the SO_2 attainment deadlines in Clean Air Act § 192(b).

However, by a letter dated June 13, 1994, U.S. EPA informed West Virginia that Clean Air Act §§ 191(b) and 192(b) do not apply to the New Manchester-Grant area. Rather, U.S. EPA believes Clean Air Act § 192(c) (pertaining to inadequate SIPs) applies to this particular situation. Clean Air Act § 192(c) has no deadline for the submission of revised SO_2 SIPs, but it does require attainment of the NAAQS within 5 years of the finding that the particular SIP is inadequate. Therefore, because the February 5, 1990 SIP call

constituted the original SIP inadequacy finding, attainment of the SO_2 NAAQS in New Manchester-Grant must be achieved by February 5, 1995.

U.S. EPA has also indicated that as a result of the confusion caused by its misinterpretation of Clean Air Act § 191(b), it is establishing December 1, 1994 as the revised SO_2 SIP submittal date for the New Manchester-Grant area. The Proposed Rule is being developed to address this requirement.

Weirton, West Virginia, including the Butler and Clay Magisterial Districts, was designated as an SO_2 nonattainment area effective on January 20, 1994. 58 Fed. Reg. 67334 (December 21, 1993). The Division must submit a revised SO_2 SIP for the Weirton SO_2 nonattainment area by July 20, 1995, and the area must achieve attainment as expeditiously as practicable, but no later than 5 years after the nonattainment designation. Clean Air Act §§ 191(a) and 192(a). 42 U.S.C. §§ 7514(a) and 7514a(a). The June 13, 1994 letter to West Virginia affirmed these dates for the Weirton area. Therefore, the Weirton area must achieve SO_2 attainment by January 20, 1999. The Proposed Rule apparently has also been drafted to address this concern.

III. The Fuel-Use Restrictions and Emission Limitations in the Proposed Rule are not Supported by Available Modeling and Technical Information

The Proposed Rule contains fuel-use restrictions and emission limitations for several emission units located at the WSC facility. The emission limitations, as proposed, are arbitrary in that (1) there is insufficient modeling to demonstrate that the Weirton SO_2 nonattainment area would achieve attainment for SO_2 if these emission limitations were implemented and enforced; and (2) requiring implementation of the fuel-use and emission limitations in the Proposed Rule would have a significant financial impact on WSC with no correlation to demonstrated attainment in the Weirton SO_2 nonattainment area; and (3) the fuel-use restrictions and emission limitations imposed on WSC sources do not adequately consider the significant ambient impact of the W.H. Sammis facility on the New Manchester-Grant SO_2 nonattainment area.

A. Insufficient Modeling and Technical Bases to Demonstrate Attainment in the New Manchester-Grant Magisterial District or Weirton SO_2 Nonattainment Areas

The Proposed Rule contains fuel-use restrictions and emission limitations for the following WSC emission units;

1. High Pressure Boilers Nos. 1, 2, 3, 4 and 5;
2. Low Pressure Boiler Nos. 1 and 2;
3. BOF Waste Heat Boilers;
4. Reheat Furnaces Nos. 1 and 2;
5. Sinter Plant;

6. Slag Granulator;
7. Low Pressure Boiler No. 15;
8. Two Foster Wheeler Boilers;
9. Combustion sources at the Hydrochloric Acid Regeneration Plant, Continuous Annealing Facility, Jumbo Annealing Facility, Detinning Facility, Galvanizing Facility, and Blast Furnace Stoves;
10. Boilers, Process Heaters, Incinerators or Flares with a Design Heat Input Greater than 3 mmBTU/hour; and
11. Process Units with an Exhaust Gas Stream Containing with an SO_2 Concentration Greater than 50 ppm by Volume.

The fuel-use restrictions and emission limitations proposed for the above-listed emission units are not based on modeling or other technical bases which demonstrate SO_2 attainment on a modeled basis in the Weirton SO_2 nonattainment areas. Rather, the fuel-use restrictions and emission limitations proposed for the above-listed emission units were selected from various regulatory sources and considered by DEP to constitute best available control technology ("BACT"). BACT-emission levels (if these emission limitations are in fact BACT) do not guarantee a modeled demonstration of SO_2 attainment in Weirton. Therefore, these fuel-use restrictions and emission limitations are not appropriate. Instead, DEP should review modeling recently completed by WSC and Quaker State for New Manchester-Grant and conduct additional technical studies and evaluate other options, including the use of emissions rollback modeling to obtain appropriate SO_2 emission limits which will model attainment in the Weirton SO_2 nonattainment areas.[1]

In addition, because the emission limitations apply only to specific WSC sources, the SO_2 emission limits should be expressed in lbs. SO_2/hour rather than lbs. SO_2/mmBTU. This change should be made because the lbs. SO_2/hour standard is consistent with the IGM and CT SCREEN SO_2 modeling requirements as well as rollback modeling protocols.

Based on recent modeling, WSC will agree to a reduction in allowable SO_2 emissions of approximately 70% in order to demonstrate attainment in the New Manchester-Grant area. WSC is also committed to achieving SO_2 attainment in Weirton, but it believes additional studies of the area are necessary to develop a technically sound and fair approach to regulating SO_2 emissions which impact the Weirton SO_2 nonattainment area.

[1]Because the IGM model is unable to accurately predict ambient impact in complex, rough terrain areas within 2 kilometers of the modeled emission units, the IGM model by itself cannot be utilized to develop and SO_2 attainment strategy for the Weirton SO_2 nonattainment area. Therefore, WSC believes that emissions rollback modeling should be utilized in developing an SO_2 attainment demonstration for WSC emission units.

B. Implementation of Fuel-Use Restrictions and Emission Limitations in the Proposed Rule will have a Significant Financial Impact on WSC with no Correlation of a Demonstration of Attainment in the Weirton SO_2 Nonattainment Area

The implementation of the Proposed Rule would require significant changes at the WSC facility. In particular, the Proposed Rule would require WSC to make significant and expensive changes, including changes in coal types and fuel-switching at certain emission units. The Proposed Rule would also require the installation and operation of continuous emission monitors ("CEMs") at a number of WSC emission units. This significant financial commitment would not, as described above, enable DEP to make a modeled demonstration of attainment in the Weirton SO_2 nonattainment area. Clearly, if WSC is required to make significant financial expenditures to demonstrate attainment in Weirton, DEP must be able to show that the emission limitations and changes in fuel use required at WSC will result in a modeled SO_2 attainment demonstration in Weirton.

C. The SO_2 Ambient Impact of Other Area Facilities

The W.H. Sammis facility is located in Stratton, Ohio and is owned and operated by the Ohio Edison Company. It has SO_2 emission limits for boilers 1-4 of 1.61 lbs. SO_2/mmBTU and 4.46 lbs. SO_2/mmBTU for boilers 5-7. Based upon the IGM model, it has been shown that the W.H. Sammis facility has an approximate SO_2 modeled ambient impact in the New Manchester-Grant SO_2 nonattainment area two to three times greater than that of WSC.

In addition, modeling has demonstrated that the W.H. Sammis facility "significantly contributes"[2] to the modeled SO_2 nonattainment status in New Manchester-Grant. As such, the Ohio SO_2 SIP violates Clean Air Act § 110(a)(2)(D) which precludes sources in one state from "contributing significantly to the nonattainment" in another state.

WSC recognizes that DEP cannot adopt regulations limiting the SO_2 emissions of a source located in Ohio, but DEP should initiate discussions with the Ohio Environmental Protection Agency ("OEPA") to achieve the appropriate SO_2 emission reductions at W.H. Sammis rather than compel sources in West Virginia to make all of the SO_2 emission reductions necessary to demonstrate modeled SO_2 attainment in New Manchester-Grant. To date, WSC is not aware of any efforts by DEP to discuss this important issue with OEPA.

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[2] A major source "significantly contributes" to nonattainment in a given area if that source exceeds an annual SO_2 impact of 1.0 $\mu g/m^3$ at a receptor that models above the annual standard. 5 $\mu g/m^3$ at a receptor that models above for the 24-hour standard or 25 $\mu g/m^3$ at a receptor that models above the 3-hour standard. See, 40 C.F.R. § 51.165(b)(2). Air dispersion modeling shows that the Sammis facility exceeds the 1.0 $\mu g/m^3$ annual standard under the facility's current operating scenario. Therefore, based upon the available modeling, the Sammis facility is significantly contributing to modeled SO_2 nonattainment in New Manchester-Grant and should be subject to additional Clean Air Act Title I SO_2 limitations in order to enable this area to demonstrate attainment by the required February 5, 1995 deadline.

WSC also believes that other utility facilities may be impacting both the New Manchester-Grant and Weirton SO_2 nonattainment areas. WSC believes additional studies must be undertaken by DEP to identify other potential contributors to SO_2 nonattainment in both New Manchester-Grant and in Weirton.

IV. Compliance Testing and Monitoring Requirements

The Proposed Rule § 5.1a requires the installation and operation of CEMs on the following WSC emission units:

1. High Pressure Boilers Nos. 1, 2, 3 and 4;
2. Low Pressure Boilers Nos. 1 and 2;
3. BOF Waste Heat Boiler;
4. Reheat Furnaces Nos. 1 and 2; and
5. Sinter Plant

WSC objects to this CEM requirement. WSC objects that the term "continuous emission monitoring" is unreasonably vague such that it prevents the regulated community (in this case, WSC) from determining what specifically is required in terms of source monitoring. WSC also objects to the CEM requirement because there is no underlying technical justification for the SO_2 emission limitations at these emission units, and therefore, there is no basis to require the installation and operation of a CEM to record SO_2 emissions.

In addition, WSC believes there is no basis to require CEMs because these emission units are not subject to New Source Performance Standards ("NSPS") CEM requirements. Moreover, the difficulty of installing, calibrating, and maintaining a CEM at these emission units makes the installation of a CEM unreasonable for these emission units. Rather, WSC should be able to develop parametric monitoring for these emission units to provide the required SO_2 emission monitoring at a significantly lower cost.

Finally, the federal proposed enhanced monitoring rule and Clean air Act Title V periodic monitoring guidance are the appropriate mechanisms to address SO_2 monitoring for these emission units. Because it is unclear what type of monitoring will be required for these emission units pursuant to the federal enhanced monitoring rule or the Title V periodic monitoring guidance, requiring CEMs pursuant to this Proposed Rule may be inconsistent with the monitoring required under these federal programs. Therefore, WSC believes all CEM requirements should be deleted from the Proposed Rule.

Alternately, if it is determined that CEMs are required for this rule, WSC agrees to install and maintain a CEM at the C & D stack to record SO_2 emission from High Pressure Boilers Nos. 1 through 4 while burning coal. WSC believes that parametric monitoring must be available for other emission sources and will develop a monitoring protocol for these sources to provide adequate monitoring.

V. Recordkeeping and Reporting Requirements

Because the recordkeeping and reporting provisions are largely borrowed from 40 C.F.R. § 60.7, it is arbitrary to require records retention when it is not required under the borrowed federal regulation. Likewise, it is also arbitrary to require an extended records retention period when a shorter period is provided in the federal regulation. Thus, WSC objects to (1) the 5-year record retention requirements for records pertaining to startups, shutdowns and malfunctions (Proposed Rule - § 6.3) when the federal regulation has no records retention period; and (2) the 5-year records retention time required for the general file information (Proposed Rule - § 6.4) when the federal regulation provides for a 2-year records retention period.

WSC also objects to the requirement that any emissions test report (Proposed Rule - § 6.5) and any written malfunction report (Proposed Rule - § 6.6) be certified by the owner or operator prior to submission to the Division. The certification requirements in the Proposed Rule are onerous, unnecessary and, like the monitoring requirements, will be appropriately addressed through Clean Air Act Title V implementation.

VI. Stack Height Issues

There is no modeling or other technical bases available to support the requirement that WSC extend its stacks to GEP stack height for High Pressure Boilers 1, 2, 3 and 4 pursuant to Proposed Rule § 8.1. Compelling a stack height increase for these boilers would again require WSC to expend significant resources with no certainty that such stack height increases would result in demonstrated attainment in the Weirton SO_2 nonattainment area.

In addition, WSC believes that stack height provisions cannot be utilized to compel WSC to increase stack heights, but rather, these provisions may only be used to limit certain stack height increases. WSC also believes that Proposed Rule § 8.3 improperly enables DEP and U.S. EPA to compel stack height increases at WSC. Moreover, this provision improperly gives DEP and U.S. EPA discretion to allow less than GEP stack height if WSC makes the proper demonstration. If WSC is required to increase stack heights to GEP heights, the waiver from GEP stack height should be made mandatory if WSC can make the proper demonstration.

VII. General Limits

A. Definitions

WSC objects to the definition of "Modification" (§ 2.14) because there are no exceptions in the definition save the de minimis emission increase levels. WSC does not believe that the de minimus emission level is based on modeling or other technical bases.

B. Other Facilities Impacting the New Manchester-Grant and Weirton SO_2 Nonattainment Areas

WSC is concerned that it has been effectively targeted by DEP as an entity that must reduce SO_2 emissions through use of lower sulfur-content fuels and compelled GEP height stacks despite the fact that both West Virginia and Ohio electric utilities continue to use higher sulfur-content fuels, have high SO_2 allowable and actual emission rates, and emit from tall stacks grandfathered into the GEP stack height rules. It appears to WSC that the electric utilities should be included in this process in order to produce an equitable result with significantly more environmental benefit.

VIII. Conclusion

In conclusion, the Division should withdraw the Proposed Rule and enter into consent orders with WSC and Quaker State to address the New Manchester-Grant SO_2 nonattainment area. DEP should also remove any requirements in the Proposed Rule pertaining to the Weirton SO_2 nonattainment area, and following the completion of the additional technical work being performed by WSC, DEP and WSC should develop a second consent order to support an attainment demonstration for the Weirton, West Virginia SO_2 nonattainment area.

If you require any further information or have any questions with respect to the issues raised herein, please contact me.

Very truly yours,

Gene P. Current

Gene P. Current
Director, Environmental Control

COMMENTS TO THE WVDEP OFFICE OF AIR QUALITY AUGUST 9, 1994 PUBLIC HEARING ON PROPOSED WV REGULATION 45CSR37

A. Good morning. My name is Gene Current and I am Director of Environmental Control for Weirton Steel Corporation. I appreciate the opportunity to present comments to the WVDEP at this public hearing today. In addition to these verbal comments, more comprehensive written comments are also being submitted.

B Weirton Steel is an employee-owned company which operates an integrated steelmaking facility in Weirton, West Virginia.

C Weirton Steel is West Virginia's largest industrial employer and taxpayer, employing approximately 6,000 people. In addition to its employees, Weirton Steel indirectly supports virtually every business and service in Weirton and the surrounding area.

D Weirton Steel is committed to a healthy environment. During the past 10 years, 103 million dollars have been dedicated for environmental control facilities. This represents 13.3% of the total capital expended over the 10-year period. This percentage far exceeds the steel industry average of 7.5%.

E. Weirton Steel is here today because it very concerned about the WVDEP Office of Air Quality's Regulation 37 which stipulates provisions to control sulfur dioxide emissions in Hancock County.

F. Proposed Regulation 37 is grossly unfair to Weirton Steel for the following reasons.

1. It mandates overly stringent SO_2 limitations in combination with requirements for the installation of Good Engineering Practice (GEP) stacks at the Company's high pressure boiler facilities. These requirements are overkill in that either one of these two stipulations may singly address the Weirton ambient air quality SO_2 exceedance problem. Utilizing the GEP tall stack strategy, utilities in the Ohio/Pennsylvania/West Virginia tri-state area are discharging SO_2 at a rate which is over 100 times that of Weirton Steel. Based upon

F. 1. (contd.)

the installation of GEP stacks alone, local power plants across the river from Weirton, in Ohio, are being permitted emission rates which are as high as six times the proposed Regulation 37 limitation for coal burning units and twelve times the proposed limitation for oil burning units. Should such a disparity exist between facilities in such close proximity? The answer is obviously NO!

2. In a nonattainment area, it is inappropriate and unfair to impose differing SO_2 standards for coal and oil as proposed in Regulation 37. Ambient air quality is governed by a mass per unit time relationship (such as lbs./hour) rather than a mass per unit energy relationship (such as lbs./10^6 BTU of heat input). A lbs./hour standard is also more appropriate in that (1) it is easier to monitor, particularly in multi-fuel sources and (2) it is consistent with modeling protocol. Consequently, a lbs. SO_2/hour standard should be applied to Weirton Steel sources.

3. Regulation 37 stipulates extensive continuous emission monitoring (CEM) requirements. It is the position of Weirton Steel that predictive emission monitoring methods may be applied at its point sources which are far less expensive and just as reliable.

4. There is insufficient technical justification for those requirements in the proposed regulation that relate to the Weirton nonattainment area. At this time, a dispersion modeling attainment demonstration has been achieved for the New Manchester-Grant Magisterial District. However, due to technical problems associated with modeling in complex terrain areas, such an attainment demonstration has not been achieved in Weirton. Additional technical evaluation and studies are, therefore, required to achieve a resolution to the Weirton problem.

F. 5. (contd.)

Proposed Regulation 37 would have a tremendous financial impact on Weirton Steel and its coal supplier, Starvaggi Industries. Local coal mining and industrial jobs are being placed at risk with no demonstrated correlation to SO_2 attainment in the Weirton area. Unfortunately, proposed Regulation 37 has been placed in a fast track mode to address nonattainment issues in the New Manchester-Grant Magisterial District without affording Weirton Steel the opportunity to complete its testing programs which are directed toward the resolution of the local nonattainment problem in Weirton. In order to achieve a well-engineered cost effective solution to the Weirton problem, the New Manchester-Grant and the Weirton nonattainment issues should be addressed separately. Addressing the New Manchester-Grant nonattainment area separately is consistent with the different SIP submittal timeframes and attainment dates applicable to the New Manchester-Grant and Weirton SO_2 nonattainment areas.

G. It should be noted that the majority of the SO_2 ambient impact in the New Manchester-Grant nonattainment area comes from utility sources (primarily the Sammis Power Plant). In this regard, the WVDEP should be contacting Ohio EPA concerning the level of SO_2 emissions at Sammis and the ambient impact from this large Ohio power plant in the New Manchester-Grant area. Despite having only 30-50% of the modeled SO_2 ambient impact of Sammis in the New Manchester-Grant area, Weirton Steel is prepared to make a substantial commitment. Weirton Steel stands ready to negotiate an interim consent order containing SO_2 limitations which are consistent with the modeled attainment demonstration for the New Manchester-Grant nonattainment area. Such an interim draft order has been developed and is presently being reviewed by the Office of Air Quality. The reduction in allowable SO_2 emissions committed in this consent order exceeds 70%.

H. As indicated previously, Weirton Steel is completing studies and technical evaluations to address the Weirton, West Virginia nonattainment area.

1. Weirton Steel believes additional tasks in the form of emission testing, ambient impact and operational studies, and design engineering need to be completed before a revised SO_2 SIP can be developed that will demonstrate attainment in Weirton, West Virginia.

2. Weirton Steel will commit to work with the WVDEP Office of Air Quality to develop a second consent order to address the SO_2 attainment issues in Weirton, West Virginia once these necessary tasks are completed.

3. Given the difficulty of modeling local ambient impacts in Weirton, Weirton Steel also is willing to work toward an attainment demonstration based on an emissions rollback approach and/or a commitment to increase stack heights in accordance with good engineering practice ("GEP") requirements.

J. Conclusion:

1. The WVDEP should withdraw Proposed Regulation 37 and enter into consent orders with Weirton Steel and Quaker State to address the New Manchester-Grant SO_2 nonattainment area.

2. Following the completion of the additional work being performed by Weirton Steel, a second consent order should be developed to support an attainment demonstration for the Weirton, West Virginia area.

G.P.C.
08/07/94

Copy - Dale John Karen W 8/4/94 Ska

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

AUG — 4 1994

Mr. G. Dale Farley, Chief
West Virginia Division of
Environmental Protection
1558 Washington Street, East
Charleston, WV 23511-2599

Dear Mr. Farley:

On behalf of the Environmental Protection Agency (EPA) Region III, I would like to provide comments on West Virginia Rule 45CSR37 - "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County." The subject rule, as proposed, is well constructed and appears to contain all of the regulatory and compliance provisions necessary to allow for the achievement of the goal of this rule. It should be noted that the adequacy of the various emission limits have not be substantively evaluated because a technical analysis justifying the limits does not accompany the rule. Therefore, EPA withholds judgement with regard to the adequacy of these limits until such time that it receives a technical analysis.

I would like to highlight a number of provisions in 45CSR37 that substantiate the adequacy of this rule:

- The compliance averaging times are precise and adequate to demonstrate compliance with the short-term national ambient air quality standards (NAAQS) for sulfur dioxide (SO_2).

- The requirement for certain sources of emissions to demonstrate compliance using continuous emissions monitoring (CEM) equipment is endorsed by EPA as the preferred method of compliance monitoring.

- The allowance for West Virginia's use of "any other credible evidence" in determining compliance comports with EPA's enhanced monitoring policy.

- The maintenance of compliance records for five years follows EPA policies on recordkeeping and reporting.

EPA has one point of concern with regard to 45CSR37. Section 45-37-9.1 requires affected sources to provide for compliance with the rule "as expeditiously as practicable but not later than twelve (12) months" from the effective date of the rule. Understanding that 45CSR37 will not be considered by the West Virginia Legislature until February 1995, EPA is concerned

about the State's ability to meet the February 5, 1995 attainment date for the New Manchester-Grant Magisterial District SO_2 nonattainment area as established by section 192(c) of the Clean Air Act. The addition of explicit compliance milestones in the rule, or as an addendum to the rule, would demonstrate West Virginia's good faith efforts to meet the February 5, 1995 attainment date milestone. Further, it is suggested that the notion of providing for compliance as "expeditiously as possible" be stressed to the affected sources.

If you have any questions regarding these comments, please contact me at 215 597-9781.

Sincerely,

David J. Campbell
Environmental Engineer

cc: Mr. Terry Polen
West Virginia Office of Air Quality
Northern Panhandle Office

[redacted]

Copy - Dale John Kathy W 8/9/94 sta

I agree

BABST
CALLAND
CLEMENTS
AND
ZOMNIR
A PROFESSIONAL CORPORATION

CHRISTOPHER W. ARMSTRONG
Attorney at Law
(412) 394-5427

August 8, 1994

West Virginia Division of
Environmental Protection
Office of Air Quality
1558 Washington Street, East
Charleston, West Virginia 25311

RE: Quaker State Corporation Comments Regarding Proposed Regulation 37, "Provisions for Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County"

Dear Sir/Madam:

Babst, Calland, Clements and Zomnir, P.C., hereby submits the following comments on behalf of Quaker State Corporation ("Quaker State") regarding Proposed Regulation 37, "Provisions to Control Sulfur Dioxide Emissions and Ambient Air Quality Levels of Sulfur Dioxide in Hancock County" (the "Proposed Rule"). The Proposed Rule has been developed to address the New Manchester-Grant Magisterial District ("New Manchester-Grant") and the City of Weirton ("Weirton") sulfur dioxide ("SO_2") nonattainment areas so that these SO_2 nonattainment areas will achieve and maintain the National Ambient Air Quality Standards ("NAAQS") for SO_2 within the federal Clean Air Act-mandated timeframes. Quaker State's comments primarily focus on the lack of a technical basis for, and significant economic impact of the Proposed Rule.

I. Introduction

Quaker State owns and operates an oil refinery at its Congo Plant in Newell, West Virginia in northern Hancock County. The Quaker State Congo facility refines crude oil to produce motor oil, gasoline, distillate fuel, industrial fuel oil and semi-finished wax. Since its opening in 1971, Quaker State has invested significant resources in reducing air emissions pursuant to both state and federal environmental regulations.

Two Gateway Center, Eighth Floor
Pittsburgh, Pennsylvania 15222
412 - 394-5400
Fax 412 - 394-6576

[redacted]

Quaker State is concerned with the regulatory approach taken by the West Virginia Division of Environmental Protection, Office of Air Quality ("DEP" or the "Division") in the Proposed Rule. Consequently, Quaker State believes that the SO_2 program for Quaker State's Congo facility must be modified in order to properly address the modeled SO_2 nonattainment issue in New Manchester-Grant.

II. History of SO_2 Nonattainment in Hancock County, West Virginia

New Manchester-Grant was originally designated as an SO_2 nonattainment area on September 12, 1978. 43 Fed. Reg. 40502. Although this area has not had a monitored exceedance of the SO_2 NAAQS since 1984, the area has remained nonattainment for SO_2, apparently because the state was previously unable to demonstrate SO_2 attainment in the area through dispersion modeling.

On February 5, 1990, the United States Environmental Protection Agency ("U.S. EPA") issued a state implementation plan ("SIP") call to the state of West Virginia requiring, inter alia, a revised SIP to address the attainment and maintenance of the SO_2 NAAQS in all of Hancock County, West Virginia. Despite requesting additional time to develop a revised SO_2 SIP, West Virginia did not formally submit a revised SO_2 SIP pursuant to the SIP call.

The Clean Air Act Amendments of 1990 (the "1990 Amendments") were signed into law on November 15, 1990 and retained all existing nonattainment areas by "operation of law", including New Manchester-Grant. Clean Air Act § 107(d)(1)(C), 42 U.S.C. § 7407(d)(1)(C). The 1990 Amendments require that states with areas designated nonattainment for SO_2 by operation of law must submit to U.S. EPA a revised SO_2 state implementation plan ("SIP") by May 15, 1992, and the nonattainment area must achieve attainment by November 15, 1995. Clean Air Act §§ 191(b) and 192(b), 42 U.S.C. §§ 7514(b) and 7514a(b).

On January 30, 1991, U.S. EPA informed West Virginia that pursuant to Clean Air Act § 191(b), a revised SO_2 SIP submission was required for the New Manchester-Grant area no later than May 15, 1992. In response, DEP submitted a committal SIP for this area on August 11, 1993. The committal SIP provided an outline of the steps required for completion of the SO_2 SIP revision, with the final submittal to U.S. EPA occurring on December 1, 1994. It appeared that during this process U.S. EPA believed that the new Manchester-Grant area was subject to the SO_2 SIP revision deadlines in Clean Air Act § 191(b) and the SO_2 attainment deadlines in Clean Air Act § 192(b).

However, by a letter dated June 13, 1994, U.S. EPA informed West Virginia that Clean Air Act §§ 191(b) and 192(b) do not apply to the New Manchester-Grant area. Rather, U.S. EPA believes Clean Air Act § 192(c) (pertaining to inadequate SIPs) applies to this particular situation. Clean Air Act § 192(c) has no deadline for the submission of revised SO_2 SIPs, but it does require attainment of the NAAQs within 5 years of the finding that the particular SIP is inadequate.

Therefore, because the February 5, 1990 SIP call constituted the original inadequacy finding, attainment of the SO_2 NAAQS in New Manchester-Grant must be achieved by February 5, 1995.

U.S. EPA has also indicated that as a result of the confusion caused by its misinterpretation of Clean Air Act § 191(b), it is establishing December 1, 1994 as the revised SO_2 submittal date for the New Manchester-Grant area. The Proposed Rule is being developed to address this requirement.

Weirton, West Virginia, including the Butler and Clay Magisterial Districts, was designated as an SO_2 nonattainment area effective on January 20, 1994. 58 Fed. Reg. 67334 (December 21, 1993). DEP must submit a revised SO_2 SIP for the Weirton SO_2 nonattainment area by July 20, 1995, and the area must achieve attainment as expeditiously as practicable, but no later than 5 years after being designated nonattainment. Clean Air Act §§ 191(a) and 192(a), 42 U.S.C. §§ 7514(a) and 7514a(a). The June 13, 1994 letter to West Virginia affirmed these dates for the Weirton area. Therefore, the Weirton area must achieve SO_2 attainment by January 20, 1999. The Proposed Rule apparently has been drafted to address this concern.

III. The Fuel-Use Restrictions and Emission Limitations in the Proposed Rule are not Supported by Available Modeling and Technical Information

The Proposed Rule contains fuel-use restrictions and emission limitations for SO_2 emission units located at the Quaker State facility. The emission limitations as proposed are arbitrary in that (1) available modeling does not indicate that the stack height requirements, emission limitations and fuel-use restrictions are necessary to demonstrate attainment in New Manchester-Grant; and (2) the implementation of the stack height requirements, fuel-use restrictions and emission limitations in the Proposed Rule would have a significant financial impact on Quaker State where modeling exists that demonstrates attainment in the New Manchester-Grant SO_2 nonattainment area with more flexible fuel-use restrictions and with no stack height increases.

A. There is No Modeling or Other Technical Bases Available to Demonstrate that Quaker State must Implement the Combination of Stack Height Increases, Fuel-Use Restrictions and Emission Limitations in Order to Achieve Attainment in the New Manchester-Grant SO_2 Nonattainment Area

The Proposed Rule contains fuel-use restrictions and emission limitations for the following Quaker State emission units:

1. Fluidized-Bed Boilers Nos. 1 and 2;

2. Fuel Oil-Fired Boilers A and B;

3. Isomax Unit Heater (H-605);

4. Vacuum Fractionator Heater (H-701);

5. Process Heaters H-101, H-501/6 and H-601/4;

6. Other Process Heaters; and

7. Boilers, Process Heaters, Incinerators or Flares with a Design Heat Input Greater than 3 mmBtu/hr.

The fuel-use restrictions and emission limitations proposed for the above-listed emission units are not derived from U.S. EPA-acceptable modeling procedures. Quaker State has developed modeling consistent with U.S. EPA technical comments which enables it to demonstrate attainment in the Manchester-Grant SO_2 nonattainment area with increased fuel-use flexibility and without employing GEP stack height increases as in the Proposed Rule. Pursuant to the recommendation of U.S. EPA Region III in a June 20, 1994 to letter DEP, Quaker State conducted modeling utilizing CT SCREEN to address the "near-field" SO_2 ambient impact of Quaker State's SO_2 emissions. The CT SCREEN model demonstrates that no stack height increases are necessary in order to demonstrate attainment with the alternate fuel-use restrictions and emissions limitations proposed by Quaker State.

The prohibition of firing refinery fuel gas or other process gas streams in any combustion device with greater than 50 grains of hydrogen sulfide per dry standard cubic feet should be deleted based on the modeling results as well. The modeling demonstrates that flaring of untreated sour gas does not result in modeled violations of the SO_2 NAAQS.[1]

Finally because the emission limitations apply only to specific Quaker State sources, the SO_2 emission limits should be expressed in lbs. SO_2/hr. rather than lbs. SO_2/mmBtu. This change should be made because the lbs. SO_2/hr. standard is easier to monitor, particularly in Quaker State's multi-fuel sources and because the lbs. SO_2/hr. standard is consistent with the IGM and CT SCREEN SO_2 modeling approach.

B. The Implementation of the Stack Height Requirements, Fuel-Use Restrictions and Emission Limitations as Proposed will have a Significant Financial Impact on Quaker

[1]Proposed Rule § 4.2.c. provides "[n]o refinery fuel gas or other process gas stream shall be fired in any combustion device, including but not limited to, boilers, process heaters, incinerators, and flares, which contains greater than 50 grains of hydrogen sulfide per dry standard cubic feet of gas." Quaker State believes the Division intended that the hydrogen sulfide content in refinery fuel gas or other process gas streams be limited to 50 grains per 100 cubic feet of gas. At any rate, Quaker State believes this prohibition should be deleted in its entirety.

State and is Unwarranted where Modeling Demonstrates Attainment in the New Manchester-Grant SO_2 Nonattainment Area with More Flexible Fuel-Use Restrictions and Without Stack Height Increases

The implementation of the Proposed Rule would require significant changes at the Quaker State facility. In particular, the Proposed Rule would require costly changes at Quaker State in fuel usage, including fuel switches and would require the installation and operation of continuous emission monitors ("CEMs"). This significant financial commitment would not, as described above, be required to make a modeled demonstration of attainment in the New Manchester-Grant SO_2 nonattainment area.

As described above, Quaker State has conducted modeling consistent with U.S. EPA proposals utilizing CT SCREEN, and has demonstrated that no stack height increases and more flexible fuel-use restrictions will result in modeled attainment in the New Manchester-Grant SO_2 nonattainment area.

IV. Compliance Testing and Monitoring Requirements

The Proposed Rules §§ 5.1. and 5.2 requires the installation and operation of CEMs on the following Quaker State emission units:

1. Fluidized-Bed Boilers Nos. 1 and 2;

2. Fuel Oil-Fired Boilers A and B; and

3. All Refinery Fuel Gas Streams.

Quaker State objects that the term "continuous emission monitoring" is unreasonably vague such that it prevents the regulated community (in this case, Quaker State) from determining what is required in terms of source monitoring. Quaker State also objects to the CEM requirement because there is no underlying technical justification for the SO_2 emission limitations at these emission units, and therefore, there is no basis to require the installation and operation of a CEM to record SO_2 emissions.

Moreover, the difficulty of installing, calibrating, and maintaining a CEM at these emission units makes the installation of a CEM unreasonable for these emission units. Rather, Quaker State should be able to develop parametric monitoring for these emission units to provide the required SO_2 emission information at a significantly lower cost.

Finally, the federal enhanced monitoring rule and Clean Air Act Title V periodic monitoring guidance are the appropriate mechanisms to address SO_2 monitoring for these emission units.

Because it is unclear what type of monitoring will be required for these emission units pursuant to the federal enhanced monitoring rule or the Title V periodic monitoring guidance, requiring CEMs pursuant to this Proposed Rule may be inconsistent with the monitoring required under these federal programs. Therefore, all CEM requirements should be deleted from the Proposed Rule.

Alternatively, if it is determined that CEMs are required for this rule, Quaker State agrees to install and maintain a CEM at the No. 1 and 2 fluidized-bed boiler stacks and A and B fuel oil-fired boiler stacks. Quaker State believes that parametric monitoring must be available for other emission sources and will develop a monitoring protocol for these sources to provide adequate monitoring.

V. Recordkeeping and Reporting Requirements

Because the recordkeeping and reporting provisions are largely borrowed from 40 C.F.R. § 60.7, it is arbitrary to require records retention when not required under the federal regulation. Likewise, it is also arbitrary to require an extended records retention period when a shorter period is provided in the federal regulation. Thus, Quaker State objects to (1) the 5-year records retention requirements for records pertaining to startups, shutdowns and malfunctions (Proposed Rule - § 6.3) and to (2) the 5-year records retention time required for the general file information (Proposed Rule - § 6.4).

Quaker State also objects to the requirement that any emissions test report (Proposed Rule - § 6.5) and any written malfunction report (Proposed Rule - § 6.6) be certified by the owner or operator prior to submission to the Division. The certification requirements are onerous, unnecessary and, like the monitoring requirements, will be addressed through Clean Air Act Title V implementation.

VI. Stack Height Issues

There is no modeling or other technical bases available to support the requirement that Quaker State extend its stacks to GEP stack height for Fluidized-Bed Boilers Nos. 1 and 2 and Fuel Oil-Fired Boilers A and B pursuant to Proposed Rule § 8.2. Compelling a stack height increase for these boilers would require Quaker State to unnecessarily expend significant financial resources when Quaker State has modeling which demonstrates attainment in the New Manchester-Grant SO_2 nonattainment area without a stack height increase.

In addition, Quaker State believes that stack height provisions cannot be utilized to compel Quaker State to increase stack heights, but rather, these provisions may only be used to limit certain stack height increases. Quaker State also believes that Proposed Rule § 8.3 improperly enables DEP and U.S. EPA to compel stack height increases at Quaker State. Moreover, this provision improperly gives DEP and U.S. EPA discretion to allow less than GEP stack height if Quaker State

makes the proper demonstration. If Quaker State is required to increase stack heights to GEP heights, the waiver from GEP stack height should be made mandatory if Quaker State can make the proper demonstration.

VII. General Issues

A. Definitions

Quaker State objects to the definitions in the Proposed Rule of "Modification" (§ 2.14) and "Refinery fuel gas" (§ 2.18). Quaker State believes the term "Modification" inappropriately contains no exceptions save the de minimis emission increase level. The term "Refinery fuel gas" should be redefined to eliminate sour gas because Quaker State's modeling demonstrates that direct flaring of the sour gas would not cause a modeled violation of the SO_2 NAAQS.

B. Other Facilities Impacting the New Manchester-Grant SO_2 Nonattainment Area

Quaker State believes the Proposed Rule will result in the inequitable treatment of West Virginia sources when the largest modeled ambient impact is from the Ohio electric utility, the W.H. Sammis facility in Stratton, Ohio. As a West Virginia agency, DEP should initiate negotiations with the Ohio Environmental Protection Agency concerning possible SO_2 reductions from the W.H. Sammis facility before imposing significant SO_2 emission reductions on West Virginia facilities.

VIII. Conclusion

In conclusion, the Division should withdraw Proposed Regulation 37 and enter into consent orders with Weirton Steel and Quaker State to address the New Manchester-Grant SO_2 nonattainment area based on the modeling developed by Weirton Steel and Quaker State.

If DEP requires any further information or have any questions with respect to the issues raised herein, please contact me.

Sincerely,

Christopher W. Armstrong

CWA/saz

cc: Mary Ransford White, Esquire
E.W. Tripp
Ronald K. Ryan

WVDEP/OAQ RESPONSE TO PUBLIC COMMENT
ON PROPOSED 45CSR37
PROVISIONS TO CONTROL SULFUR DIOXIDE EMISSIONS
AND AMBIENT AIR QUALITY LEVELS OF SULFUR DIOXIDE
IN HANCOCK COUNTY

Written comments concerning this proposed rule were received from Weirton Steel Corporation (WSC), Quaker State Corporation (QSC), the West Virginia Manufacturers Association (WVMA), and the United States Environmental Protection Agency (USEPA). Oral comments were made at the August 9, 1994, public hearing by representatives of the Weirton Steel and Quaker State Corporations, by a representative of Starvaggi Industries and by the Chief of the Office of Air Quality of the West Virginia Division of Environmental Protection (OAQ). The OAQ Chief's comments at the hearing consisted of an extremely brief statement of the ambient air quality problem and regulatory history in Hancock County. He also made a statement that the OAQ has been discussing SO_2 emissions control issues with both WSC and QSC for some time with the objective of developing consent orders to address the SO_2 nonattainment problem. He also highlighted two errors contained in the proposed rule; specifically that the reference to Quaker State Corporation should be changed to Quaker State Corporation and that subsection 4.2.c (4.2(a) was erroneously noted in the hearing transcript) should have stated an emission standard of "50 grains of hydrogen sulfide per 100 dry standard cubic feet of gas" rather than "50 grains of hydrogen sulfide per standard cubic feet of gas."

The oral and written comments from WSC, QSC, WVMA, Starvaggi Industries, and USEPA will be combined where any overlap or close similarity exists and will be summarized and characterized with the OAQ response following the comment.

1. Both QSC and WSC commenters broadly characterized the requirements of this proposed rule as unfair to WSC and QSC and without technical justification.

Response: Beyond this broad comment, both WSC and QSC raise objections to particular provisions of proposed 45CSR37 which may be more specifically addressed in other responses. OAQ response to this broad characterization of the proposed rule, however, warrants considerable discussion.

WSC and QSC provided, within their comments, a history of the Hancock County SO_2 nonattainment issue which the OAQ believes contains essentially factual information with some minor corrections. Neither the WSC/QSC historical summary nor the different historical summary provided by USEPA in recent letters to West Virginia discuss or recognize activities that have been undertaken and completed or attempted and abandoned to develop an understanding of and solution to the Hancock County SO_2 problem.

In the late 1980's, USEPA and West Virginia, in conjunction with Ohio and Pennsylvania, attempted to design and implement a regional SO_2 impact study encompassing much of the Northern Panhandle area of West Virginia and the nearby bordering areas of Ohio and Pennsylvania. This initiative, referred to as the PAWVOH study, had primary objectives of developing regional scale databases and testing of dispersion models to determine the geographic scope of the area's SO_2

problem and to select tools (such as acceptable models) to develop any required remedial strategies. Despite considerable early efforts to design the study by USEPA and West Virginia personnel, expenditures of significant funds by EPA to purchase monitoring equipment and much work by OAQ staff to site and service SO_2 and meteorological monitoring stations, the PAWVOH study was not completed and only produced minimal results. In the critical area of dispersion modeling tests and development, the PAWVOH study produced essentially no results. Given the complexity of terrain, spatial distribution and diversity of source emission parameters and emission rates, complex meteorology and other factors, development of fully acceptable data bases and analytical tools has been seriously impaired by the termination of the PAWVOH study.

Notwithstanding the limitations resulting from the demise of the PAWVOH study, OAQ has established fully instrumented meteorological monitoring towers at Weirton and Follansbee and expanded SO_2 ambient monitoring sites in Hancock County from two in 1990 to seven as of 1993. OAQ has also greatly improved emissions data bases for SO_2 sources in the area and has completed extensive dispersion modeling analyses of Hancock County area emission sources utilizing USEPA-approved dispersion models, some of which have only become available within the last two years. The OAQ has considerable reservations concerning the absolute accuracy of USEPA-approved dispersion models which may be used in areas like Hancock County. However, much work has been expended in improving the emissions and meteorological data inputs to these models and in obtaining follow-up, real time ambient SO_2 measurements in Hancock County, particularly in Weirton. This work has led the OAQ to conclude that there are serious violations of the 3-hour, 24-hour, and annual national and state health and welfare standards (NAAQS) for sulfur dioxide occurring in the Weirton area of Hancock County. The SO_2 and meteorological monitoring data, dispersion modeling results, source analyses and common sense leads the OAQ to conclude that the major cause of the SO_2 ambient standard violations is SO_2 emissions from Weirton Steel Corporation's steel production facilities in Weirton.

OAQ concluded from earlier analyses that the existing state implementation plan (SIP) for sulfur dioxide, currently consisting of SO_2 emission standards in 45CSR10, is grossly inadequate to effect necessary emission limits at Quaker State Corporation's Congo refinery and Weirton Steel Corporation's facilities. It should be noted, however, that actual SO_2 emission levels at both facilities are substantially below the allowable levels established by 45CSR10. Furthermore, it should be noted that OAQ permits and orders applicable to the Quaker State facility establish substantially lower SO_2 limits for that facility than allowed by 45CSR10. Such permit limits, however, have not been demonstrated through dispersion modeling to be sufficient to assure attainment of the SO_2 ambient standards, necessitating additional conditions such as those proposed in 45CSR37.

2. WSC, QSC, and Starvaggi Industries commented that SO_2 emissions from nearby power plants in Ohio (Sammis and Cardinal Stations) were overwhelmingly higher than those of WSC and QSC and that the proposed emission standards for WSC and QSC are much more stringent than the Ohio emission standards for those utilities.

Response: OAQ is very much aware of and sensitive to the fact that very large mass emissions of SO_2 are allowed and occur at the W.H. Sammis and Cardinal plants of Ohio Edison located north and south of the Weirton area, respectively. Ohio's SO_2 emission limitations for these plants reflect the high sulfur content of local coal and are considered to be very lenient. OAQ also, unfortunately, understands that Phase I of the Acid Rain Program under the Clean Air Act apparently has not triggered any early SO_2 emissions reductions at these plants.

It must be recognized, however, that neither the many air quality impact (modeling) analyses nor the expanded SO_2 monitoring program have, to date, clearly implicated SO_2 emissions from the tall Sammis and Cardinal stacks as primary contributors to the real and serious ambient SO_2 problem in Weirton or to any clearly established SO_2 ambient problem in the Grant-New Manchester Magisterial District of Hancock County. Although these plants are not believed to be the primary contributors to SO_2 ambient violations in Hancock County, modeling results indicate that the Sammis and Cardinal plants cause significant ambient SO_2 impacts in West Virginia and WVDEP may consider petitioning USEPA and the State of Ohio to revise the emission limitations for these plants to effect full remediation of the Hancock County SO_2 problem. A decision in this matter must be reached as West Virginia works to develop an attainment demonstration for this area that can be approved by USEPA.

3. In further expansion upon the fairness/technical basis issue raised in Comment 1, WSC comments that the emission limitations for WSC are not based upon modeling or other technical bases which demonstrate attainment in the Weirton area but are based upon application of "Best Available Control Technology (BACT)" standards.

Response: OAQ disagrees that the proposed emission limitations represent BACT as such standards would relate to a new facility. The proposed limits for boiler emissions in particular are based partly upon OAQ's understanding of the actual operating situation at the Quaker State facility and partly upon a judgment of what standards can feasibly be met and, therefore, should be met at the Weirton Steel facility. It must be clearly emphasized that OAQ seeks to achieve the following objectives through implementation of the proposed provisions of 45CSR37:

(a) To achieve a modeled demonstration of attainment in the Grant-New Manchester Magisterial District which has a near term attainment deadline (February 1995) under the federal Clean Air Act, as amended.

(b) To expeditiously achieve SO_2 emissions reductions in the Weirton area sufficient to reduce monitored SO_2 ambient concentrations to the level of the ambient SO_2 health standards or to levels better than those standards.

WSC is correct in stating that the emission limitations and other requirements of proposed 45CSR37 are not based upon a modeled attainment demonstration with respect to air quality in Weirton. 45CSR37 would have to incorporate more severe and restrictive measures for WSC than those currently proposed in order for attainment to be demonstrated via the most recently completed dispersion modeling analyses. The proposed regulation targets actual SO_2 emission reductions at WSC at a factor of 2 to 4 below the current actual hourly/daily levels consistent with the

extent of measured NAAQS violations found at OAQ's Weirton monitoring stations. The latest dispersion modeling results indicate that a 14-fold reduction in SO_2 emissions at WSC would be required to demonstrate attainment in the area. OAQ has not incorporated such severe reduction requirements into 45CSR37 because OAQ does not believe such limits can be achieved. OAQ recognizes that it faces a formidable and uncertain task in demonstrating (to USEPA) attainment with the ambient health standards in the Weirton area even with 45CSR37 enacted and implemented. In the absence of very convincing analyses from WSC and QSC, however, that the proposed rule provisions cannot economically be met, OAQ believes that the 45CSR37 requirements are necessary, fair, and attainable.

4. Both WSC and QSC objected to Section 8 of the proposed rule which required a GEP (good engineering practice) height stack for the high pressure coal-fired boilers at the WSC plant and a 65 meter stack for the boilers at the QSC refinery.

Response: The OAQ response to the prior comment must be considered in conjunction with this response in understanding the rationale for Section 8 of 45CSR37. OAQ does not know at this time whether an attainment demonstration can practically be made (using dispersion modeling) for the Weirton area even if the stack height requirements and emission standards of 45CSR37 are implemented. Dispersion modeling results have indicated the need for taller stacks (not to exceed GEP levels) for QSC's boilers, to effect modeled attainment of the NAAQS, and at the WSC coal-fired boilers to mitigate the real and immediate effect of SO_2 emissions impacts within the Ohio River valley. WSC's use of scrubbers to control particulate matter emissions from the company's large coal-fired boilers, in conjunction with relatively low stack heights, exacerbates the ambient SO_2 problems resulting from the currently high short-term SO_2 emission rates. Low stack heights, low gas temperatures, and heavy, wet scrubber plumes from WSC's boilers are predicted by models and observed to result in poor air pollution dispersion. It should be noted that proposed 45CSR37 allows either WSC or QSC to be relieved from the requirement to modify their stacks if either company can demonstrate attainment with the ambient air quality standards using an alternate emission control strategy than that required in 45CSR37.

5. Both WSC and QSC objected to the compliance monitoring recordkeeping and reporting requirement of the proposed rule and believes that the use of the term "continuous emission monitoring" in the rule is vague.

Response: OAQ does not believe the rule to be vague in the use of the term "continuous emission monitoring" (CEM) since that is a common regulatory term, the rule clearly states what parameters are to be continuously monitored, and the rule references equipment design and performance criteria and specification established by USEPA in 40CFR Part 60. Furthermore, OAQ believes that potential and actual SO_2 emission levels from most of the WSC and QSC units for which CEM is required by the rule are sufficiently high and variable enough to warrant CEM requirements. Although QSC argues that the requirement for installing, operating and maintaining CEM equipment at the Congo refinery is unreasonable, it should be noted that most of the CEM equipment required by the proposed rule at the Congo facility is already required under the terms of orders and permits issued by the OAQ quite some time

ago. Such equipment has already been purchased, installed, and is now required to be operated with respect to SO_2 emission standards for boilers No. 1 and 2 and the refinery fuel gas system. The proposed rule would expand the CEM requirement only to boilers A and B.

The severity of the Weirton air quality problem and the size and SO_2 emission potential of sources emitting SO_2 at WSC make the argument for CEM equipment considerably stronger for WSC than QSC. Moreover, USEPA requirements for the approval of state sulfur dioxide emission rules generally mandates that compliance monitoring provisions entail systems for verifying continuous compliance. This is particularly important for SO_2 since the NAAQS averaging time is as short as three hours and since the typically high and variable SO_2 emission rates can result in very high short-term concentrations of SO_2 in the ambient air. USEPA has very favorably commented on the CEM requirements of the proposed rule.

Notwithstanding these considerations, OAQ believes that it is reasonable to accept monitoring of the fuel usage and fuel sulfur content in lieu of continuous monitoring for fuel burning units firing only fuel oil or fuel oil and gas mixtures. A provision has, therefore, been added to the proposed rule to allow such fuel monitoring.

With respect to WSC and QSC comments concerning records retention and certification, OAQ responds that the 5-year retention time is consistent with the monitoring data requirements of 45CSR30 (now in effect) which will implement Title V permit provisions of the Clean Air Act and also believes that all significant reports required to be submitted by a regulated company under 45CSR30 and the proposed rule must be properly certified.

6. Both WSC and QSC objected to the form of the proposed emission standards for boilers and other fuel burning units. Both companies want the emissions standards to be expressed as a pounds per hour cap rather than a pounds per million Btu of heat input performance standard.

Response: Although OAQ believes there may be some merit to WSC and QSC arguments on this point with respect to the ease of measurement of emissions and the connection to ambient analyses, OAQ did not change the rule for the following reasons:

(a) The proposed standards are identical to the form of fuel burning unit standards established by USEPA and many states during the last twenty years.

(b) Emissions standards based upon operating rates are more performance oriented and compensate to a large degree for the adverse pollutant dispersion conditions associated with lower facility operating rates. Lower operating rates means lower air/gas flow rates through the stack and less mechanical boost to the stack plume.

(c) Monitoring data reduction methodology and calculations are well established in similar federal regulations (incorporated by reference into 45CSR37) using the proposed type of emission standards.

7. Quaker State Corporation states in its comments that there is no basis for and no underlying technical justification for the emission limitation in the proposed rule.

This comment is very puzzling with respect to the emission limitation established for fuel gas firing and boiler Nos. 1 and 2. Boilers No. 1 and 2 are subject to a LAER (Lowest Achievable Emission Rate) standard established under a required NSR (45CSR19) permit issued by OAQ twelve years ago. The 50 grains hydrogen sulfide per 100 cubic feet of refinery fuel gas concentration standard in existing 45CSR10 was established to meet basic RACT requirements of EPA more than 20 years ago. The proposed rule, therefore, imposes no new requirements for these units. OAQ believes that most of the other emission limits for QSC sources contained in the proposed rule are standards which the company agreed that it could meet in discussion of the terms of a consent agreement. OAQ has, however, changed the proposed rule requirements relative to the flaring of sour gas in line with the company's comments.

8. WSC and QSC objects to the definition of "modification" in the proposed rule stating that they do not believe there is a technical or modeling basis for the proposed deminimis emission level triggering permit review.

Response: OAQ responds that the definition of modification in the proposed rule conforms to the definition contained in current permitting rules 45CSR13 and 45CSR30 and is appropriate.

9. Starvaggi Industries commented that the enactment and implementation of the proposed rule would have a catastrophic effect upon Starvaggi and, perhaps, Weirton Steel Corporation.

Response: OAQ is cognizant of and sensitive to the possible effects of any mandated new SO_2 regulatory requirements or related consent order provisions upon Starvaggi Industries and, perhaps, other high sulfur coal suppliers. Such considerations have largely been involved in the long delay in addressing the Weirton SO_2 problem. OAQ can only respond that the proposed rule does not mandate a single solution of prohibiting local coal from being used since SO_2 scrubbers or similar technology could feasibly be utilized by WSC.

10. WVMA contests the use of Title V (45CSR30) operating permit fees in implementing the program rule, and thereby questions the fiscal note.

Response: OAQ responds that both the Quaker State/Congo Refinery and Weirton Steel plant are major stationary sources which will be required to be regulated under the Title V permit program. OAQ believes that such fees are primarily intended to be directed to the regulation of facilities such as these through the Title V program.

11. A WVMA comment was received to the effect that incorporating the section containing the determination of stringency in relation to federal counterpart regulations in the rule [Section 1.6] is inappropriate. The comment notes that W.Va. Code §22-1-3a requires the Director of the Division of Environmental Protection to provide a written statement in circumstances in which the Director determines that the rule will be more stringent or less stringent than their federal counterpart. OAQ responds that no reason exists to not include the determination and that as a matter of Division of Environmental Protection policy, that the specific "Determination of Stringency" section be included in each rule proposed by the individual Offices within the Division. OAQ responds that the section as stated is satisfactory, however, OAQ has added a severability clause to the regulation as new section 11.

12. A WVMA comment noted that incorporating the "Constitutional Takings Determination" section in the rule [Section 1.7] is inappropriate. The comment notes that W.Va. Code §22-1A-3(c)(2) expressly exempts the assessment in situations in which the state rulemaking is required pursuant to an applicable federal rule. The comment does not believe the Legislature intended for the determination to be part of the rule itself, thus becoming a law if the rule is authorized. The comment notes that an explanation of the takings determination simply be included as part of the rule filing. OAQ does not disagree with the comment, but notes that no specific reason exists to exclude the determination, and that as a matter of Division of Environmental Protection policy, that the specific "Constitutional Takings Determination" section be included in each rule proposed by the individual Offices within the Division. OAQ responds that the section as stated is satisfactory.

13. WSC and QSC commented that the proposed rule should be withdrawn from consideration and that OAQ should conclude consent orders with WSC and QSC to accomplish the intended objective of 45CSR37.

OAQ has been discussing the development of such consent orders with WSC and QSC for some time and has draft orders proposed by both companies under review at this time. Some significant changes in a number of the provisions of the two drafts are believed to be required particularly with respect to compliance monitoring and compliance demonstration. Additional work must also be completed to refine the underlying modeling basis for a necessary emissions control strategy.

To the extent that consent orders with WSC and QSC can be constructed which achieve the objectives stated above, OAQ may proceed with such consent orders in lieu of seeking legislative authorization of the proposed rule. Near-term statutory deadlines and possible Clean Air Act sanctions which may be imposed by EPA upon West Virginia for failure to address the Hancock County SO_2 problem, however, must be given primary consideration in this matter.

Other Corrections by OAQ to the Proposed Rule

1. In subsection 3.2 the reference to "opacity observations" was deleted since this is not relevant to an SO_2 emission regulation.

2. All references to the "Quaker State Refining Corporation" in the proposed rule were changed to "Quaker State Corporation."

3. In subsections 8.1, 8.2, and 8.3 minor revisions to the references to company "assigns or successors" were made for structural consistency.

4. In subsection 4.2.c, the stated emissions standards of "50 grains of hydrogen sulfide per dry standard cubic feet" is corrected to read "50 grains of hydrogen sulfide per one hundred (100) dry standard cubic feet".