

WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

Form #3

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OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

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

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

CITE AUTHORITY W. Va. Code §§22-5-1 et seq. & §§22-18-1 et seq.

AMENDMENT TO AN EXISTING RULE: YES X NO

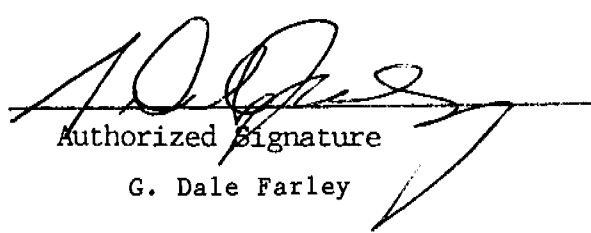
IF YES, SERIES NUMBER OF RULE BEING AMENDED: 45CSR25

TITLE OF RULE BEING AMENDED: "To Prevent and Control Air Pollution
from Hazardous Waste Treatment, Storage, or Disposal Facilities"

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED:

TITLE OF RULE BEING PROPOSED:

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.


Authorized Signature

G. Dale Farley

35.00



BUREAU OF ENVIRONMENT

10 McJunkin Road
Nitro, WV 25143-2506

GASTON CAPERTON
GOVERNOR

LAIDLEY ELI MCCOY, PH.D.
COMMISSIONER

August 26, 1996

Ms. Judy Cooper
Director, Administrative Law Division
Office of the Secretary of State
Capitol Complex
Charleston, West Virginia 25305

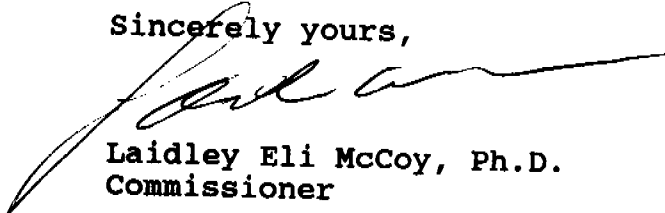
RE: 45CSR25 - "To Prevent and Control Air Pollution
From Hazardous Waste Treatment, Storage,
or Disposal Facilities"

Dear Ms. Cooper:

This is to advise you that I am giving approval for filing with your office the above-referenced rule as an Agency-Approved Rule and submission to the Legislative Rule-Making Review Committee.

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

Sincerely yours,



Laidley Eli McCoy, Ph.D.
Commissioner

LEM:cc

Attachment

DATE: August 29, 1996
TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE
FROM: G. DALE FARLEY
CHIEF, OFFICE OF AIR QUALITY
DIVISION OF ENVIRONMENTAL PROTECTION

LEGISLATIVE RULE TITLE: Series 25 - "To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities"

1. Authorizing statute(s) citation W. Va. Code §§22-5-1 et seq. & §§22-18-1 et seq.
2.
 - a. Date filed in State Register with Notice of Hearing:
July 10, 1996
 - b. What other notice, including advertising, did you give of the hearing?
Class I legal advertisement filed in the Charleston Daily Mail and the Charleston Gazette. The Dominion Post and the Wheeling News Register & Intelligencer. An extensive mailing was also sent out to the DEP and OAQ mailing lists.
 - c. Date of hearing(s): August 13, 1996
 - 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 29, 1996

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

G. Dale Farley, Chief

Office of Air Quality

Phone: 558-2275

3. If the statute under which you promulgated the submitted rules requires certain findings and determinations to be made as a condition precedent to their promulgation:

- a. Give the date upon which you filed in the State Register a notice of the time and place of a hearing for the taking of evidence and a general description of the issues to be decided.

N/A

- b. Date of hearing: N/A

- c. On what date did you file in the State Register the findings and determinations required together with the reasons therefor?

N/A

- d. Attach findings and determinations and reasons:

Attached N/A

**BUREAU OF ENVIRONMENT
DIVISION OF ENVIRONMENTAL PROTECTION**

BRIEFING DOCUMENT

Rule Title: 45CSR25 - "To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities"

A. AUTHORITY: W.Va. Code §§22-5-1 et seq. and §§22-18-1 et seq.

B. SUMMARY OF RULE:

The current version of 45 CSR 25 establishes a program of regulation over the treatment, storage, and disposal of hazardous wastes in order to achieve and maintain such levels of air quality as will protect the public health and safety and the environment from the effects of improper, inadequate, or unsound treatment, storage, or disposal of hazardous wastes.

C. STATEMENT OF CIRCUMSTANCES WHICH REQUIRE RULE:

The proposed rule changes are required to incorporate new regulations issued by the U.S. Environmental Protection Agency regarding Expanded Public Participation under the Resource Conservation and Recovery Act (RCRA). The proposed rule changes will improve the process for permitting facilities that store, treat, or dispose of hazardous wastes by providing earlier opportunities for public involvement in the process and by expanding public access to information throughout the permitting process and the operational lives of the facilities.

D. FEDERAL COUNTERPART REGULATIONS - INCORPORATION BY REFERENCE/DETERMINATION OF STRINGENCY:

A federal counterpart to this proposed rule exists. In accordance with the Director's recommendation, and with limited exception, the Office of Air Quality proposes that the rule incorporate by reference the federal counterparts.

Because the proposed rule incorporates by reference the federal counterpart, no determination of stringency is required.

E. CONSTITUTIONAL TAKINGS DETERMINATION:

The Director has determined that this rule will not result in taking of private property within the meaning of the Constitutions of West Virginia and the United States of America. The Director further finds that this rule is consistent with the requirements of chapter 22 article 1A of the W.Va. Code.

**F. CONSULTATION WITH THE ENVIRONMENTAL PROTECTION
ADVISORY COUNCIL:**

At their July 17, 1996 meeting, the Environmental Protection Advisory Council (the "Council") made no comments on this rule. (See attached minutes of the July 17, 1996 Council meeting).

MINUTES

DEP ADVISORY COUNCIL

July 17, 1996

The special meeting of the DEP Advisory Council was held July 17, 1996, at DEP's headquarters in Nitro, West Virginia. The meeting was called to order at 1:00 p.m. by Chairman Eli McCoy.

ATTENDING - Advisory Council:

Eli McCoy (Chairman)	William Raney
William Samples	Larry Harris
Rick Roberts	Jacqueline Hallinan

DEP:

Mark Scott	Jerry Ray
Dick Cooke	Mike Dorsey
Ken Ellison	Dale Farley
Britt Ludwig	Wendy Radcliff
Ken Politan	Charlie Sturey
Ken Ward	

Eli McCoy began the meeting by welcoming the Council members to the Nitro Office for a special meeting that was scheduled to discuss the proposed amendments to DEP's 1997 rules. Mark Scott said that in accordance with WV Code §22-1-3(c), which requires the Director of the Division of Environmental Protection to consult with the Advisory Council prior to proposing any new rule and that Council's recommendations will be recorded and made part of the rule package when it is filed with Legislative Rule-Making and the Secretary of State's Office the end of August.

Mark briefly reviewed the proposed rules provided to the Council. He noted that an amendment to an existing Environmental Quality Board rule was filed recently regarding water quality standards. Since this is a Board rule, and only requires the approval of the Director for filing, it is not part of the DEP rule package the Council has before them. He stated that a copy will be made available to them if they would like to review it.

47CSR35 - "Hazardous Waste Management Rule"

Mike Dorsey, Office of Waste Management, gave the Council a brief explanation of the Hazardous Waste Management Rule. He

explained that all the proposed amendments, excluding one sentence, were made to adopt the federal hazardous waste regulations by reference.

Bill Samples asked Mike whether someone complying with the federal rule would also be in compliance with the state requirements.

Mike replied that if you are complying with the federal rules, you are also considered in compliance with the state rule.

No specific comments on the rule were made by the Council.

46CSR32 - "Underground Storage Tank Insurance Trust Fund"

Ken Ellison, Office of Waste Management, gave a brief summary of the changes that are being proposed for the Underground Storage Tank Insurance Fund. General discussion was held concerning changes in the UST rule, but no specific comments were made by the Council.

Proposed Brownfields Legislation

Ken Ellison also explained the proposed Brownfields Legislation.

Bill Samples asked if remediation standards are being developed.

Ken answered yes, they are in the process, but they are very preliminary at this point.

Bill Raney asked if the Brownfields rule will supersede other existing federal or state requirements.

Ken said no - all other environmental rules have to be adhered to.

Bill Samples asked about the time frame on the proposed rule package.

Ken stated that the rule-drafting committee, which is totally voluntary, has set a date of September to try to get the first draft out. The law states that the agency only has to propose the rule within a year of the effective date of the law.

Bill Samples said he believes it is important to get this in place and implemented as soon as possible.

Larry Harris asked if the rule-drafting committee seems to be working toward a consensus.

Ken stated that the Governor had requested Dr. Mary Wimmer, Professor of Biochemistry at WVU, and Dr. Paul Hill, Chief Executive Officer of the National Institute for Chemical Studies, to co-chair the rule-making committee, and he feels they are the real strength to achieving a consensus. He believes that the participants are taking this task seriously and trying very hard to reach a consensus.

Jackie Hallinan asked Ken what appears to be the most contentious issue.

Ken replied that the most contentious issues are risk assessment and risk management. There still needs to be a consensus on a range of scientific and technical parameters to use in risk assessment, and there is a different degree of certainty as to what the results will be depending on which parameters are selected. Risk management decisions have to be made within a framework that recognizes that the risk assessor may not be able to quantify the risk for many constituents. At that point, the risk management decision becomes more of a combination of analysis and deliberation of all the interested and affected parties' issues.

Since these rules are still in draft form, no specific comments were made by the Council.

47CSR38 - "Solid Waste Management Rule"

Dick Cooke, Office of Waste Management, briefly described the changes proposed in the Solid Waste Management rule. To receive EPA approval, one sentence in the state code pertaining to the \$8,000 per acre cap on bonding needs to be removed.

Bill Samples asked if EPA has a limit set per acre. Dick said that EPA does not have a limit.

Bill Samples said that as far as the code change DEP is simply eliminating the \$8,000 cap without substituting and not imposing any restriction on bonding. Dick replied that is correct.

38CSR2 - "Surface Mining & Reclamation Rules"

Charlie Sturey, Office of Mining & Reclamation, explained the changes in the Surface Mining and Reclamation Rule. He also stated that all changes in the rule have a corresponding code change.

The main concerns in the surface mining rule were as follows:

11.6 - Site Specific Bonding - Removal of the \$5,000 cap: Bill Raney asked the basis for removing the cap. Director McCoy stated that removal of the \$5,000 cap was at the insistence of OSM. OSM believes that the cap when set at \$5,000 would be insufficient to reclaim some areas, i.e., coal preparation areas or sites we have bonded at higher costs.

14.11 - Procedures to Obtain Inactive Status - Bill Raney said he has concerns regarding the 10-year cap on inactive status for prep plants or load-out facilities; especially for the larger facilities that maintain good security.

Eli stated that prior to 1988 there was a problem with reclamation of inactive sites, and regulations were promulgated to take care of the problem. He said it doesn't seem to be a big problem now. He also stated that inactive status can be renewed and regardless of what the agency's action may be, the decision can be appealed before the Surface Mine Board, and they can overrule any agency decision if they believe otherwise.

Eli asked Bill Raney if, from industry's point of view, he would like to see those numbers removed and propose some idea to allow the inactive status to be extended longer.

Bill Raney stated that longer is not necessarily the concern; going into active and back into inactive is, but feels this is not the time to work out the details.

Larry Harris asked if we have a list of those inactive sites. Eli said DEP does have a database list of over 200 inactive sites.

After Section 14.15 "Contemporaneous Reclamation Standards" of the surface mining rule was explained, Bill Raney stated he would like to go on record stating that this requirement in the state rule is in excess of all federal requirements.

Larry Harris asked if there is a tax or fee charged on the basis of disturbed acres. Charlie Sturey replied that the bond is not released.

A discussion was then held on Section 28 of the Code as it relates to special authorization for reclamation of existing abandoned coal on 5 acres or less if they are doing a certain type of project.

The main concern with this proposed change was the removal is limited to 5 acres. Rick Roberts asked what happens if you

have a 40-acre development site and 20 acres of coal needs to be removed. Director McCoy stated he did not realize there is a 5-acre limit in the rule. He said DEP needs to look into that and weigh the pros and cons of limiting the removal to 5 acres.

47CSR30 - "WV/NPDES Regulations for Coal Mining Facilities"

Ken Politan, Office of Mining and Reclamation, explained the changes in the NPDES Regulation for Coal Mining Facilities. There was general discussion among the Council members but no specific comments concerning the changes.

47CSR11A - "Wasteloads"

Jerry Ray, Office of Water Resources, gave a brief review of the proposed new wasteload rule and explained the reason for the new rule. He said the Office of Water Resources had originally planned to file it as an Interpretative rule, but after review by the Secretary of State's Office, it will be filed as a Legislative rule.

Rick Roberts expressed his concern with limiting the wasteload allocation to 12 months. He believes that with limitations on funding to construct wastewater treatment facilities, or the time it takes to obtain other permits, the time frame should be extended and asked if there is a waiver to extend the permit in certain circumstances. Jerry Ray answered no, there is no waiver.

Director McCoy stated that the problem with wasteload allocations has only existed in the last 5 years. In the past, anyone could obtain a wasteload allocation and continue to get it renewed for an undetermined amount of time. There is a potential for someone to get a wasteload allocation, never use it, and then sell their property and believe they are selling a wasteload allocation with it to get greater value from the property.

38CSR10 - "Environmental Advocate"

Wendy Radcliff, DEP's Environmental Advocate, explained to the Council the circumstances behind refiling the Advocate rule. When the office was created in 1994, DEP was asked to promulgate rules setting forth the duties of the advocate office. DEP filed those rules as Interpretive rules with approval from the Secretary of State's office. A legislative performance audit of the Advocate office was conducted in April of this year. One of the recommendations was to refile the rules as legislative rules. These are identical to the interpretive rules filed in 1994.

There were no comments from the Council members.

45CSR1 - "Confidential Information"; 45CSR25 - "To Prevent and Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities"; "45CSR34 - Emission Standards for Hazardous Air Pollutants Pursuant to 40CFR Part 63"; and 45CSR16 - "Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60"

Dale Farley, Chief of the Office of Air Quality said that three of these rules (45CSR25, 45CSR34, and 45CSR16) are incorporating by reference federal requirements that are necessary to keep the program up to date under Title 5. He then went on to explain the federal requirements to the Advisory Council.

There were no substantive comments from the Council members on these three DEP rules.

Dale briefed the Council members on the fourth DEP rule - "Confidential Information". Compared to the other sections in DEP, Air Quality seems to deal more with confidential information than any other. He said the most significant change in the rule would allow DEP to move away from the situation of inspecting the files, identifying all the documents, and then reviewing them again to determine if the files are confidential.

Jackie Hallinan said she had read the proposed rule and believes it is a step in the right direction to hopefully improve the FOIA process when information requested is contained in files that also house confidential information.

After the discussion of the Air Quality rules, Mark Scott reminded the Council members that they could also submit written comments on any of the proposed rules until the close of the public hearing for that particular rule. He told the Council that DEP will mail them a list of the public hearings that will include the date, time, and location.

Director McCoy then adjourned the meeting at approximately 4:00 p.m.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: 45CSR25 - To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities

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: The above estimates reflect that there will be no anticipated changes in costs to administer this rule.
3. Objectives of these rules: Amendment of this rule is sought to adopt by reference new or revised federal rules. The proposed rule change includes updates to sections of the Code of Federal Regulations relating to Expanded Public Participation. The proposed rule change will improve the process for permitting facilities that store, treat, or dispose of hazardous wastes by providing earlier opportunities for public involvement in the process and by expanding public access to information throughout the permitting process and the operational lives of such facilities.

Rule Title: 45 CSR 25 - "To Prevent and Control Air Pollution from
Hazardous Waste Treatment, Storage, or Disposal Facilities"

4. Explanation of Overall Economic Impact of Proposed Rule.

A. Economic Impact on State Government.

Please see section 2.

B. Economic Impact on Political Subdivisions; Specific Industries; Specific groups of Citizens.

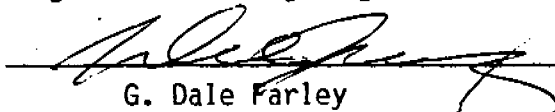
No impact above that resulting from the currently applicable federal requirements.

C. Economic Impact on Citizens/Public at Large.

No impact above that resulting from the currently applicable federal requirements.

Date: July 7, 1976

Signature of Agency Head or Authorized Representative



G. Dale Farley
Chief, Office of Air Quality

FILED

AUG 29 3 57 PM '96

45CSR25

TITLE 45
LEGISLATIVE RULE
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY

OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

SERIES 25

TO PREVENT AND CONTROL AIR POLLUTION FROM HAZARDOUS WASTE
TREATMENT, STORAGE, OR DISPOSAL FACILITIES

§45-25-1. General.

1.1. Scope.

1.1.a. The intent and purpose of this rule is to establish a program of regulation over air emissions from the treatment, storage and disposal of hazardous wastes in order to achieve and maintain such levels of air quality as will protect the public health and safety and the environment from the effects of improper, inadequate, or unsound treatment, storage, or disposal of hazardous wastes. Further, all persons engaged in the treatment, storage, or disposal of hazardous waste shall give careful consideration to the effects of the resultant emissions on the air quality or the areas affected by such any hazardous waste or constituent thereof in such quantities as to cause ambient air concentrations which may be injurious to human health or welfare which would interfere with the enjoyment of life or property.

1.1.b. The requirements of this rule apply to all owners and operators of hazardous waste treatment, storage, and disposal facilities, including but not limited to:

b.1.A- Generators accumulating hazardous waste on-site for periods of less than ninety (90) days;

b.2.B- Owners and operators of wastewater treatment units as defined in this rule; and

b.3.C- Owners and operators which burn hazardous wastes in incinerators, boilers and industrial furnaces in order to destroy the wastes.

1.1.c. Neither compliance with the provisions of this rule nor the absence of specific language to cover particular situations constitutes approval or implies consent or condonement of any emission which is released in any locality in such manner or amount as to cause or contribute to statutory air pollution. Neither does it exempt nor excuse anyone from complying with other applicable laws, ordinances, regulations, or orders of governmental entities

having jurisdiction over hazardous waste treatment, storage or disposal facilities.

1.1.d. This rule is promulgated pursuant to W.Va. Code §§22-18-1 et seq., and §§22-5-1 et seq. Recognizing that each Chapter has its own enforcement sections, it is the intent of the Director that enforcement shall be implemented in accordance with W. Va. Code §§22-18-1 et seq., where practicable.

1.1.e. Permit applications filed pursuant to this rule shall be processed in accordance with the permitting procedures as set forth in W. Va. Code §§22-18-1 et seq., and this rule.

1.2. Authority. -- W.Va. Code §§22-5-1 et seq. and §§22-18-1 et seq.

1.3. Filing Date. --~~April 25, 1996~~

1.4. Effective Date. --~~May 1, 1996~~

1.5. Incorporation By Reference.

1.5.a. This rule incorporates by reference the provisions contained in the Code of Federal Regulations as listed in Table 25-A. 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 ~~June 1, 1995~~ June 15, 1996.

1.5.b. This rule also incorporates by reference the provisions contained in 47 CSR 35, effective June 1, ~~1995~~ 1996.

§45-25-2. Definitions.

2.1. "Air Pollutants" means solids, liquids, or gases which, if discharged into the air, may result in statutory air pollution.

2.2. "Air Pollution", 'statutory air pollution' ~~shall have~~ has the meaning ascribed to it in W. Va. Code §22-5-2.

2.3. "Air Pollution Control Equipment" means any equipment used for collecting or converting hazardous waste emissions for the purpose of preventing or reducing emissions of these materials into the open air from hazardous waste treatment, storage, or disposal facilities.

2.4. "BACT", 'Best Available Control Technology' means an emissions limitation based on the maximum degree of reduction for each pollutant which would be emitted from any hazardous waste treatment, storage or disposal facility which the Director, on a case-by-case basis, taking into account energy, environmental and economic impacts and other costs, determines is achievable for such

facility through application of production processes or available methods, systems, or techniques. If the Director determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results.

2.5. "CAA" means the federal Clean Air Act, as amended; 42 U.S.C. §7401 et seq.

2.6. "CFR" means the Code of Federal Regulations published by the Office of the Federal Register, National Archives and Records Service, General Services Administration.

~~2.7. "Chief" means the Chief of the West Virginia Office of Air Quality, Division of Environmental Protection.~~

2.87. "CWA" means the Clean Water Act (formerly referred to as the Federal Water Pollution Control Act), Public Law 92-500, as amended by Public Law 95-217 and Public Law 95-576; 33 U.S. C. §1251 et seq.

2.98. "Director" means the Director of the West Virginia Division of Environmental Protection or ~~his or her designated representative~~ such other person to whom the Director has delegated authority or duties pursuant to W. Va. Code §22-1-6 or §22-1-8.

~~2.109.~~ "Division of Environmental Protection" or "DEP" means that Division of the West Virginia Division of Environmental Protection which is created by the provisions of W. Va. Code §§22-1-1 et seq.

~~2.110.~~ "EPA" means the United States Environmental Protection Agency.

2.11. "Facility mailing list" means the mailing list for a facility maintained by EPA in accordance with 40 CFR 124.10(c)(1)(ix).

2.12. "Infectious Medical Waste" shall have the meaning ascribed to it in 64 CSR 56 "Infectious Medical Waste", (June 11, 1993), promulgated by the Division of Health.

2.13. "Particulate Matter" means any material, except uncombined water, that exists in a finely divided form as a liquid or solid.

2.14. "Pathological Waste Incinerator" means an incinerator used to thermally treat infectious medical waste.

2.15. "RCRA" means the federal Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act, as amended; 42 U.S.C. §6901 et seq.

2.16. "Steady State" means that all conditions at all points in the thermal treatment process are in stable, normal operating conditions.

~~2.17.~~ All other words or phrases not herein defined and used in this rule shall have the meaning as ascribed in W. Va. Code §§22-5-1 et seq., or W. Va. Code §§22-18-1 et seq., or 47 CSR 35 "Hazardous Waste Management Regulations" governing the State Hazardous Waste Management Act.

§45-25-3. Adoption By Reference.

3.1. Definitions, lists, tables, appendices, conditions, or requirements from 47 CSR 35 "Hazardous Waste Management Regulations", effective June 1, 1995 6 are hereby adopted by reference.

3.1.a. In case of a conflict between the Office of Air Quality and the Office of Waste Management as to whether a material is a waste and if so, whether the material is a hazardous waste, the Director has final administrative authority to resolve the conflict.

3.2. The provisions contained in the Code of Federal Regulations (~~June 1, 1995~~ June 15, 1996), as listed in Table 25-A, are hereby adopted by reference, with the following modifications:

3.2.a. Whenever the term "United States" is used it shall also mean the State of West Virginia.

3.2.b. Whenever the terms "Administrator" or "Regional Administrator", "The Assistant Administrator for Solid Waste and Emergency Response" or "Director" is used, the term means the Director of the West Virginia Division of Environmental Protection.

3.2.c. Whenever the term "Environmental Protection Agency" is used in 40 CFR 266, the term also means the West Virginia Division of Environmental Protection.

3.2.d. The distance provisions of 40 CFR 265.382 apply only to the open burning or open detonation of military explosives in a manner that presents an uncontrolled fragment release hazard. The applicable distance provisions of the American Table of Distances for Commercial Explosives, effective June 19, 1991, and of the Department of Defense Contractors Safety Manual for Ammunition and

Explosives (DOD 4145.26-M), as amended April 11, 1988, apply otherwise.

§45-25-4. Facility Requirements.

4.1. Owners and operators of hazardous waste treatment, storage, and disposal facilities regulated by the provisions of this rule shall maintain a listing of all permits or construction approvals received or applied for under any of the following programs and their counterpart programs administered by the State, where appropriate:

4.1.a. Hazardous Waste Management Program under RCRA and 47 CSR 35;

4.1.b. Prevention of Significant Deterioration (PSD) Program under 45 CSR 14 or the Federal Clean Air Act;

4.1.c. Nonattainment program under West Virginia DEP, Office of Air Quality or the Federal Clean Air Act and 45 CSR 19;

4.1.d. National Emission Standards for Hazardous Pollutants (NESHAP) preconstruction approval under 45 CSR 15 or the Federal Clean Air Act;

4.1.e. Standards of Performance for New Stationary Sources under 45 CSR 16 or the Federal Clean Air Act; and

4.1.f. Other relevant air pollution control permits including local permits.

4.2. Owners and operators of hazardous waste treatment, storage and disposal facilities covered under this rule shall comply with the personnel training requirements as specified by 40 CFR 264.16. An outline of the training program and a description of how the training program is designed to meet actual job tasks must be submitted to the Director with Part B of the permit application.

4.3. Owners and operators of hazardous waste tanks, containers, surface impoundments, landfills, waste piles, land treatment, miscellaneous units, thermal treatment units, incinerators, and boiler and industrial furnace facilities must design, construct, maintain, and operate such facilities to minimize the possibility of a fire, explosion, or any unplanned, sudden, or non-sudden release of hazardous waste constituents to the air which could threaten human health or the environment.

4.4. Owners and operators of hazardous waste management facilities that treat, store, or dispose of ignitable or reactive wastes, or mix incompatible waste or incompatible wastes and other materials, must prevent reactions which:

4.4.a. Produce uncontrolled toxic mists, fumes, dust or gases in sufficient quantities to threaten human health or the environment, and

4.4.b. Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosion.

4.5. The owners and operators of the hazardous waste treatment, storage and disposal facilities shall manage all hazardous waste placed in a container in accordance with the applicable air emission standard requirements of 40 CFR 264 and 265 including but not limited to subpart CC.

4.6. The owners and operators of the hazardous waste treatment, storage and disposal facilities shall manage all hazardous waste placed in a tank in accordance with the applicable air emission standard requirements of 40 CFR 264 and 265 including but not limited to subparts AA, BB and CC.

4.7. The owners and operators of the hazardous waste treatment, storage and disposal facilities shall manage all hazardous waste placed in a surface impoundment in accordance with the applicable air emission standard requirements of 40 CFR 264 and 265 including but not limited to subpart CC.

4.8. The owners and operators of the hazardous waste treatment, storage and disposal facilities shall manage all hazardous waste placed in a miscellaneous unit in accordance with the applicable air pollution standard requirements of 40 CFR 264 including but not limited to subparts AA, BB, and CC.

4.9. A hazardous waste pile must be fully enclosed or otherwise designed to prevent dispersal of the waste by wind.

4.10. Hazardous waste landfills must be covered or otherwise managed to prevent wind dispersal of the waste.

4.11. All landfills, surface impoundments, and land treatment facilities shall be located, designed, constructed, operated, maintained, and closed in a manner that will assure protection of human health and the environment. Protection of human health and the environment shall include prevention of adverse effects on air quality considering:

4.11.a. The volume and physical and chemical characteristics of the waste in the facility, including its potential for volatilization and wind dispersal;

4.11.b. The existing quality of the air, including other sources of contamination and their cumulative impact on the air;

4.11.c. The potential for health risks caused by human

exposure to waste constituents;

4.11.d. The potential damage to wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents;

4.11.e. The potential for interference with the enjoyment of life or property; and

4.11.f. The persistence and permanence of such potential adverse effects.

4.12. Owners and operators of hazardous waste treatment, storage, or disposal facilities shall utilize best available control technology ("BACT") to limit the discharge of hazardous waste constituents to the atmosphere during:

4.12.a. Process turn-arounds;

4.12.b. Cleaning of process equipment;

4.12.c. Planned process shutdowns; and

4.12.d. Tank truck, railroad tank car, and barge cleaning.

4.13. ~~a-~~ The Director may, on a case-by-case basis, establish performance standards for hazardous waste incinerators for control of emissions of metals, hydrogen halides, and elemental halogen, based on a finding that such standards are necessary to limit the emission rates of these constituents to levels which do not pose an unacceptable risk to human health and environment. The Director may require the following data from the permit applicant:

4.13.a.A- Emissions of POHCs, hazardous combustion by-products, metals and hydrogen halides, including:

a.1.(a) Mass emission rates from the stack, and

a.2.(b) Concentration in the gas stream exiting the stack;
and

4.13.b.B- Air dispersion estimates for those substances, including:

b.1.(a) Meteorological data, and

b.2.(b) Description of the air dispersion models, and

b.3.(c) Assumptions underlying the air dispersion models used; and

4.13.c.C- Expected human and environmental exposure, including:

- ~~c.1.(a)~~ Topographic considerations,
- ~~c.2.(b)~~ Population distributions,
- ~~c.3.(e)~~ Population activities, and
- ~~c.4.(d)~~ Modes, intensity, and duration of exposure; and

4.13.d.D Consequences of exposure, including:

- ~~d.1.(a)~~ Dose-response curves for carcinogens,
- ~~d.2.(b)~~ Health effects based on human or animal studies for other toxic constituents,
- ~~d.3.(e)~~ Potential for accumulation of toxic constituents in the human body, and
- ~~d.4.(d)~~ Statements of expected risk to individuals or populations.

4.14. Emergency Permit. Notwithstanding any other provision in 40 CFR 270.61, in the event the Director finds an imminent and substantial danger to human health or the environment, the Director may issue a temporary permit to a facility to allow treatment, storage, or disposal of hazardous waste at a non-permitted facility, or hazardous waste not covered by the permit for a facility with an effective permit. This emergency permit:

4.14.a. May be oral or written. If oral, it shall be followed within five (5) days by written emergency permit;

4.14.b. Shall not exceed ninety (90) days in duration;

4.14.c. Shall clearly specify the hazardous wastes to be received, and the manner and location of the treatment, storage, or disposal;

4.14.d. May be terminated by the Director at any time without prior notice if it is determined that termination is appropriate to protect human health or the environment; and

4.14.e. Shall be accompanied by public notice as described under Section 7 of this rule and shall include the following:

~~e.1.A.~~ Name and address of the office granting the emergency authorization,

~~e.2.B.~~ Name and location of the permitted hazardous waste management facility,

~~e.3.C.~~ A brief description of the wastes involved,

~~e.4.D.~~ A brief description of the action authorized and reasons for authorizing it,

~~e.5.E.~~ Duration of the emergency permit; and

4.14.f. Shall incorporate, to the extent possible and not inconsistent with the emergency situation, all applicable requirements of this rule.

4.15. Pathological Waste Incinerators. The owner and operator of a pathological waste incinerator is not subject to the requirements of this regulation. However, mixtures of infectious medical waste and hazardous waste listed in 40 CFR 261 Subpart D are subject to the requirements of this rule and the owner and operator of such a facility shall design, construct and operate the facility in accordance with all other applicable regulations promulgated by the Director, including, but not limited to, 45 CSR 6 and 45 CSR 13.

\$45-25-5. Exclusion and Exemptions.

5.1. Wastes and/or materials excluded in 47 CSR 35, are also excluded from the requirements of this rule, except that mixtures of domestic or industrial sewage and hazardous wastes which pass through a sewer system to a privately owned or publicly owned treatment works are subject to the requirements of this rule.

5.2. Except for recyclable materials exempt pursuant to Section 3 of 47 CSR 35, hazardous wastes that are stored prior to recycling are subject to all applicable provisions of Section 4 of this rule.

\$45-25-6. Confidential Information.

6.1. Any records, reports, or information and any permit, permit applications, and related documents within the Director's possession shall be available to the public for inspection and copying: provided, however, that upon satisfactory showing to the Director that such records, reports, permit documentation, or information, or any part thereof would, if made public, divulge methods or processes, or activities, entitled to protection as trade secrets, the Director shall consider, treat, and protect such records as confidential pursuant to W. Va. Code §22-18-1 et seq., and §22-5-1 et seq.

\$45-25-7. Public ~~Notice~~Participation.

Public notice of the preparation of a draft permit shall be given by the methods contained in 47 CSR 35 ~~Section 12.~~ In addition, ~~the owner and operator shall place a Class I legal advertisement in a newspaper of general circulation in accordance with applicable provisions of WV CSR §§45-13-6.1., 6.2., and 6.3. Section 11, and 40 CFR 270.2, 270.14, 270.30, 270.62, and 270.66.~~

\$45-25-8. Application Fees.

8.1. Any person who applies for a permit for the construction and/or operation of ~~an air emitting~~ hazardous waste treatment, storage, or disposal facility shall submit as part of said application a money order or cashier's check payable to the ~~"Hazardous Waste Management Fund"~~ "Air Pollution Control Fund" of the State Treasury. Such fee shall be determined by the schedule set forth below:

ACTIVITY FEES

a. Hazardous Waste Management Facilities

Treatment design capacity more than 1,000 ton/yr	\$5,000
--	---------

Treatment design capacity less than 1,000 ton/yr	\$5,000
--	---------

b. Major Modifications or Renewals of Permits for Hazardous Waste Management Facilities \$1,000

All fees required under this section shall be in addition to fees required under any other rule of the West Virginia Division of Environmental Protection.

\$45-25-9. Inconsistency Between Rules.

In the event of any inconsistency between 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 and rule.

45CSR25

TABLE 25-A

Item No.	CFR No.		Part No.		Subpart No.	Title
1.	40 CFR	-	264, 265	-	O	- Incinerator
2.		-	270.19	-	B	- Specific Requirements for Incinerators
3.		-	270.62	-	F	- Hazardous Waste Incinerator Permits
4.	40 CFR	-	264	-	X	- Miscellaneous Units
5.		-	270.23	-	B	- Specific Requirements for Miscellaneous Units
6.	40 CFR	-	264, 265	-	AA	- Air Emission Standards Standards for Process Vents
7.		-	270.24	-	B	- Specific Requirements for Process Vents
8.	40 CFR	-	264, 265	-	BB	- Air Emission Standards for Equipment Leaks
9.		-	270.25	-	B	- Specific Requirements for Equipments Leaks
10.	40 CFR	-	264, 265, 270	-	CC	- Organic Air Emission Standards for Tanks, Surface Impoundments, and Containers
11.	40 CFR	-	265	-	P	- Thermal Treatment
12.	40 CFR	-	266	-	H	- Hazardous Waste Burned in Boilers and Industrial Furnaces

Item No.	CFR No.	Part No.	Subpart No.	Title
13.	-	270.22	- B	- Specific Requirements for Boilers and Industrial Furnaces Burning Hazardous Wastes
14.	-	270.66	- F	- Permits for Boiler and Industrial Furnaces Burning Hazardous Waste
15.	40 CFR	279.23	- C	- On-site Burning In Space Heater
16.	-	279.60 279.61 279.62 279.63	- G	- Standards for Used Oil Burners Who Burn Off-Specification Used Oil for Energy Recovery
<u>17.</u>	-	<u>270.14(b)(22)</u>	- B	- <u>Part B application General Requirements</u>
<u>18.</u>	-	<u>270.30(m)</u>	- B	- <u>Information repository</u>

Instrument Approach Procedures (TERPS). In developing these SIAPs, the TERPS criteria were applied to the conditions existing or anticipated at the affected airports.

The FAA has determined through testing that current non-localizer type, non-precision instrument approaches developed using the TERPS criteria can be flown by aircraft equipped with Global Positioning System (GPS) equipment. In consideration of the above, the applicable Standard Instrument Approach Procedures (SIAPs) will be altered to include "or GPS" in the title without otherwise reviewing or modifying the procedure. (Once a stand alone GPS procedure is developed, the procedure title will be altered to remove "or GPS" from these non-localizer, non-precision instrument approach procedure titles.) Because of the close and immediate relationship between these SIAPs and safety in air commerce, I find that notice and public procedure before adopting these SIAPs are impracticable and contrary to the public interest and, where applicable, that good cause exists for making some SIAPs effective in less than 30 days.

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current. It, therefore—(1) is not a "significant regulatory action" under Executive Order 12866; (2) is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a regulatory evaluation as the anticipated impact is so minimal. For the same reason, the FAA certifies that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 97

Air Traffic Control, Airports, Navigation (Air).

Issued in Washington, DC on December 1, 1995.

Thomas C. Accardi,
Director, Flight Standards Service.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me, part 97 of the Federal Aviation Regulations (14 CFR part 97) is amended by establishing, amending, suspending, or revoking Standard Instrument Approach Procedures, effective at 0901 UTC on the dates specified, as follows:

PART 97—STANDARD INSTRUMENT APPROACH PROCEDURES

1. The authority citation for part 97 is revised to read as follows:

Authority: 49 U.S.C. 106(g), 40103, 40113, 40120, 44701; and 14 CFR 11.49(b)(2).

2. Part 97 is amended to read as follows:

§§ 97.23, 97.27, 97.33, 97.35 [Amended]

By amending: § 97.23 VOR, VOR/DME, VOR or TACAN, and VOR/DME or TACAN; § 97.27 NDB, NDB/DME; § 97.33 RNAV SIAPs; and § 97.35 COPTER SIAPs, identified as follows:

***Effective JAN 04, 1996

Madera, CA Madera Muni, VOR or GPS RWY 30, Amdt 9 CANCELLED

Madera, CA Madera Muni, VOR RWY 30, Amdt 9

Webster City, IA, Webster City Muni, NDB or GPS RWY 32, Amdt 7 CANCELLED

Webster City, IA, Webster City Muni, NDB RWY 32, Amdt 8

Augusta, KS, Augusta Muni, VOR/DME RNAV or GPS RWY 36, Orig-A CANCELLED

Augusta, KS, Augusta Muni, VOR/DME RNAV RWY 36, Orig-A

Olathe, KS, Johnson County Executive, VOR or GPS RWY 35, Amdt 10 CANCELLED

Olathe, KS, Johnson County Executive, VOR RWY 35, Amdt 10

Eastport, ME, Eastport Muni, NDB or GPS RWY 15, Orig CANCELLED

Eastport, ME, Eastport Muni, NDB RWY 15, Orig

Harrisonville, MO, Lawrence Smith Memorial, VOR/DME or GPS RWY 35, Orig CANCELLED

Harrisonville, MO, Lawrence Smith Memorial, VOR/DME RWY 35, Orig

Omaha, NE, Millard, VOR/DME RNAV or GPS RWY 12, Amdt 6 CANCELLED

Omaha, NE, Millard, VOR/DME RNAV RWY 12, Amdt 6

Sidney, NE, Sidney Muni, VOR/DME OR TACAN or GPS RWY 30 Amdt 4 CANCELLED

Sidney, NE, Sidney Muni, VOR/DME OR TACAN RWY 30 Amdt 4

Clinton, OK, Clinton-Sherman, NDB or GPS RWY 17R, Amdt 10 CANCELLED

Clinton, OK, Clinton-Sherman, NDB RWY 17R, Amdt 10

Pauls Valley, OK, Pauls Valley Muni, NDB or GPS RWY 35, Amdt 2 CANCELLED

Pauls Valley, OK, Pauls Valley Muni, NDB RWY 35, Amdt 3

Gainesville, TX, Gainesville Muni, NDB or GPS RWY 17, Amdt 8 CANCELLED

Gainesville, TX, Gainesville Muni, NDB RWY 17, Amdt 8

[FR Doc. 95-30098 Filed 12-8-95; 8:45 am]

BILLING CODE 4910-33-M

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9, 124 and 270

[FRL-5319-4 RIN 2050-AD97]

RCRA Expanded Public Participation

AGENCY: Environmental Protection Agency.

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA) is issuing new regulations under the Resource Conservation and Recovery Act (RCRA). The new regulations will improve the process for permitting facilities that store, treat, or dispose of hazardous wastes by providing earlier opportunities for public involvement in the process and expanding public access to information throughout the permitting process and the operational lives of facilities.

EFFECTIVE DATE: June 11, 1996.

ADDRESSES: Supporting materials are available for viewing in the RCRA Information Center (RIC) located at 1235 Jefferson Davis Highway, Arlington VA. The Docket Identification Number is F-95-PPCF-FFFFF (the docket number for the proposed rule is F-94-PPCP-FFFFF). The RIC is open from 9 a.m. to 4 p.m., Monday through Friday, excluding federal holidays. To review docket materials, the public must make an appointment by calling (703) 603-9230. The public may copy a maximum of 100 pages from any regulatory docket at no charge. Additional copies cost \$15/page. The index and some supporting materials are available electronically. See the SUPPLEMENTARY INFORMATION section for information on accessing them.

FOR FURTHER INFORMATION CONTACT: For general information, contact the RCRA Hotline at 1-800-424-9346 or TDD 1-800-553-7672 (hearing impaired). In the Washington metropolitan area, call 703-412-9810 or TDD 703-412-3323.

For more detailed information on specific aspects of this rulemaking, contact Patricia Buzzell, Office of Solid Waste (5303W), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. (703) 308-8632, email address buzzell.ricia@epamail.epa.gov.

SUPPLEMENTARY INFORMATION:

Internet Access

An abstract and fact sheet on this rule are available on the Internet. Follow these instructions to access the information electronically:

Gopher: gopher.epa.gov
WWW: http://www.epa.gov

Dial-up: (919) 558-0335.

From the main EPA Gopher menu, select: EPA Offices and Regions/Office of Solid Waste and Emergency Response (OSWER)/Office of Solid Waste (RCRA)/Hazardous Waste/Permits and Permitting.

FTP: ftp.epa.gov

Login: anonymous

Password: Your Internet address

Files are located in /pub/gopher/OSWRCRA

Preamble Outline

- I. Statutory Authority
- II. Background
 - A. Overview of the RCRA Permitting Program
 - B. Shortcomings of the Current Program
 - C. How Today's Rule will Improve the Program
 - D. The Rule: From Proposal to Final
- III. Applicability of Today's Rule
- IV. Review of Public Comments, Responses, and Changes from the Proposed Rule
 - A. Equitable Public Participation and Environmental Justice
 - B. Pre-Application Meeting and Notice
 - C. Notice at Application Submittal
 - D. Information Repository
 - E. Trial Burn Notices
- V. State Authority
 - A. Applicability of Today's Rule in Authorized States
 - B. Schedules and Requirements for Authorization
- VI. Permits Improvement Team
- VII. Regulatory Assessment Requirements
 - A. Executive Order 12866
 - B. Regulatory Flexibility Act
 - C. Paperwork Reduction Act
 - D. Unfunded Mandates Reform Act
 - E. Enhancing the Intergovernmental Partnership

I. Statutory Authority

EPA is issuing these regulations under the authority of sections 2002, 3004, 3005 and 7004(b) of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act (RCRA), as amended by the Hazardous and Solid Waste Amendments of 1984 (HSWA).

II. Background

A. Overview of the RCRA Permitting Program

In RCRA, Congress gave EPA the authority to write regulations, or "rules," to govern, among other things, the permitting of hazardous waste management facilities. EPA is issuing today's regulations to enhance public participation in the hazardous waste facility permitting process.

Under RCRA, EPA is responsible for regulating the "cradle to grave" management of hazardous wastes. Hazardous wastes come in many shapes and forms. They may be liquids, solids,

or sludges. They may be the by-products of manufacturing processes, or simply commercial products—such as household cleaning fluids or battery acid—that have been discarded. EPA determines if wastes are hazardous by judging, among other things, the characteristics of the wastes and their potential to cause harm to human health and the environment when not properly managed. RCRA regulations identify hazardous wastes based on their characteristics and also provide a list of specific hazardous wastes (refer to 40 CFR 261 for more information). To manage hazardous waste in an environmentally sound manner, companies often need to store it, treat it (for instance, by burning it or mixing it with stabilizing chemicals), and/or dispose of it into specially built landfills. In most cases, a business that stores, treats, or disposes of hazardous waste, needs a permit under RCRA.

Section 3004 of RCRA requires owners and operators of facilities that treat, store, or dispose of hazardous wastes to comply with standards that are "necessary to protect human health and the environment." EPA or EPA-authorized States implement these standards by issuing RCRA permits to facilities that treat, store, or dispose of hazardous wastes. In some circumstances, existing facilities may continue to operate without a full RCRA permit under the "interim status" provision of RCRA § 3005(e). In RCRA, Congress gave EPA broad authority to provide for public participation in the RCRA permitting process. Section 7004(b) of RCRA requires EPA to provide for, encourage, and assist public participation in the development, revision, implementation, and enforcement of any regulation, guideline, information, or program under the Act.

Under RCRA section 3006, States may seek EPA authorization to administer and enforce the RCRA program in lieu of EPA. Once a State adopts today's rule and receives EPA authorization for the rule, the State will become the primary implementor of the rule (see Section V, below for more information). In today's preamble, we refer to the primary implementing agency for this rule as "the permitting agency" or "the agency." "The Director" refers to the head of the primary implementing agency. We refer to EPA as "EPA" or "the Agency."

B. Shortcomings of the Current Program

Many stakeholders have expressed the concern that the current RCRA permitting process does not involve the public at an early stage in the process.

does not provide adequate information, and does not provide an equitable opportunity to participate. EPA is responding to these concerns in today's rule. In fact, EPA has emphasized the need for more public involvement in all its activities. The Agency's Hazardous Waste Minimization and Combustion Strategy calls for the development of mechanisms to ensure that local communities are fully informed about the RCRA decision-making process and have an opportunity to participate in that process. Recommendations from the National Performance Review, the RCRA Implementation Study, and the Permits Improvement Team have all emphasized the need for expanded public participation in permitting. A number of sources outside the Agency (e.g., environmental groups, and business trade associations) have also supported enhanced public participation.

C. How Today's Rule Will Improve the Program

Today's final rule will require a prospective applicant to hold an informal public meeting before submitting an application for a RCRA permit. Also, the regulations will require the applicant to advertise the meeting in the newspaper, through a broadcast announcement (e.g., by radio or television), and on a sign posted at or near the property. This meeting will provide a chance for the community to interact with and provide input to a facility owner or operator before the owner or operator submits a permit application. The rule also directs the permitting agency to mail a notice to interested people when the facility submits its application. The notice will tell members of the public where they can examine the application at the same time that the agency reviews it.

In some cases, RCRA permits can be the subject of intense debate. When permits raise a lot of public interest, the public's demand for information increases. Today's rule will give the permitting agency the authority to require a facility owner or operator to set up an information repository at any time during the permitting process or the permit life. We anticipate that agencies will use this authority only in those permitting cases that raise a lot of public interest, or in other cases where the public needs more access to information. The repository will hold all information and documents that the permitting agency decides are necessary to fulfill the purposes for which the repository was established. Finally, today's rule will require combustion facilities (i.e., incinerators and other

facilities that burn hazardous wastes) to notify the public before they hold a trial burn.¹

EPA anticipates that these regulations will provide an opportunity for the public to participate earlier in the permitting process. In addition, the rule will give the public increased access to facility and permitting information. Finally, we hope that the rule will help people become involved in the permitting process and increase understanding of hazardous waste management facilities.

D. The Rule: From Proposal to Final

EPA proposed the RCRA Expanded Public Participation and Revisions to Combustion Permitting Procedures rule on June 2, 1994 (59 FR 28680-28711). The proposed rule contained changes and additions to the RCRA public participation regulations (40 CFR 124) and RCRA Subtitle C permitting regulations (40 CFR 270).

Today, EPA is finalizing the public participation portion of the proposal (with a number of changes in response to comments received by the Agency during the comment period for the proposed rule—see Section IV below), which includes changes to both Parts 124 and 270. The Agency is not finalizing the proposed revisions to combustion permitting procedures at this time.

EPA decided to separate the two portions for a number of reasons. First, the public comments on the proposed rule were more favorable towards the public participation changes. On the other hand, the commenters were less satisfied with the proposed combustion permitting changes, particularly those changes regarding the trial burn. The Agency is currently considering and addressing the commenters' concerns on the proposed combustion permitting changes. In the meantime, EPA sees no reason to delay the important changes to the public participation provisions.

Moreover, EPA is committed to issuing comprehensive emissions standards for combustion facilities under RCRA and the Clean Air Act. The Agency anticipates issuing a proposed rule on these standards in the fall of 1995. Due to potential overlap between the procedures in the emissions standards proposed rule and the

combustion permitting procedures in the June 2, 1994 proposed rule, EPA has decided to take more time to consider the permitting provisions in the June 2 proposal. We intend to find the best possible solution to coordinate these two rulemakings.

Finally, EPA realized that the proposed rule may have caused some confusion. A few commenters pointed to the different character of the public participation changes and the combustion permitting changes. The commenters expressed concern over combining these two dissimilar portions in the same rule. Moreover, a number of commenters seemed to be confused over the applicability of the rule. In particular, since the combustion permitting provisions would apply only to combustion facilities, and the proposed rule was an outgrowth of the Combustion Strategy, a number of commenters seemed confused over the applicability of the public participation procedures to all RCRA TSDFs.

III. Applicability of Today's Rule

Today's rule promulgates changes and additions to Parts 124 and 270 in the Code of Federal Regulations (CFR). The Part 124 changes, which include new and earlier public involvement steps and procedures, apply to every facility that has or is seeking a RCRA subtitle C permit to treat, store, or dispose of hazardous waste, unless exempted under a specific section. The changes to Part 270, in §§ 270.2, 270.14, and 270.30, also apply to every facility. The changes to §§ 270.62 and 270.66, however, apply only to combustion facilities.

The rule does not require RCRA facilities that are already involved in the permitting process to step back in the process to comply with the new requirements. Instead, the rule will apply to a facility according to what stage of the process the facility is in when the rule becomes effective. For instance, if a facility has submitted its part B permit application before the effective date of this rule, then the rule does not require the facility to hold a pre-application meeting under § 124.31. This facility would, however, have to comply with all requirements relating to steps in the permitting process that it has not yet undertaken.

IV. Review of Public Comments, Responses, and Changes From the Proposed Rule

The following (IV. A through E) is a section-by-section summary of the most significant comments on the proposed rule, EPA's responses to those comments, and an explanation of any

changes from the proposed rule to the final. All of the public comments and EPA's comprehensive response to comments document on this rulemaking are available through the RCRA Docket (see the paragraph entitled ADDRESSES, above).

The most significant changes in the final rule involve our decision to use guidance, instead of rule language, to encourage facilities to strive toward some of the important goals in the proposed rule. EPA recognized in the proposal that some of the proposed regulatory provisions were very general and requested comment on how they could be effectively implemented (see, e.g., 59 FR 28702). In response, commenters argued that several portions of the proposed regulatory language were vague and would spawn disputes, controversy, and litigation. The commenters suggested that EPA relocate some of the proposed regulatory text to the preamble as guidance.

EPA found these comments persuasive in certain instances. The development of today's rule has, from the start, involved a balance between promoting broader, more equitable public participation while maintaining the flexibility for individual permit writers, facilities, and communities to adopt the most appropriate, site-specific approach consistent with the principles of fairness and openness. Some of the principles underlying the proposed and final rules are inherently difficult to prescribe through regulation. For example, it is possible to require an applicant to hold a meeting; it is much more difficult to require through regulation that the meeting be conducted in an equitable fashion, since the steps required to accomplish this objective will necessarily vary from situation to situation. Although the final rule retains most of the proposed regulatory changes, EPA concluded that, in certain instances, the need to maintain flexibility is inconsistent with a national regulatory approach. In these instances, as explained more fully in the sections below, EPA has decided to proceed by using guidance, rather than regulations, to encourage facilities to adopt and strive towards a number of the goals in the proposed rule. The Agency will provide some guidance in today's preamble; however, we also anticipate releasing a guidance document, in the near future, to help permitting agencies and facilities to implement today's rule.

The Agency believes that facility owners, State environmental agencies, tribes, and private citizens are often in the best position to determine what modes of communication and

¹ The owner or operator of a combustion unit must conduct a trial burn as part of the permitting process for a combustion unit. The trial burn is a demonstration period held by the owner or operator of a combustion unit to test the unit's ability to meet the regulatory performance standards for treatment of hazardous wastes. The permitting agency uses the results of the trial burn to establish operating conditions in the RCRA permit.

participation will work best in their communities. The final rule provides the flexibility necessary to find the best local solutions to ensure equal opportunities for all members of the community.

A. Equitable Public Participation and Environmental Justice

Proposed § 124.30 and Preamble. In section 124.30 of the proposed rule, entitled "Equitable Public Participation," EPA proposed to require facilities and permitting agencies to "make all reasonable efforts" to ensure equal opportunity for the public to participate in the permitting process. The proposed rule language defined "reasonable efforts" as including the use of multilingual fact sheets and interpreters at meetings and hearings, when the "affected community contains a significant non-English speaking population."

In the preamble to the proposed rule (see 59 FR 28686), EPA solicited comments on several key environmental justice issues for the RCRA permitting program: (1) The siting of hazardous waste facilities; (2) the manner in which EPA should respond when confronted with a challenge to a RCRA permit based on environmental justice issues; (3) environmental justice concerns in corrective action cleanups; and (4) how EPA programs can take account of "cumulative risk" and "cumulative effects" associated with the siting of a hazardous waste management facility. The Agency noted that, while it did not expect to address these issues in this rulemaking, public input on these topics would be helpful.

Synopsis of Major Comments on § 124.30 and Preamble. The major comments on this section of the proposal involved definitions. Commenters asked the Agency to define many of the terms in § 124.30, including "all reasonable efforts," "significant," "non-English speaking" and "affected community." The commenters were concerned about the disputes, controversy, and litigation that could arise from these undefined terms. Other commenters supported the concept of equitable public participation, particularly as an approach to addressing any environmental justice concerns that might be present.

The Agency received a number of comments supporting expanded public participation as an effective approach to addressing environmental justice issues. Commenters stated that additional opportunities for public involvement and access to information will increase the probability that all communities will have input into the permitting process,

and should strengthen involvement of those who have felt disenfranchised from the process. Some commenters urged EPA to avoid a one-size-fits-all approach and allow flexibility for State, local, and facility leadership to make suitable determinations about how to address environmental justice issues.

EPA's Response to Commenters. EPA is committed to the principles of equitable public participation and equal treatment of all people under our environmental statutes and regulations. The regulatory changes we are making today will enhance the RCRA public participation process for all citizens. We urge all permitting agencies, permit holders, and applicants, to make all reasonable efforts to provide equal access to information and participation in the RCRA permitting process.

While we continue to promote equitable public participation, we have decided to address the objectives of § 124.30 in guidance rather than through regulatory language. In response to the concerns expressed by many commenters, we are not including § 124.30 in the final rule. The Agency agrees with the commenters who expressed concern that the language in the proposal was ambiguous, making compliance with the requirements difficult to evaluate and enforce, and could engender disputes and litigation without advancing the objectives of today's rulemaking.

As we noted earlier, EPA continues to support the principles embodied in § 124.30 of the proposed rule. We encourage permitting agencies and facilities to follow the spirit of that section and use all reasonable means to ensure that all segments of the population have an equal opportunity to participate in the permitting process and have equal access to information in the process. These means may include, but are not limited to, multilingual notices and fact sheets, as well as translators, in areas where the affected community contains significant numbers of people who do not speak English as a first language.

In lieu of a regulation, the Agency will take additional steps to encourage equitable public participation in RCRA permitting. In the near future, EPA will issue further guidance to assist facilities, permitting agencies, and communities in implementing the expanded public participation requirements in today's rule. In this guidance document, EPA plans to discuss additional options for increasing public participation by going beyond the regulatory requirements. The guidance document will address, in more detail, the approaches to equitable

public participation that we are emphasizing in this preamble.

EPA believes that this rule presents significant opportunities to be responsive to environmental justice concerns in the context of public involvement. Prior to the promulgation of today's rule, the permitting process did not formally involve the public until the permitting agency issued a draft permit or an intent to deny a permit. In many cases, communities around RCRA facilities felt that the draft permit stage was too late to enter the process, that the facility and the permitting agency had already made all the major decisions by that point, and any comments the public offered would have no real effect. Insufficient opportunity for communities to become involved in environmental decision-making is a contributing factor to environmental justice concerns. The provisions in today's rule will address many of these concerns by expanding public participation and access to permitting information.

EPA continues to see public participation as an important activity that empowers communities to become actively involved in local waste management activities. The Agency believes that this rulemaking is an important step in empowering all communities, including communities of color and low-income communities.

EPA agrees with the commenters who stated that the expanded public participation requirements in today's rule will be useful tools for addressing environmental justice concerns. Today's rule provides all communities with a greater voice in decision making and a stronger opportunity to influence permit decisions early in the process. EPA also agrees with the commenters who stated that environmental justice issues should be addressed at a local level and on a site-specific basis. Local agencies and leaders have an important role to play in addressing environmental justice concerns. States and EPA Regional offices are the principal implementors of the RCRA permitting program, and have been directed to develop mechanisms that respond effectively to environmental justice concerns during permitting activities (RCRA Implementation Plan (RIP), 1995). In the RIP, EPA asked RCRA implementing agencies to continue their commitment to seek opportunities to address patterns of disproportionately high and adverse environmental effects and human health impacts on low-income communities and communities of color that may result from hazardous waste management activities. The States and Regions have been involved in

environmental justice pilot projects, which have included, among other activities, increasing public involvement by tailoring outreach activities to affected communities.

EPA and its Office of Solid Waste and Emergency Response (OSWER) also remain committed to addressing environmental justice concerns beyond those related to public participation. The preamble to the proposed rule (see 59 FR 28686) discussed OSWER's environmental justice efforts. Elliott P. Laws, OSWER Assistant Administrator, formed the OSWER Environmental Justice Task Force ("EJ Task Force") to begin addressing many of these issues. EPA released the "OSWER Environmental Justice Task Force Draft Final Report" (OSWER 9200.3-16 Draft) and its separate executive summary (OSWER 9200.3-16-1 Draft) on April 25, 1994. Since that time, the EPA Regional offices and the OSWER program offices have been implementing the recommendations outlined in the EJ Task Force's draft final report. The report was distributed to the National Environmental Justice Advisory Council (NEJAC) for comment. In June 1995, after careful consideration of all comments, EPA released the "OSWER Environmental Justice Action Agenda." The Action Agenda provides a concise summary of OSWER's current strategy and describes the implementation process for ensuring that major issues, identified by the NEJAC and others, continue to be recognized and addressed. A full report on implementation progress and accomplishments, entitled "Waste Programs Environmental Justice Accomplishments Report," was released concurrently with the Action Agenda. All of these documents are "living documents" and, as such, are a part of the process of continuously addressing environmental justice concerns. This process represents OSWER's commitment to adhere to the principles of Executive Order 12898, in which the President directed federal agencies to identify and address the environmental concerns and issues of minority and low-income communities. Furthermore, in an effort to make environmental justice an integral part of the way we do business, the Agency issued a policy directive, in September 1994 (OSWER 9200.3-17), that requires all future OSWER policy and guidance documents to consider environmental justice issues.

During the public comment period on the proposed rule, EPA received a large number of comments on preliminary recommendations that the EJ Task Force had developed regarding several other

(i.e., beyond today's public involvement rule) key environmental justice issues facing the RCRA permitting program. The comments ranged from general observations to more detailed suggestions, particularly with regard to siting criteria, cumulative risk assessments, and the need to base decisions on sound science.

We are disseminating the comments that deal with these environmental justice issues in the following manner: (1) We are forwarding the comments on RCRA facility siting to the Office of Solid Waste's (OSW) RCRA Siting Workgroup and to the NEJAC's Waste and Facility Siting Subcommittee's Siting Workgroup; (2) we are forwarding the comments on issues affecting RCRA corrective action to the RCRA Subpart S Workgroup, which is developing a rule to establish corrective action requirements for releases of hazardous wastes or hazardous waste constituents to any environmental medium, including ground water, from any solid waste management unit, including regulated units; (3) we are sharing the comments on cumulative risk, multiple exposure, and synergistic effects with the EPA Science Policy Council, the group actively working to address these issues; and (4) the comments on how EPA should respond to RCRA permit challenges based on environmental justice issues are being addressed by OSWER with assistance from the Office of General Counsel, Office of Civil Rights, and any other appropriate party.

EPA also received several comments that did not approve of the Agency's decision to discuss and solicit comments on the more technical environmental justice issues in the context of a RCRA public involvement rule. Many commenters argued that these issues are broad, far-reaching, and impact a much larger constituency than the intended audience for the public participation rulemaking.

EPA acknowledges the breadth of these issues. The preamble to the proposed rule has not been the only forum for discussing these issues. As we discussed above, EPA has received and considered comments from additional stakeholders, including States, the NEJAC, environmental groups, environmental justice groups, and regulated industries in developing the "OSWER Environmental Justice Action Agenda." Furthermore, since the Action Agenda is a living document, OSWER will continue to seek external comments, suggestions and experiences as we strive to ensure environmental justice in all our programs.

B. Pre-Application Meeting and Notice

1. Applicability (Proposed § 124.31(d)). EPA proposed to exempt permit modifications, permit renewals, and permit applications submitted for the sole purpose of conducting post-closure activities from the requirements in § 124.31.

Synopsis of Major Comments on § 124.31(d). A number of commenters stated that the rule should require facilities seeking permit renewals to hold a pre-application meeting. Other commenters recommended that the pre-application meeting requirements apply to facilities making significant changes during the renewal process, or that the permitting agency should have discretion in applying the requirement to renewals. Opposing these commenters, several commenters supported the requirement as proposed and urged EPA to keep the exemption for renewals since many renewal applications simply continue "business as usual." In these cases, said the commenters, the community will have adequate opportunity to participate in the renewal process; for instance, at the draft permit stage.

EPA's Response to Commenters. EPA has decided to expand § 124.31 to cover facilities that make a significant change at permit renewal. For the purposes of § 124.31, a "significant" change in facility operations is a change that is equivalent to a class 3 modification in § 270.42, e.g., operating conditions change significantly.

The Agency believes that this approach is a common sense compromise that will ensure adequate public participation in the necessary cases. At the same time, the regulated community will have the assurance that facilities undergoing minor changes will be spared unnecessary administrative burden.

EPA will continue the exemption for facilities that submit permits for the purpose of conducting post-closure activities. As we stated in the proposed rule, the goals of the pre-application meeting (e.g., establishing an early dialogue between the facility and the public) do not apply at most post-closure facilities. EPA's experience is that the public has usually been concerned with permit decisions relating to active hazardous waste management operations, as opposed to decisions relating to closed facilities. In addition, most post-closure activities are mandatory (e.g., maintenance of a closed unit) and involve fewer discretionary judgments than are involved in issuing an operating permit. The existing public participation

requirements in Part 124 (e.g., the notice and comment period at the draft permit stage) will continue to apply. Since closure and post-closure plans are included in the permit application, and become part of the permit, they will be available for public review and comment along with the application and the draft permit. Any changes to these plans after permit issuance will follow the modification procedures in § 270.42, which also have public notice requirements. We think that the existing process provides sufficient public involvement in post-closure permitting.

While we are retaining the exemption for post-closure permit applications in the final rule, we have tried to clarify our intent in the applicability requirements. Specifically, we have clarified that the exemption applies to facilities seeking permits solely to conduct post-closure activities, as well as to facilities seeking permits to conduct post-closure activities along with corrective action. Our intent in the proposal, which remains our intent in the final rule, was to distinguish post-closure facilities from facilities with operating units. However, someone could have read the proposed rule as not providing an exemption for post-closure facilities with remaining corrective action obligations (which post-closure facilities often have). Because the rationale for exempting post-closure activities applies whether or not the facility is also performing corrective action, EPA has added language to §§ 124.31(a) and 124.33(a) to clarify our intent.

2. Meeting Requirements (Proposed § 124.31(a)-(b)). In these two paragraphs, EPA proposed to require the permit applicant to hold at least one meeting with the public before submitting the part B permit application. The proposed rule listed topics that the applicant must cover and required the applicant to submit a record of the meeting and a list of attendees.

Synopsis of the Major Comments on § 124.31(a)-(b). The commenters generally expressed support for the pre-application meeting. Few commenters opposed EPA's proposal to have a meeting early in the process, though many suggested changes to the proposed rule itself.

Several commenters thought that the pre-application stage is too early for a public meeting. Some commenters stated that neither the applicant nor the agency could provide the public with accurate and complete information about the facility at such an early stage. Moreover, they noted, the application could change dramatically between the

pre-application meeting and application submittal.

Some commenters asked EPA to clarify the record-keeping requirements in the final rule. A number of commenters opposed the requirement, with some commenters opposing the term "record" because it would qualify the meeting summary as an official document and make it subject to litigation. Other commenters opposed the rule's requirement that the applicant submit the record as a component of the part B permit application.

Concerning whether the permitting agency should conduct, or even attend, the meeting, the comments varied. Some commenters supported agency attendance because the agency would provide the meeting with credibility and a source of accurate information. Other commenters expressed concern that agency attendance would interfere with the "open and informal dialogue" between the facility owner and the public.

Finally, many commenters supported alternatives to the pre-application meeting. Numerous commenters backed the idea of combining pre-application meetings with the siting meetings that many States already require. A few commenters noted that EPA should allow such a combination only where the State meeting fulfills all the requirements of the pre-application meeting. Another group of commenters supported other options, such as using an Intent-to-Submit form in place of the meeting or holding the meeting after application submittal.

EPA's Response to Commenters. Section 124.31(b) of the final rule requires the facility to hold a meeting prior to submitting the part B permit application; however, the rule language no longer lists specific topics that the facility must cover in the meeting, requiring instead that the facility solicit questions from the community and inform the community about proposed hazardous waste management activities. After the meeting, the facility must prepare a "summary" of the meeting and submit it as a component of the part B permit application. The agency should use its judgement in deciding whether to attend the meeting.

EPA disagrees with the commenters who stated that the pre-application stage is too early to hold a meeting with the public. The most important goal we hope to achieve from the pre-application meeting requirement is the opening of a dialogue between the permit applicant and the community. We believe that the applicant should open this dialogue at the beginning of the process. The meeting will give the

public direct input to facility owners or operators; at the same time, facility owners or operators can gain an understanding of public expectations and attempt to address public concerns in their permit applications (see the discussion two paragraphs below). We hope that this requirement will help address the public concern that public involvement occurs too late in the RCRA permitting process. Although the Agency agrees with the commenters that the early timing of the meeting may prevent the agency and the applicant from having complete information, we believe that the benefits of early public involvement and early access to information outweigh the drawbacks of incomplete information.

In any case, EPA does not intend for the pre-application meeting to be a forum for examining technical aspects of the permit application in extensive detail; such technical examination is more suited to the draft permit stage. Instead, the pre-application meeting should provide an open, flexible, and informal occasion for the applicant and the public to discuss various aspects of a hazardous waste management facility's operations. We anticipate that the applicant and the public will share ideas, educate each other, and start building the framework for a solid working relationship. Of course, the public retains the opportunity to submit comments throughout the process.

EPA has also revised the pre-application meeting requirements in the final rule to make them more straightforward and more flexible than the requirements in the proposed rule. The Agency is trying to provide flexibility in the way that permit applicants hold pre-application meetings. To this end, we have removed the list of required discussion topics, proposed in § 124.31(a). In addition, we have removed from the rule provisions that the commenters considered vague, including the requirement that the applicant describe the facility "in sufficient detail to allow the community to understand the nature of the operations to be conducted at the facility and the implications for human health and the environment." We agree with commenters that such a requirement would be difficult to implement and enforce.

While we have removed such requirements from the final rule, we expect permit applicants to follow the spirit of the proposed requirements. For instance, we encourage permit applicants to address, at the level of detail that is practical at the time of the meeting, the topics we identified in § 124.31(a) of the proposed rule: the

type of facility, the location, the general processes involved, the types of wastes generated and managed, and implementation of waste minimization and pollution control measures. The discussions may also include such topics as the transportation routes to be used by waste transporters and planned procedures and equipment for preventing or responding to accidents or releases. These are examples of the types of issues that might be of particular concern to a community and about which the community might be able to provide useful suggestions to the applicant. The applicant might then be able to incorporate that information into the proposed facility design or operations, either as part of the initial application, if time allows, or at subsequent stages in the process (e.g., in submitting revisions to its application, or in responding to a Notice of Deficiency issued by the permitting agency). By learning about and addressing public concerns up front, the applicant may be able to prevent misunderstanding from escalating into community opposition.

Moreover, the applicant should make a good faith effort to provide the public with sufficient information about the proposed facility operations. While we do not expect applicants to go into extensive detail at the pre-application stage, they should provide the public with enough information to understand the facility operations and the potential impacts on human health and the environment. In addition, as we emphasized in the preamble to the proposed rule (59 FR 28691), the permit applicant should encourage full and equitable public participation by selecting a meeting date, time, and place that are convenient to the public.

The final rule requires the applicant to submit a "summary" of the pre-application meeting as a component of the part B permit application. EPA shares the concern of several commenters that "the record" could be subject to litigation, for instance, on the basis of inaccuracy. EPA's intent in this rule is to foster communication and mutual understanding, not to create divisiveness and additional points of dispute in the permitting process. Thus, we have deleted the word "record" and replaced it with "summary" in the final rule. We do not intend for the meeting summary to be a verbatim account of the meeting; the Agency is aware of how difficult it is to keep a word-for-word record of a public meeting. Applicants should make a good faith effort to provide an accurate summary of the meeting and a list of all attendees who

wish to identify themselves (see § 124.31(b) of the final rule).

In accordance with our intent in the proposed rule, we are requiring the permit applicant, in the final rule, to submit the summary as a component of the part B permit application. Since the part B application is available for review by the public, requiring the meeting summary to be part of the application assures that people who are unable to attend the meeting will have an opportunity to learn what transpired at the meeting. In the proposed rule, however, the Agency neglected to add the summary to the list of part B requirements in § 270.14(b). We have added this reference in the final rule.

The pre-application meeting summary will be useful to the permitting agency. The summary will alert the agency to important community concerns, areas of potential conflict, and other issues that may be relevant to agency permitting decisions. In addition, the meeting attendee list will help generate a mailing list of interested citizens. (The permitting agency is responsible for developing a representative mailing list for public notices under § 124.10). The list of attendees from the pre-application meeting will assist the permitting agency in identifying people or organizations to include on the mailing list so that it represents everyone who demonstrates an interest in the facility and the permit process. It has been EPA's experience that mailing lists often are not fully developed until the permitting agency issues the draft permit for public comment. Since EPA seeks to increase public participation earlier in the process, generation of a mailing list should precede such activities. A mailing list developed pursuant to § 124.10 could also be available to enhance public participation in other Agency or community-based initiatives.

The actual timing of the meeting is flexible in the final rule. The Agency believes that flexibility is necessary because the optimal timing for the meeting will vary depending on a number of factors, including the nature of the facility and the public's familiarity with the proposed project and its owner/operator.

In today's rule, we require the facility to conduct the pre-application meeting. We believe that the applicant should conduct the meeting in an effort to establish a dialogue with the community. We encourage permitting agencies to attend pre-application meetings, in appropriate circumstances, but the agency should not run the pre-application meeting. Although agency attendance may, at times, be useful in

gaining a better understanding of public perceptions and issues for a particular facility, it may undercut some of the main purposes of the meeting, such as opening a dialogue between the facility and the community, and clarifying for the public the role of the applicant in the permitting process.

In the proposed rule, EPA solicited comments (see 59 FR 28702) on the option of allowing a State siting meeting to substitute for the pre-application meeting. EPA is not including this option in the final rule, because doing so would defeat some of the purposes of the pre-application meeting (e.g., establishing an open dialogue on a range of RCRA permitting issues that may differ from siting issues). Some commenters suggested that siting meetings and pre-application meetings be combined. There is nothing in today's rule to preclude States and permit applicants from working together to combine these meetings. EPA encourages them to do so, provided that the combined meetings fulfill the pre-application meeting requirements in today's rule.

3. Notice of the Pre-Application Meeting (§ 124.31(c)). Paragraph (c) of proposed § 124.31 required the facility to give notice of the pre-application meeting at least 30 days prior to the meeting "in a manner that is likely to reach all affected members of the community." EPA proposed to require the facility to give the notice in three ways: as a display advertisement in a newspaper of general circulation; as a clearly-marked sign on the facility property; and as a radio broadcast. Each of these notices had to include the date, time and location of the meeting, a brief description of the purpose, a brief description of the facility, and a statement asking people who need special access to notify the applicant in advance.

Synopsis of the Major Comments on § 124.31(c). Most commenters expressed general support for the expanded notice requirements, but questioned specific aspects of the proposal. The commenters also asked for flexibility in choosing the types of notice that would best reach different communities.

The newspaper advertisement requirement brought up the most controversy. Some commenters challenged as vague the provision that the facility publish the notice in the local paper and also in papers of adjacent counties.

A number of commenters pointed out problems with requiring a large sign at the facility. Some commenters mentioned that nobody would pass near enough to some rural facilities to see the

sign. Other commenters reminded EPA that some communities have ordinances that ban large signs. The commenters urged that the rule be more flexible and allow applicants to place signs at nearby intersections or on town bulletin boards. Other commenters recommended that the agency approve the sign or grant waivers where communities ban signs.

The commenters did not express many objections to the radio requirement, but asked for overall flexibility in the notice requirements.

EPA's Response to Commenters. In response to these comments, EPA has enhanced the flexibility of the final rule. Instead of requiring the applicant to provide three specific types of public notice, as in the proposed rule, the final rule specifies only one type of notice (i.e., the display advertisement). The other notices must fall within broader categories—one must be a broadcast announcement and one must be a sign—but are otherwise flexible.

We have decided to retain the display ad requirement because of the expanded public notice it will provide; at the same time, we have increased the flexibility of the requirement by moving some of the proposed rule's more general provisions out of rule language and into guidance, both in today's preamble (see below) and in the future guidance document for implementing this rule.

Section 124.31(d) requires the applicant to keep documentation of the public notice and provide the documentation to the permitting agency upon request. The reason for this requirement is to provide proof of the public notice that can be verified by the permitting agency. We do not want this requirement to be burdensome for the facility. Instead, we encourage the facility to keep a simple file for the notice requirements. Items for inclusion in the file may include: copies of the newspaper announcement, a receipt or affidavit of the radio announcement, a photograph of the sign, or a receipt of purchase for the sign.

The Agency expects that applicants and permit holders will make a good faith effort to announce the pre-application meeting to as many members of the affected community as possible.

- The newspaper advertisement. The applicant must print a display advertisement in a newspaper of general circulation in the community. The display ad should be located at a spot in the paper calculated to give effective notice to the general public. The ad should be large enough to be seen easily by the reader. In addition to the display ad, we also encourage facilities to place

advertisements in free newspapers and community bulletins.

In some cases, potential interest in the facility may extend beyond the host community. Under these circumstances, we encourage the applicant either to publish the display ad so that it reaches neighboring communities or to place additional ads in the newspapers of those communities.

- The visible and accessible sign. The final rule requires the applicant to post the notice on a clearly-marked sign at or near the facility. If the applicant places the sign on the facility property, then the sign must be large enough to be readable from the nearest point where the public would pass, on foot or by vehicle, by the site. The Agency anticipates that the signs will be similar in size to zoning notice signs required by local zoning boards. If a sign on the facility grounds is not practical or useful—for instance, if the facility is in a remote area—then the applicant should choose a suitable alternative, such as placing the sign at a nearby point of significant vehicular or pedestrian traffic. In the case that local zoning restrictions prohibit the use of such a sign in the immediate vicinity of the facility, the facility should pursue other available options, such as placing notices on a community bulletin board or a sign at the town hall or community center. EPA intends the requirement that the sign be posted "at or near" the facility to be interpreted flexibly, in view of local circumstances and our intent to inform the public about the meeting. In addition to the requirements of § 124.31, we encourage the applicant to place additional signs in nearby commercial, residential, or downtown areas.

- The broadcast media announcement. The final rule requires the applicant to broadcast the notice at least once on at least one local radio or television station. EPA expects that the applicant will broadcast the notice at a time and on a station that will effectively disseminate the notice. The applicant may employ another medium with prior approval of the Director. We encourage the applicant to consult the preamble to the proposed rule (59 FR 28690) for recommendations on choosing the best circumstances for the broadcast announcement.

EPA will soon issue a guidance document to assist facilities and agencies in implementing the expanded public participation requirements. The guidance document will include more detailed discussions on the approaches to broad and equitable public notice that we are emphasizing in today's preamble.

C. Notice at Application Submittal (§ 124.32)

1. Applicability (Proposed § 124.32(c)). The proposed rule required the permitting agency to send a notice to the facility mailing list upon receipt of a permit application. EPA proposed that the rule apply to all new and interim status facilities, but not to permit modifications or applications submitted for the sole purpose of conducting post-closure activities.

Synopsis of Major Comments on Proposed § 124.32(c). The commenters generally supported this provision of the proposed rule. A few commenters recommended that EPA apply the provision to modifications, post-closure permits, and interim status facilities.

EPA's Response to Commenters. The final rule retains the applicability standards of the proposed rule. We continue to believe that the notice at application submittal is an effective means to let the community know that the permitting agency has received a permit application. The notice allows members of the community to keep track of new or existing facilities and to review, concurrently with the permitting agency, the permit application, which will be available for review at a location specified by the permitting agency (either in the vicinity of the facility or at the permitting agency's office). We suggest that the permitting agency consult the public when choosing a suitable location to place the application materials for public review.

The notice requirement does not apply to permit modifications or permit applications submitted for the sole purpose of conducting post-closure activities or post-closure activities and corrective action at a facility. The permit modification requirements in § 270.42 already include provisions for providing public notice of modification requests. We explain the exemption for post-closure activities in section B.1. above.

2. Responsibility and Timing (Proposed § 124.32(a) and (b)). The proposed rule directed the permitting agency to give the notice "within a reasonable period of time after the application is received by the Director." The proposed rule also listed the information that must go in the notice.

Synopsis of Major Comments on Proposed § 124.32(a) and (b). Many of the commenters provided suggestions on who should be responsible for the notice at application submittal. The majority of these commenters supported EPA's proposal, agreeing that the Director should issue the notice. A few commenters expressed concern over the

timing of the notice. They suggested that EPA rewrite the rule to require the Director to issue the notice within 30 days of application submittal.

EPA's Response to Commenters. These provisions have not changed from the proposed rule to the final rule. EPA maintains its position that the permitting agency should be responsible for providing the public notice at application submittal. Providing the notice will demonstrate clearly that the permitting agency's role in the process has begun.

We anticipate that the permitting agencies will issue timely notices and, thus, we have decided not to prescribe a time frame for agency issuance of the notice at permit application.

D. Information Repository

1. **Applicability/Use/Responsibility** (Proposed §§ 124.33(a) and 270.30(m)). EPA proposed to give the Director the authority to require the facility to establish and maintain an information repository during the permitting process (§ 124.33(a)) or during the life of a permit (§ 270.30(m)). The purpose of the repository, as proposed, was to make information available to the public during the permit issuance process and during the life of a permit.

Synopsis of Comments on Proposed §§ 124.33(a) and 270.30(m). A number of the comments asked EPA for exemptions from the repository "requirement," especially for boilers and industrial furnaces (BIFs) and federal facilities that must fulfill similar standards under other rules. Many commenters asked for flexibility, suggesting that EPA allow the Director to decide when to require a repository. Some commenters suggested that the Director use this authority only in cases where the community shows true need or public interest when the facility is high. Making a contrary point, a group of commenters argued that the repository should be mandatory for all facilities. Another group of commenters insisted that the permitting agency should be responsible for the repository, or at least split the responsibility with the facility.

EPA's Response to Commenters. In the final rule, EPA has rewritten §§ 124.33(a) and 270.30(m) to better reflect our original intent in proposing the information repository requirement. Our intent was for permitting agencies to use the information repository requirement sparingly. We anticipate that the Director will require such a repository only in special cases where a significant amount of public concern has surfaced or where the community has unique information needs.

Many commenters suggested exemptions from the "information repository requirement." However, the information repository is not a requirement that applies to a predetermined group of facilities. Instead, the information repository is a public involvement tool that today's rule makes available to permitting agencies for use on a case-by-case basis. Accordingly, there is no need for exemptions from §§ 124.33 or 270.30(m).

Some of the confusion over this section may be the result of the language in the proposed rule. We have reworded §§ 124.33 and 270.30(m) in the final rule to make clear that the Director shall assess a variety of factors, including the status of existing repositories and the community's proximity to a copy of the administrative record, when considering whether or not to require a repository at any facility. So, for instance, if the Director determines that public interest warrants a repository at hypothetical Facility X, but finds that a BIF repository already existing at the facility is responsive to the public interest, then the Director may determine that the facility has no need for a repository under §§ 124.33 or 270.30(m). Or, if the existing repository does not completely satisfy the need that the Director identified, then the Director may specify additional steps that the facility must take to make the repository meet the public need. At Facility X, for instance, the Director may require the facility to make available more information on the general permitting standards, or on the permit application and technical standards for the other units on site, aside from the BIF unit. The facility could then add this information to the existing repository if the repository meets the requirements of §§ 124.33 or 270.30(m).

2. **Contents** (Proposed § 124.33(b) and (e)). The proposed rule language required the repository to contain all "documents, reports, data, and other information deemed sufficient by the Director for public understanding," as well as information on public involvement activities and how to get on the facility mailing list.

Synopsis of the Major Comments on Proposed § 124.33(b) and (e). A number of commenters recommended specific documents and types of documents (e.g., the permit application, all relevant fact sheets) that EPA should require in the information repository provisions. Some commenters insisted that the content requirements in the proposed rule were too vague. Other commenters thought that EPA should ban certain materials (e.g., public relations

literature) from the information repository.

EPA's Response to Commenters. We have changed the repository content requirements in the final rule. The new provision requires the repository to hold "all documents, reports, data, and information deemed necessary by the Director to fulfill the purposes for which the repository is established." We have tried to be as flexible as possible in this section since the permitting agency could require a facility to establish a repository at any stage during any permit process or for any time during the life of the facility. Moreover, the requirement to establish a repository will be imposed by the Director on a case-by-case basis; after taking into account the site-specific factors in each case, the Director will decide what materials are appropriate for the repository.

The final rule gives the Director the authority to limit the contents of the repository. While the rule creates no outright bans on materials, EPA anticipates that the Director will use his or her discretion to ensure that repository materials are relevant to permitting activities and to prevent parties from placing inappropriate materials in the repository. We encourage permitting agencies, in the spirit of equitable public participation and access to information, to consult the public regarding what materials would be most useful to members of the surrounding community.

3. **Location** (Proposed § 124.33(c)). The proposed rule stated that the facility should choose the location for the repository in a place with suitable public access. If the Director opposed the site, then the Director could choose a more appropriate location. The proposed rule also required the repository to be open during reasonable hours and to give the public access to photocopy service (or an alternative means for people to obtain copies).

Synopsis of Public Comments on § 124.33(c). Several commenters expressed concern over the geographic location of the repository. Other commenters asked that EPA rewrite the rule to allow for on-site repositories.

EPA's Response to Commenters. EPA has tried to be flexible in revising the final rule. While we expect that the Director will only infrequently require repository, we anticipate that those situations will all be different. For that reason, we have avoided writing narrow prescriptions for the location of the repository. Instead, § 124.33(c) of the final rule retains the provision allowing the facility to choose the location. We encourage facilities, in the spirit of

equitable public participation and access to information, to involve the public when suggesting a location for the repository. The Director has the discretion to choose a more suitable location if he or she finds that the one chosen by the facility is unsuitable based on access, location, hours of availability, or other relevant criteria. The Director should exercise this authority sparingly; we are anticipating that, in the great majority of cases, the facility will choose a suitable location. EPA encourages facilities to establish repositories off-site (i.e., within the community where the facility is located) whenever an off-site repository is feasible and would be more readily accessible to the public. Today's rule does not, however, preclude the use of on-site repositories.

4. **Timing and Duration** (Proposed § 124.33(f)). The proposed rule required the facility to maintain and update the repository for a time period determined by the Director. The proposal also stated that the Director could require the repository at any time during the application process for a RCRA permit or during the active life of a facility.

Synopsis of the Major Comments on Proposed § 124.33(f). The commenters submitted a variety of comments concerning the timing and duration of the repository. Some commenters thought that permitting agencies need flexibility in applying the repository requirement. Others thought that EPA should require the repository to open and close at specific points during the permitting process. One group of commenters insisted that EPA include a provision in the rule to allow for automatic closure of the repository once the permit is issued, denied, or appealed.

EPA's Response to Commenters. In the final rule, EPA clarifies its intent that the Director have the discretion to apply the repository requirement at any time during the permitting process or the life of a facility. Given that it is within the Director's discretion whether to establish a repository at all, we believe that it would be inappropriate to prescribe specific timing and duration requirements that are triggered by the creation of a repository; rather, the Director should decide on questions of timing and duration on a case-by-case basis. The final rule continues the proposed rule's provision that the Director determine the duration of the repository. The final rule provides that the Director can close the repository, based on the same standards (found in paragraph (a)) that the Director uses when assessing the need for a repository.

E. Trial Burn Notices

1. **Notice of the Trial Burn for Permitted Combustion Facilities** (Proposed §§ 270.62(b)(6) and 270.66(d)(3)). Permits for new hazardous waste combustion facilities must include a plan, approved by the permitting agency as part of the permit, that describes how the facility will conduct the trial burn. However, because construction of a new facility may take a considerable period of time, the trial burn itself might not take place until several years after permit issuance. The proposed rule required the permitting agency to give public notice of the impending trial burn for permitted incinerators and BIFs. Under the proposed rule, the permitting agency would send a notice to the facility mailing list and appropriate units of State and local governments announcing the scheduled commencement and completion dates for the trial burn. The notice would also provide the public with contact information at the permitting agency and the facility and a location where members of the public could review the approved trial burn plan. The proposal required the permitting agency to mail the notice within a reasonable time period prior to the trial burn.

Synopsis of the Major Comments on Proposed §§ 270.62(b)(6) and 270.66(d)(3). We received both positive and negative comments on the proposed notice of trial burn for permitted combustion facilities. The supporters noted the importance of informing the public of the anticipated time period for conducting the burn, because a significant amount of time may elapse between issuing the permit and conducting the trial burn.

Those who opposed the trial burn notice asked what benefit would accrue from public notice of an impending, scheduled trial burn for a new (permitted) facility. One commenter asked EPA to discuss the purpose for requiring this notice from a new facility, considering that the schedule is set out in the permit and the trial burn plan is already open for public comment as part of the draft permit. Some commenters thought that the other permitting events already provide sufficient opportunity for public comment. Other commenters opposed the requirement that the permitting agency give the trial burn notice, claiming that delays would ensue when the agency could not publish the notice on time.

EPA's Response to Commenters. EPA has decided to finalize the trial burn notice provisions for permitted facilities as proposed. The Agency agrees with

the commenters who noted the importance of keeping the community up to date on permitting activities at the facility. Several years may pass between the approval of the trial burn plan and the actual date of the trial burn. During the intervening time, the public may not necessarily remain up to date on activities at the facility. The trial burn is a significant step in the process of a combustor moving toward full operation; experience has shown that the public is often interested in knowing when the burn will occur so that citizens can review the trial burn results. Thus, we remain committed to giving notice of the impending trial burn at permitted facilities.

The final rule requires the permitting agency to send the notice to the facility mailing list. While we do not specify a time period during which the permitting agency should send out the notice, we anticipate that permitting agencies will typically notify the public at least 30 days before the trial burn.

The final rule does not provide for a comment period after the permitting agency gives notice of the trial burn dates. A number of commenters asked EPA what the purpose of such a notice would be, if not to open a comment period. Other commenters asked the Agency to make clear whether or not the rule would require a comment period during the trial burn stage. EPA decided that a comment period during the trial burn phase would not be necessary or appropriate. The public has already had the opportunity to be involved with, and comment on, the trial burn plan during the draft permit stage. Our intent in providing for the notice at this stage is to make the public aware of an impending trial burn. The notice will serve as an update, rather than the opening of a comment period.

Finally, EPA has clarified in §§ 270.62(b)(6) and 270.66(d)(3) that a new hazardous waste combustion facility applying for a permit may not commence its trial burn until after the permitting agency has issued the required notice. It was clear from the proposal that we intended for the permitting agency to issue the notice before the trial burn. However, the proposed rule language did not explicitly state the obvious corollary, which was that the facility may not commence the trial burn until after the notice.

EPA does not believe that the notice requirement established by today's rule will delay trial burns. The notice requirement is straightforward and easy to implement; we do not anticipate that permitting agencies will fail to issue the required notices in a timely fashion.

Because the notice is purely informational, EPA will be flexible in interpreting the requirement that the notice be mailed a reasonable time before the commencement of the trial burn. Ideally, the Agency anticipates that permitting agencies will mail the notice at least thirty days before the trial burn. However, as long as the notice is mailed sufficiently in advance of the scheduled trial burn so that the recipients would be expected to receive the notice prior to the commencement date, EPA would consider the notice timely.

It is EPA's intent that the trial burn notice requirements in §§ 270.62(b)(6) and 270.66(d)(3) apply only to initial trial burns, and not to subsequent trial burns that may be conducted as part of the permit modification procedures. EPA believes that the trial burn notices required by today's rule are not necessary in these latter circumstances, since the amount of time between modification approval and the subsequent trial burn is typically much shorter than the amount of time that may elapse between permit issuance and the initial trial burn. Moreover, the modification procedures in § 270.42 include provisions for involving the public throughout the modification submittal and approval process (e.g., through notices or public meetings). Of course, if there are substantial unforeseen delays between the approval of the modification request and the trial burn, EPA suggests that the permitting agency issue a notice in accordance with the procedures set forth in today's rule.

2. Notice of Planned Trial Burn Plan Approval for Interim Status Combustion Facilities (Proposed § 270.74(b) and (c)(3)). Trial burns at interim status facilities generally take place before permit issuance so that the permitting agency can set operating conditions in the permit based on the results of the trial burn. The proposed rule required the permitting agency to give public notice of the tentative approval of a trial burn plan for interim status incinerators and BIFs. The notice requirements are the same as those proposed for permitted incinerators and BIFs, except for an additional provision that the notice contain a schedule of activities that are required prior to permit issuance, including the permitting agency's anticipated schedule for trial burn plan approval and the actual trial burn.

Synopsis of Major Comments on § 270.74(b) and (c)(3). Many of the comments described in section E.1. above with regard to the trial burn notice for permitted incinerators and

BIFs also are relevant to the trial burn notice for interim status incinerators and BIFs (e.g., comments on the timing of the notice). A number of commenters raised the issue of a comment period on the trial burn plan for interim status facilities. A few commenters supported the idea, some opposed it, and several more asked EPA to clarify whether or not we would require a comment period on the tentatively approved trial burn plan. One commenter noted that this additional information was critical for interim status facilities where the public has not yet had an opportunity for involvement.

EPA's Response to Commenters. EPA has decided to finalize the provisions for interim status facilities with two slight changes from the proposal. First, the final rule provides for notice of the Director's intention to approve a trial burn plan, rather than his or her "tentative approval." In response to commenter concerns that the notice could be an extra time-consuming step in the process, EPA has changed the language to better reflect its intent that the notice occurs in the final stages of review, rather than being a separate step following completion of review.

Second, we proposed to place the notice requirements in a newly created § 270.74, which contained interim status combustion permitting requirements. However, since EPA is not finalizing the combustion permitting sections of the proposed rule at this time, we have integrated the notice requirements with the regulations for the permitting of interim status combustion facilities, i.e., § 270.62(d) for incinerators and § 270.66(g) for BIFs.

Although the Agency has not changed the trial burn plan notice requirements for interim status combustors in the final rule, the requirements are in a different format than in the proposal. First, the notice requirements are now located in the centers of the paragraphs (§ 270.62(d) for incinerators and § 270.66(g) for BIFs) along with other permitting requirements. Since the notice contents for interim status facilities differ from the contents for permitted facilities with regard to announcing planned approval of the trial burn plan, we are amending §§ 270.62(d) and 270.66(g) to list the specific information that the permitting agency must include in the notices for interim status combustors. Second, we do not list the timing and distribution requirements for the notice for interim status facilities, as we did in the proposed rule. Instead, each of these paragraphs refers the reader to another paragraph (§ 270.62(b) and § 270.66(d), respectively) that covers the notice of

the trial burn for permitted facilities. For instance, § 270.62(d) states that the agency shall issue the notice "in accordance with the timing and distribution requirements of (b)(6) of this section." The requirements in (b)(6) are the new notice requirements that we are issuing today for permitted combustion facilities (see section E.1. above). In following the standards in (b)(6), the permitting agency will send the notice to the facility mailing list and the appropriate units of State and local government within a reasonable period of time before the trial burn. Section 270.66(g) takes the same approach for BIFs by referring to paragraph (d) of that section.

For permitted combustion facilities, EPA has clarified in §§ 270.62(b)(6) and 270.66(d)(3) that a facility applying for a permit may not commence its trial burn until after the permitting agency has issued the required notice. EPA does not believe that comparable clarifying language is necessary in §§ 270.62(d) or 270.66(g) for the notice of planned approval of a trial burn plan for an interim status facility. EPA believes it is clear under these provisions that the permitting agency will not approve a plan and, consequently, the facility cannot commence its trial burn, until issuance of the required notice.

The role of the notice for interim status BIFs and incinerators is much the same as the notice for permitted facilities, i.e., to keep the public informed throughout the trial burn stage. The final rule does not require a comment period after the permitting agency gives notice of the planned approval of the trial burn plan and the trial burn dates for interim status facilities. The trial burn notice, like the other notices required by this rule, is primarily intended to keep the community informed while not slowing down the permitting process. Since interim status facilities are already operating, and continue to operate while the permitting agency evaluates the permit application, EPA does not believe it would generally be in the public interest to delay the evaluation process in order to provide a formal response to comments on the trial burn plan. However, if members of the public submit significant information or views relating to the trial burn plan, the Director should consider this information, and may choose to respond in writing at the time of plan approval. In addition, a formal comment period will, of course, still take place after draft permit issuance.

EPA believes that the final rule strikes the appropriate balance between public

involvement and the efficiency of the permitting process. The notice alerts the public of the impending trial burn, and of the opportunity to review the trial burn plan. Since EPA is not yet finalizing the other revisions to combustion permitting procedures proposed in § 270.74, trial burn plans for interim status combustors may not always be available for review with the rest of the application. Through today's notice requirement, the public will still have an opportunity to stay informed and to review the plan before the Director approves it.

EPA is currently considering and addressing the comments it received on the revised combustion permitting procedures. If those procedures are finalized and go into effect as proposed, including the provision requiring facilities to submit trial burn plans with permit applications, the public will have the opportunity to review and submit opinions or suggestions on the proposed trial burn plan at any time after the facility submits the application. At that time, EPA will have the opportunity to consider any such submissions in the process of reviewing the plan. Accordingly, EPA is not requiring a comment period for the planned trial burn plan approval in this rule, since such a requirement could likely be rendered unnecessary in the future.

V. State Authority

A. Applicability of Today's Rule in Authorized States

The overall effect of today's final rule is to increase the stringency of the RCRA permitting process. Therefore, States that are authorized to administer and enforce the RCRA program in lieu of EPA under section 3006 of RCRA are required to modify their programs by adopting equivalent requirements if necessary (see § 271.21(e)). States must submit their proposed program modifications to EPA for approval according to the schedules set forth in section V.B. below.

EPA is promulgating today's rule pursuant to statutory authority that existed prior to the Hazardous and Solid Waste Amendments (HSWA) of 1984. As we explained in more detail in the proposed rule (59 FR 28703-04), EPA will implement §§ 124.31 (the pre-application meeting), 124.32 (the notice at application submittal), and 124.33 (the information repository) of this rule in authorized States only when EPA is processing permit applications for hazardous waste management units over which it has the basic permit issuance authority (e.g., BIFs in States not yet

authorized to issue BIF permits). EPA has added language to §§ 124.31(a), 124.32(a), and 124.33(a) of the final rule to clarify that EPA will implement these sections only for such applications. For all other permit applications in authorized States, the requirements of these sections will not take effect until the States adopt and become authorized for this rule.²

Under this approach, EPA will be implementing §§ 124.31, 124.32, and 124.33 only where it is the basic permitting authority for the unit. EPA will, of course, implement these sections in non-authorized States. EPA will also implement these sections in authorized States when the permit application in question contains one or more hazardous waste management units for which the State is not authorized to issue RCRA permits and, thus, EPA has basic permit issuance authority. For example, EPA will implement today's rule when processing an application that includes a BIF if the State is not authorized to issue BIF permits. The facility with the BIF unit will be subject to all the applicable requirements in today's rule.

However, if the State is authorized to issue RCRA permits for all of the hazardous waste management units in an application, then EPA will not implement the requirements in §§ 124.31, 124.32, and 124.33. EPA will not implement those provisions in such a case, even though EPA may retain authority to issue a HSWA "rider" relating to the units in the application (e.g., authority to control air emissions from certain units under 40 CFR Part 264 Subparts AA, BB, and CC), or relating to the facility as a whole (e.g., corrective action authority under 40 CFR § 254.101). For example, EPA will not implement §§ 124.31, 124.32, and 124.33 when processing the corrective action portion of a tank storage permit application in an authorized State.

The Agency believes that this arrangement best implements the intent

of today's rule. EPA designed the pre-application meeting, the notice at application submittal, and repository requirements to enhance communication and understanding between the public, the facility owners and operators, and the permitting agency. These requirements will foster a dialogue between facilities and communities with a focus on fundamental permitting issues. EPA believes that these interactions are properly part of the application process for the basic permit to conduct hazardous waste management operations, and not part of the process to evaluate and issue additional conditions through a HSWA rider. Accordingly, and consistent with the proposal, we have explicitly tied these requirements to the basic permit issuance authority for hazardous waste management units.

For most units in most States, the basic permit issuance authority rests with the State. Accordingly, EPA strongly urges authorized States to adopt this rule in an expeditious manner. Specifically, EPA encourages States that have not yet adopted the BIF rule to adopt the new public participation procedures concurrently with their BIF rules, rather than deferring adoption to the somewhat later deadline that applies to today's rule.

In adopting today's rule, authorized States should not include in their approved regulations the limiting language added to the final applicability sections of §§ 124.31, 124.32 and 124.33. This language includes both the limitation of the sections' applicability to "all applications seeking RCRA permits for hazardous waste management units over which EPA has permit issuance authority" and the definition of the phrase "hazardous waste management units over which EPA has permit issuance authority." Obviously, the reference to EPA would be inappropriate in a State rule. Moreover, even if the State changed the language to refer to the State environmental agency, the provision would be unnecessary because authorized States process RCRA permit applications and administer RCRA permits only at facilities with units over which they have permit issuance authority. Accordingly, EPA recommends that States not include in their regulations limiting language similar to that in today's final rulemaking.

² EPA is not including similar limiting language, like the language in §§ 124.31, 124.32, and 124.33, in the other provisions of today's rule. With respect to § 270.14, the requirement to submit the summary of the pre-application meeting with the Part B permit application expressly references § 124.31. Accordingly, where the regulations do not require a meeting, it is clear that the applicant does not need to provide a meeting summary. With respect to the information repository requirement of § 270.30(m), EPA will follow the general principles applicable to the inclusion of the § 270.30 "boilerplate" provisions in HSWA portions of RCRA permits (see, e.g., *In re General Motors Corp.*, RCRA Appeal Nos. 90-24, 90-25, at 23 (EAB Nov. 6, 1992)). Finally, §§ 270.62 and 270.66 apply only where EPA has permit issuance authority over incinerators and BIFs, respectively, so there is no need to limit the applicability of the specific requirements added to these sections today.

B. Schedules and Requirements for Authorization

40 CFR 271.21(e) requires States with final authorization to modify their programs to reflect federal program changes and submit the modifications to EPA for approval. The deadlines for State modifications are set out in § 271.21(e)(2) and depend upon the date of promulgation of final rules by EPA. Thus, because EPA has promulgated today's rule before June 30, 1996, States must modify their programs, if necessary, to adopt this rule before July 1, 1997 (or July 1, 1998 if a State statutory change is needed). States then must submit these program modifications to EPA according to the schedules in § 271.21(e)(4). Once EPA approves the modifications, the State requirements become RCRA Subtitle C requirements.

States with authorized RCRA programs may already have requirements similar to those we are proposing today. EPA has not assessed these State regulations against the final federal regulations to determine whether they meet the tests for authorization. Thus, similar provisions of State law are not authorized to operate in lieu of today's RCRA requirements until the State submits them to EPA, who then evaluates them against the final EPA regulations. Of course, States may continue to administer and enforce their existing standards in the meantime.

In developing today's final rule, EPA considered impacts on existing State programs. The public participation requirements may be viewed as performance objectives the Agency wants States to meet in their own authorized programs. It is not EPA's intent to restrict States from conducting similar activities that accomplish the same objectives. Therefore, EPA intends to be flexible in reviewing State program submissions and evaluating them against the requirements for authorization.

VI. Permits Improvement Team

In July 1994, EPA created a group of EPA, State, Tribal and local government officials (Permits Improvement Team) to examine and propose improvements to EPA's permit programs. As part of its efforts, the Permits Improvement Team is examining ways to streamline the permitting process, exploring possible alternatives to individual permits, and evaluating ways to enhance public involvement in the permitting process. The Team plans to develop recommendations in each of these areas, discuss them with stakeholders, and

submit them to Agency management for consideration.

The public participation requirements that EPA is promulgating in today's rule are appropriate for the RCRA permitting program as it currently exists. If, however, the nature of the RCRA permitting program changes as a result of the Permits Improvement Team's efforts, then the Agency may amend these procedures, or develop additional procedures. For example, the Team is considering recommending several alternatives to individual permits, such as establishing general permits for RCRA non-commercial storage and treatment units. The process of issuing general permits is very different from the current RCRA permitting process; thus, different approaches for involving the public may be appropriate.

VII. Regulatory Assessment Requirements

A. Executive Order 12866

Under Executive Order 12866, (58 FR 51735, October 4, 1993) the Agency must determine whether a regulatory action is "significant" and, therefore, subject to review by the Office of Management and Budget (OMB) and to the requirements of the Executive Order, which include assessing the costs and benefits anticipated as a result of the regulatory action.

The Order defines "significant regulatory action" as one that is likely to result in a rule that may: (1) have an annual effect on the economy of \$100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local, or tribal governments or communities; (2) create serious inconsistency or otherwise interfere with an action taken or planned by another agency; (3) materially alter the budgetary impact of entitlements, grants, user fees, or loan programs or the rights and obligations of recipients thereof; or (4) raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

The Agency has determined that this rule is not a significant rule under Executive Order 12866. Pursuant to the terms of Executive Order 12866, this section of the preamble summarizes the potential economic impacts of the RCRA Expanded Public Participation rule.

Based upon the economic impact analysis for today's rule, the Agency's best estimate is that the expanded public participation requirements

would result in an incremental national annual cost of \$180,000 to \$500,000.

A complete discussion of the economic impact analysis is available in the regulatory docket for today's rule in a report entitled "Economic Impact Analysis for the RCRA Expanded Public Participation Rule."

Cost Analysis. Today's rule includes several requirements that would result in direct costs to facilities submitting initial permit applications or submitting permit renewal applications that propose a significant change for facility operations (see § 124.31). The analysis estimates the costs to all affected facilities of (1) preparing a public notice announcing the intention to hold a public meeting; (2) disseminating the public notice in a local newspaper, over a broadcast medium, and by posting a sign; and (3) holding a public meeting and preparing a meeting summary.

In addition, the rule gives the Director the discretion to require a facility to set up an information repository, based on the level of public interest or other factors. This requirement can apply anywhere in the permitting process or at any time during the active life of a facility.

The total cost per facility of the above requirements is approximately \$5,000 to \$14,000. Over the next ten years, EPA estimates that between 300 to 450 facilities will incur these costs. The resulting total national annual cost, assuming a discount rate of 7% is estimated to be between \$180,000 to \$500,000 per year.

Summary of Benefits. The RCRA permitting program was developed to protect human health and the environment from the risks posed by the treatment, storage, and disposal of hazardous waste. By improving and clarifying the permitting process, today's rule produces environmental benefits that result from a more efficient permitting process. The following is an explanation of how each of the provisions of today's rule provides benefits.

The main benefit of the expanded public participation requirements of today's rule is to provide earlier opportunities for public involvement and expand public access to information throughout the permitting process and the operational lives of facilities. EPA believes that these requirements will give applicants and permitting agencies a better opportunity to address public concerns in making decisions about the facility and in subsequent permitting activities.

Providing the public with an expanded role in the permit process, by promoting community participation and

input throughout the permitting process, will also help foster continued community involvement after facilities become permitted.

In addition, expanding public involvement opportunities could, in some cases, streamline the permitting process, since the public will raise issues, and the applicant can address the issues, at an earlier stage in the process. Currently, the public is not formally involved in the permitting process until the draft permit stage, which occurs after the permitting agency and the permit applicant have discussed crucial parts of the part B permit application. The Agency anticipates that the earlier participation provided in this rule will address the public concern that major permit decisions may be made before the public has the opportunity to get involved in the process. This earlier involvement may well reduce costs associated with delays, litigation, and other products of disputes.

B. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) of 1980 requires federal agencies to consider "small entities" throughout the regulatory process. Section 603 of the RFA requires agencies to perform an initial screening analysis to determine whether small entities will be adversely affected by the regulation. If the analysis identifies affected small entities, then the agency must consider regulatory alternatives to mitigate the potential impacts. Small entities as described in the Act are only those "businesses, organizations and governmental jurisdictions subject to regulation."

In developing today's rule for expanding public involvement in the RCRA permitting process, EPA was sensitive to the needs and concerns of small businesses. The provisions set forth the minimum requirements necessary to fulfill the public involvement objectives in this rule. Additional examples of activities that facilities may choose to conduct are provided in the preamble for the proposed rule (59 FR 28680) and will be included in a future guidance document, rather than in this rule. EPA's intent is to provide flexibility for a facility to determine, in view of the facility-specific circumstances, the appropriate level of public involvement activities. In addition, EPA recognizes that, in some situations, an information repository could become resource-intensive for a facility or for the local community. EPA has addressed this concern by clarifying, in the final rule, that the information repository is not mandatory for all facilities. The rule

makes clear our intent that the Director reserve the use of the information repository option only for the limited number of facilities that raise high levels of public interest or whose communities have a special need for more access to information.

EPA conducted a small entity impact screening analysis for the proposed rule and determined that there were no small entities significantly impacted (see 59 FR 28680-28711, Section VI.C.). Because the public participation requirements have not increased since the proposal, EPA has determined that the final rule also does not significantly impact small entities.

C. Paperwork Reduction Act

The Office of Management and Budget (OMB) has approved the information collection requirements contained in this rule under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and has assigned OMB control number 2050-0149.

This collection of information is estimated to have a public reporting burden averaging 89.60 hours per response, and to require 34.60 hours per recordkeeper annually. This total includes time for reviewing instructions, searching existing data sources, gathering and maintaining the necessary data, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Chief, Information Policy Branch (2136), U.S. Environmental Protection Agency, 401 M St., SW., Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA."

Display of OMB Control Numbers. EPA is also amending the table of currently approved information collection request (ICR) control numbers issued by OMB for various regulations. This amendment updates the table to accurately display those information requirements contained in this final rule. This display of the OMB control number and its subsequent codification in the Code of Federal Regulations satisfies the requirements of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*) and OMB's implementing regulations at 5 CFR 1320.

The ICR was previously subject to public notice and comment prior to OMB approval. As a result, EPA finds that there is "good cause" under section 553(b)(B) of the Administrative Procedure Act (5 U.S.C. 553(b)(B)) to

amend this table without prior notice and comment. Due to the technical nature of the table, further notice and comment would be unnecessary.

D. Unfunded Mandates Reform Act

Under section 202 of the Unfunded Mandates Reform Act of 1995 (the UMRA), P.L. 104-4, EPA generally must prepare a written statement, including a cost-benefit analysis, for rules with "Federal mandates" that may result in expenditures to State, local, and tribal governments in the aggregate, or to the private sector, of \$100 million or more in any one year. When such a statement is required for EPA rules, under section 205 of the UMRA, EPA must identify and consider alternatives, including the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule. EPA must select that alternative, unless the Administrator explains in the final rule why it was not selected or it is inconsistent with law. Before EPA establishes regulatory requirements that may significantly or uniquely affect small governments, including Tribal governments, it must develop, under section 203 of the UMRA, a small government agency plan. The plan must provide for notifying potentially affected small governments, giving them meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising them about compliance with the regulatory requirements.

For the reasons explained in Section VI.A. above, EPA has determined that this rule does not contain a federal mandate that may result in expenditures of \$100 million or more for State, local, and Tribal governments, in the aggregate, or the private sector in any one year. Rather, EPA projects the total annual costs imposed by today's rule to be less than \$500,000. Thus, today's rule is not subject to the requirements of sections 202 and 205 of the UMRA.

In addition, EPA has determined that this rule contains no regulatory requirements that might significantly or uniquely affect small governments. As stated above, the total costs of the rule are very low. These minimal costs will be incurred by owners and operators of hazardous waste treatment, storage and disposal facilities, which are principally private entities, and federal government agencies. Accordingly, this rule does not impose any requirements that might significantly or uniquely affect small governments.

E. Enhancing the Intergovernmental Partnership

Executive Order 12875. Executive Order 12875 on enhancing the intergovernmental partnership charges federal agencies with establishing meaningful consultation and collaboration with State and local governments on matters that affect them. In most cases, State governments are the level of government that regulates hazardous waste.

EPA has consulted with State officials to develop today's rule. EPA invited several States, representing various parts of the country, to participate in this rulemaking process. These States reviewed and provided feedback on the draft proposal over a period of eight months, and the draft final rule over a period of five months. In addition, these States participated in monthly workgroup meetings via conference call. Their participation and immediate feedback in the workgroup process added considerable value to the rulemaking effort.

EPA contacted additional States in an effort to receive their specific feedback on general permitting and public involvement techniques. EPA solicited State input during a session of the 3rd Annual RCRA Public Involvement National Conference, in which sixteen State representatives participated. The State participants provided numerous helpful suggestions and ideas. In addition, the Agency utilized existing State groups, such as the Association of State and Territorial Solid Waste Management Officials (ASTSWMO), to solicit input on the proposed rule at various stages in the development process. State personnel at the Commissioner level provided input to EPA at bi-monthly meetings of the EPA-State Task Force on Hazardous Waste Management. Through early involvement in the process, State representatives made valuable contributions to the development of today's rule. EPA also received comments from several States following publication of the proposed rule. Many of the States' concerns are addressed by the final rule.

The Relationship of Today's Rule with Indian Policy. Currently, EPA has the responsibility for ensuring the implementation and enforcement of the Subtitle C hazardous waste regulatory program on Indian lands. This responsibility includes the issuance of hazardous waste permits. However, consistent with EPA's Indian Policy of 1984, the Agency will look directly to, and work with, Tribal governments in determining the best way to implement

the public involvement requirements in Indian country. This Indian policy recognizes the sovereignty of federally-recognized Tribes and commits EPA to a government-to-government relationship with the Tribes.

List of Subjects**40 CFR Part 9**

Reporting and recordkeeping requirements.

40 CFR Part 124

Administrative practice and procedure, Hazardous Waste, Reporting and recordkeeping requirements.

40 CFR Part 270

Administrative practice and procedure, Hazardous waste, Reporting and recordkeeping requirements, Permit application requirements, Waste treatment and disposal.

Dated: October 18, 1995.

Carol M. Browner,

Administrator.

For the reasons set out in the preamble, title 40, chapter I, of the Code of Federal Regulations, is amended as follows:

PART 9—OMB APPROVALS UNDER THE PAPERWORK REDUCTION ACT

1. The authority citation for part 9 continues to read as follows:

Authority: 7 U.S.C. 135 *et seq.*, 136–136y; 15 U.S.C. 2001, 2003, 2005, 2006, 2601–2671; 21 U.S.C. 331j, 346a, 348; 31 U.S.C. 9701; 33 U.S.C. 1251 *et seq.*, 1311, 1313d, 1314, 1321, 1326, 1330, 1344, 1345 (d) and (e), 1361; E.O. 11735, 38 FR 21243, 3 CFR, 1971–1975 Comp. p. 973; 42 U.S.C. 241, 242b, 243, 246, 300f, 300g, 300g–1, 300g–2, 300g–3, 300g–4, 300g–5, 300g–6, 300j–1, 300j–2, 300j–3, 300j–4, 300j–9, 1857 *et seq.*, 6901–6992k, 7401–7671q, 7542, 9601–9657, 11023, 11048.

2. Section 9.1 is amended by adding the new entries to the table to read as follows:

§ 9.1 OMB approvals under the Paperwork Reduction Act.

40 CFR Citation	OMB Control No.
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PART 124—PROCEDURES FOR DECISIONMAKING

124.31	2050-0149
124.32	2050-0149
124.33	2050-0149
PART 270—EPA-ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM	
270.62	2050-0149
270.66	2050-0149

40 CFR Citation

OMB Control No.

PART 124—PROCEDURES FOR DECISIONMAKING

1. The authority citation for part 124 continues to read as follows:

Authority: Resource Conservation and Recovery Act, 42 U.S.C. 6901 *et seq.*; Safe Drinking Water Act, 42 U.S.C. 300(f) *et seq.*; Clean Water Act, 33 U.S.C. 1251 *et seq.*; and Clean Air Act, 42 U.S.C. 1857 *et seq.*

2. Subpart B is amended by adding text to read as follows:

Subpart B—Specific Procedures Applicable to RCRA Permits

Sec.

124.31 Pre-application public notice and meeting.

124.32 Public notice requirements at the application stage.

124.33 Information repository.

Subpart B—Specific Procedure Applicable to RCRA Permits

§ 124.31 Pre-application public meeting and notice.

(a) *Applicability.* The requirements of this section shall apply to all RCRA part B applications seeking initial permits for hazardous waste management units over which EPA has permit issuance authority. The requirements of this section shall also apply to RCRA part B applications seeking renewal of permits for such units, where the renewal application is proposing a significant change in facility operations. For the purposes of this section, a "significant change" is any change that would qualify as a class 3 permit modification under 40 CFR 270.42. For the purposes of this section only, "hazardous waste management units over which EPA has permit issuance authority" refers to hazardous waste management units for which the State where the units are located has not been authorized to issue RCRA permits pursuant to 40 CFR part 271. The requirements of this section do not apply to permit modifications under 40 CFR 270.42 or to applications that are submitted for the sole purpose of conducting post-closure activities or post-closure activities and corrective action at a facility.

(b) Prior to the submission of a part B RCRA permit application for a facility, the applicant must hold at least one meeting with the public in order to solicit questions from the community and inform the community of proposed hazardous waste management activities. The applicant shall post a sign-in sheet or otherwise provide a voluntary

opportunity for attendees to provide their names and addresses.

(c) The applicant shall submit a summary of the meeting, along with the list of attendees and their addresses developed under paragraph (b) of this section, and copies of any written comments or materials submitted at the meeting, to the permitting agency as a part of the part B application, in accordance with 40 CFR 270.14(b).

(d) The applicant must provide public notice of the pre-application meeting at least 30 days prior to the meeting. The applicant must maintain, and provide to the permitting agency upon request, documentation of the notice.

(1) The applicant shall provide public notice in all of the following forms:

(i) *A newspaper advertisement.* The applicant shall publish a notice, fulfilling the requirements in paragraph (d)(2) of this section, in a newspaper of general circulation in the county or equivalent jurisdiction that hosts the proposed location of the facility. In addition, the Director shall instruct the applicant to publish the notice in newspapers of general circulation in adjacent counties or equivalent jurisdictions, where the Director determines that such publication is necessary to inform the affected public. The notice must be published as a display advertisement.

(ii) *A visible and accessible sign.* The applicant shall post a notice on a clearly marked sign at or near the facility, fulfilling the requirements in paragraph (d)(2) of this section. If the applicant places the sign on the facility property, then the sign must be large enough to be readable from the nearest point where the public would pass by the site.

(iii) *A broadcast media announcement.* The applicant shall broadcast a notice, fulfilling the requirements in paragraph (d)(2) of this section, at least once on at least one local radio station or television station. The applicant may employ another medium with prior approval of the Director.

(iv) *A notice to the permitting agency.* The applicant shall send a copy of the newspaper notice to the permitting agency and to the appropriate units of State and local government, in accordance with § 124.10(c)(1)(x).

(2) The notices required under paragraph (d)(1) of this section must include:

(i) The date, time, and location of the meeting;

(ii) A brief description of the purpose of the meeting;

(iii) A brief description of the facility and proposed operations, including the address or a map (e.g., a sketched or

copied street map) of the facility location;

(iv) A statement encouraging people to contact the facility at least 72 hours before the meeting if they need special access to participate in the meeting; and

(v) The name, address, and telephone number of a contact person for the applicant.

§ 124.32 Public notice requirements at the application stage.

(a) *Applicability.* The requirements of this section shall apply to all RCRA part B applications seeking initial permits for hazardous waste management units over which EPA has permit issuance authority. The requirements of this section shall also apply to RCRA part B applications seeking renewal of permits for such units under 40 CFR 270.51. For the purposes of this section only, "hazardous waste management units over which EPA has permit issuance authority" refers to hazardous waste management units for which the State where the units are located has not been authorized to issue RCRA permits pursuant to 40 CFR part 271. The requirements of this section do not apply to permit modifications under 40 CFR 270.42 or permit applications submitted for the sole purpose of conducting post-closure activities or post-closure activities and corrective action at a facility.

(b) *Notification at application submittal.*

(1) The Director shall provide public notice as set forth in § 124.10(c)(1)(ix), and notice to appropriate units of State and local government as set forth in § 124.10(c)(1)(x), that a part B permit application has been submitted to the Agency and is available for review.

(2) The notice shall be published within a reasonable period of time after the application is received by the Director. The notice must include:

(i) The name and telephone number of the applicant's contact person;

(ii) The name and telephone number of the permitting agency's contact office, and a mailing address to which information, opinions, and inquiries may be directed throughout the permit review process;

(iii) An address to which people can write in order to be put on the facility mailing list;

(iv) The location where copies of the permit application and any supporting documents can be viewed and copied;

(v) A brief description of the facility and proposed operations, including the address or a map (e.g., a sketched or copied street map) of the facility location on the front page of the notice; and

(vi) The date that the application was submitted.

(c) Concurrent with the notice required under § 124.32(b) of this subpart, the Director must place the permit application and any supporting documents in a location accessible to the public in the vicinity of the facility or at the permitting agency's office.

§ 124.33 Information repository.

(a) *Applicability.* The requirements of this section apply to all applications seeking RCRA permits for hazardous waste management units over which EPA has permit issuance authority. For the purposes of this section only, "hazardous waste management units over which EPA has permit issuance authority" refers to hazardous waste management units for which the State where the units are located has not been authorized to issue RCRA permits pursuant to 40 CFR part 271.

(b) The Director may assess the need, on a case-by-case basis, for an information repository. When assessing the need for an information repository, the Director shall consider a variety of factors, including: the level of public interest; the type of facility; the presence of an existing repository; and the proximity to the nearest copy of the administrative record. If the Director determines, at any time after submittal of a permit application, that there is a need for a repository, then the Director shall notify the facility that it must establish and maintain an information repository. (See 40 CFR 270.30(m) for similar provisions relating to the information repository during the life of a permit).

(c) The information repository shall contain all documents, reports, data, and information deemed necessary by the Director to fulfill the purposes for which the repository is established. The Director shall have the discretion to limit the contents of the repository.

(d) The information repository shall be located and maintained at a site chosen by the facility. If the Director finds the site unsuitable for the purposes and persons for which it was established, due to problems with the location, hours of availability, access, or other relevant considerations, then the Director shall specify a more appropriate site.

(e) The Director shall specify requirements for informing the public about the information repository. At a minimum, the Director shall require the facility to provide a written notice about the information repository to all individuals on the facility mailing list.

(f) The facility owner/operator shall be responsible for maintaining and

updating the repository with appropriate information throughout a time period specified by the Director. The Director may close the repository at his or her discretion, based on the factors in paragraph (b) of this section.

PART 270—EPA ADMINISTERED PERMIT PROGRAMS: THE HAZARDOUS WASTE PERMIT PROGRAM

1. The authority citation for part 270 continues to read as follows:

Authority: 42 U.S.C. 6905, 6912, 6924, 6925, 6927, 6939, and 6974.

2. Section 270.2 is amended by revising the definition for "Facility mailing list" to read as follows:

§ 270.2 Definitions.

Facility mailing list means the mailing list for a facility maintained by EPA in accordance with 40 CFR 124.10(c)(1)(ix).

3. Section 270.14 is amended by adding paragraph (b)(22) to read as follows:

§ 270.14 Contents of part B: General requirements.

(b) * * *

(22) A summary of the pre-application meeting, along with a list of attendees and their addresses, and copies of any written comments or materials submitted at the meeting, as required under § 124.31(c).

4. Section 270.30 is amended by adding paragraph (m) to read as follows:

§ 270.30 Conditions applicable to all permits.

* * *

(m) *Information repository.* The Director may require the permittee to establish and maintain an information repository at any time, based on the factors set forth in 40 CFR 124.33(b). The information repository will be governed by the provisions in 40 CFR 124.33(c) through (f).

5. Section 270.61(b)(5) introductory text is amended by removing the reference § 124.11(b) and adding in its place § 124.10(b).

6. In § 270.62, paragraphs (b)(6) through (10) are redesignated as paragraphs (b)(7) through (11), and new paragraph (b)(6) is added as follows:

§ 270.62 Hazardous waste incinerator permits.

* * *

(b) * * *

(6) The Director must send a notice to all persons on the facility mailing list as set forth in 40 CFR 124.10(c)(1)(ix) and to the appropriate units of State and local government as set forth in 40 CFR 124.10(c)(1)(x) announcing the scheduled commencement and completion dates for the trial burn. The applicant may not commence the trial burn until after the Director has issued such notice.

(i) This notice must be mailed within a reasonable time period before the scheduled trial burn. An additional notice is not required if the trial burn is delayed due to circumstances beyond the control of the facility or the permitting agency.

(ii) This notice must contain:

(A) The name and telephone number of the applicant's contact person;

(B) The name and telephone number of the permitting agency's contact office;

(C) The location where the approved trial burn plan and any supporting documents can be reviewed and copied; and

(D) An expected time period for commencement and completion of the trial burn.

7. Paragraph (d) of § 270.62 is revised as follows:

§ 270.62 Hazardous waste incinerator permits.

* * *

(d) For the purpose of determining feasibility of compliance with the performance standards of § 264.343 of this chapter and of determining adequate operating conditions under § 264.345 of this chapter, the applicant for a permit for an existing hazardous waste incinerator must prepare and submit a trial burn plan and perform a trial burn in accordance with § 270.19(b) and paragraphs (b)(2) through (b)(5) and (b)(7) through (b)(10) of this section or, instead, submit other information as specified in § 270.19(c). The Director must announce his or her intention to approve the trial burn plan in accordance with the timing and distribution requirements of paragraph (b)(6) of this section. The contents of the notice must include: the name and telephone number of a contact person at the facility; the name and telephone number of a contact office at the permitting agency; the location where the trial burn plan and any supporting documents can be reviewed and copied; and a schedule of the activities that are required prior to permit issuance, including the anticipated time schedule for agency approval of the plan and the time period during which the trial burn would be conducted. Applicants

submitting information under § 270.19(a) are exempt from compliance with 40 CFR 264.343 and 264.345 and, therefore, are exempt from the requirement to conduct a trial burn. Applicants who submit trial burn plans and receive approval before submission of a permit application must complete the trial burn and submit the results, specified in paragraph (b)(7) of this section, with part B of the permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Director to establish a later date for submission of the part B application or the trial burn results. Trial burn results must be submitted prior to issuance of the permit. When the applicant submits a trial burn plan with part B of the permit application, the Director will specify a time period prior to permit issuance in which the trial burn must be conducted and the results submitted.

8. In § 270.66, paragraphs (d) (3) through (5) are redesignated as paragraphs (d) (4) through (6), and new paragraph (d)(3) is added to read as follows:

§ 270.66 Permits for boilers and industrial furnaces burning hazardous waste.

* * *

(d) * * *

(3) The Director must send a notice to all persons on the facility mailing list as set forth in 40 CFR 124.10(c)(1)(ix) and to the appropriate units of State and local government as set forth in 40 CFR 124.10(c)(1)(x) announcing the scheduled commencement and completion dates for the trial burn. The applicant may not commence the trial burn until after the Director has issued such notice.

(i) This notice must be mailed within a reasonable time period before the trial burn. An additional notice is not required if the trial burn is delayed due to circumstances beyond the control of the facility or the permitting agency.

(ii) This notice must contain:

(A) The name and telephone number of applicant's contact person;

(B) The name and telephone number of the permitting agency contact office;

(C) The location where the approved trial burn plan and any supporting documents can be reviewed and copied; and

(D) An expected time period for commencement and completion of the trial burn.

9. Paragraph (g) of § 270.66 is revised as follows:

§ 270.66 Permits for boilers and industrial furnaces burning hazardous waste.

(g) *Interim status boilers and industrial furnaces.* For the purpose of determining feasibility of compliance with the performance standards of § 266.104 through 266.107 of this chapter and of determining adequate operating conditions under § 266.103 of this chapter, applicants owning or operating existing boilers or industrial furnaces operated under the interim status standards of § 266.103 of this chapter must either prepare and submit a trial burn plan and perform a trial burn in accordance with the requirements of this section or submit other information as specified in § 270.22(a)(6). The Director must announce his or her intention to approve of the trial burn plan in accordance with the timing and distribution requirements of paragraph (d)(3) of this section. The contents of the notice must include: the name and telephone number of a contact person at the facility; the name and telephone number of a contact office at the permitting agency; the location where the trial burn plan and any supporting documents can be reviewed and copied; and a schedule of the activities that are required prior to permit issuance, including the anticipated time schedule for agency approval of the plan and the time periods during which the trial burn would be conducted. Applicants who submit a trial burn plan and receive approval before submission of the part B permit application must complete the trial burn and submit the results specified in paragraph (f) of this section with the part B permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Director to establish a later date for submission of the part B application or the trial burn results. If the applicant submits a trial burn plan with part B of the permit application, the trial burn must be conducted and the results submitted within a time period prior to permit issuance to be specified by the Director.

[FR Doc. 95-29896 Filed 12-8-95; 8:45 am]

BILLING CODE 5560-60-P

40 CFR Part 52

[SC-029-1-7177a; FRL-6316-5]

Approval and Promulgation of Implementation Plans: Approval of Revisions to the South Carolina State Implementation Plan (SIP)

AGENCY: Environmental Protection Agency (EPA).

ACTION: Direct final rule.

SUMMARY: EPA is approving a revision to the South Carolina State Implementation Plan (SIP) to incorporate new permitting regulations and to allow the State of South Carolina to issue Federally enforceable state construction and operating permits (FESCOP). On July 12, 1995, the State of South Carolina through the Department of Health and Environmental Control (DHEC) submitted a SIP revision which updates the procedural rules governing the issuance of air permits in South Carolina and fulfills the requirements necessary for a state FESCOP program to become Federally enforceable. In order to extend the Federal enforceability of South Carolina's FESCOP program to hazardous air pollutants (HAPs), EPA is also approving South Carolina's FESCOP program pursuant to section 112 of the Clean Air Act as amended in 1990 (CAA) so that South Carolina may issue Federally enforceable construction and operating permits for HAPs.

DATES: This final rule will be effective February 11, 1996, unless adverse or critical comments are received by January 10, 1996. If the effective date is delayed, timely notice will be published in the Federal Register.

ADDRESSES: Written comments should be addressed to Scott Miller at the EPA Regional office listed below. Copies of the documents relative to this action are available for public inspection during normal business hours at the following locations. The interested persons wanting to examine these documents should make an appointment with the appropriate office at least 24 hours before the visiting day.

Air and Radiation Docket and Information Center (Air Docket 6102), U.S. Environmental Protection Agency, 401 M Street SW., Washington, DC 20460.

Environmental Protection Agency, Region 4 Air Programs Branch, 345 Courtland Street NE., Atlanta, Georgia 30365.

South Carolina Department of Health and Environmental Control, 2600 Bull Street, Columbia, South Carolina 29201.

FOR FURTHER INFORMATION CONTACT:

Scott Miller, Air Programs Branch, Air, Pesticides & Toxics Management Division, Region 4 Environmental Protection Agency, 345 Courtland Street NE., Atlanta, Georgia 30365. The telephone number is (404) 347-3555 extension 4153. Reference file SC029.

SUPPLEMENTARY INFORMATION: On July 12, 1995, the State of South Carolina through the DHEC submitted a SIP revision designed to allow South Carolina to issue FESCOP which conform to EPA requirements for Federal enforceability as specified in a Federal Register notice, "Requirements for the preparation, adoption, and submittal of implementation plans; air quality, new source review; final rules." (See 54 FR 22274, June 28, 1989). This voluntary SIP revision allows EPA and citizens under the Act to enforce terms and conditions of state-issued minor source construction and operating permits. Construction and operating permits that are issued under the State's minor source construction and operating permit program that is approved into the State SIP and under section 112(l) will provide Federally enforceable limits to an air pollution source's potential to emit. Limiting of a source's potential to emit through Federally enforceable construction and operating permits can affect a source's applicability to Federal regulations such as title V operating permits, New Source Review (NSR) preconstruction permits, Prevention of Significant Deterioration (PSD) preconstruction permits for criteria pollutants and Federal air toxics requirements. EPA notes that the State will continue to issue construction and operating permits that are not intended to be Federally enforceable under regulations found at South Carolina Air Pollution Control Regulation (SCAPCR) 61-62.1 Section II.A and Section II.B.

In the aforementioned June 28, 1989, Federal Register document, EPA listed five criteria necessary to make a state agency's minor source construction and operating permit program Federally enforceable and, therefore, approvable into the SIP. This revision satisfies the five criteria for Federal enforceability of the State's minor source construction and operating permit program.

The first criterion for a State's construction and operating permit program to become Federally enforceable is EPA's approval of the permit program into the SIP. On July 12, 1995, the State of South Carolina submitted through the DHEC a SIP revision designed to meet the five criteria for Federal enforceability. This action will approve these regulations

TITLE 47
LEGISLATIVE RULES
DIVISION OF ENVIRONMENTAL PROTECTION
WATER RESOURCES - WASTE MANAGEMENT

SERIES 35
HAZARDOUS WASTE MANAGEMENT RULE

§ 47-35-1. SCOPE AND AUTHORITY.

1.1. **Scope and Purpose.** -- The purpose of this rule is to provide for the regulation of the generation, treatment, storage, and disposal of hazardous waste to the extent necessary for the protection of the public health and safety and the environment.

1.2. **Authority.** -- This rule is promulgated pursuant to the West Virginia Hazardous Waste Management Act, W. Va. Code, § 22-18-1, et seq.

1.3. **Filing Date.** -- April 11, 1996.

1.4. **Effective Date.** -- June 1, 1996.

1.5. **Amendment of Former Rule.** -- This rule amends the Hazardous Waste Management Regulations, 47 CSR 35, in effect prior to the date this rule becomes effective.

1.6. **Incorporation by Reference.** -- Whenever either federal statutes or regulations or state statutes or rules are incorporated by reference into this rule, the reference is to that statute or regulation in effect on July 1, 1995, unless otherwise noted in the text of this rule. This incorporation by reference is not intended to replace or abrogate federal authorities granted the Resource Conservation and Recovery Act of 1976.

1.6.a. In applying the federal requirements incorporated by reference throughout this rule, the following exceptions or substitutions apply, unless the context clearly requires otherwise or the referenced rule cannot be delegated to the state:

1.6.a.1. "Office of waste management, West Virginia division of environmental protection" shall be substituted for "environmental protection agency."

1.6.a.2. "Chief of the office of waste management, West Virginia division of environmental protection" shall be substituted

for "administrator," "regional administrator," and "director." In those sections that are not adopted by reference or that are not delegable to the state, "administrator", "regional administrator", and "director" shall have the meaning defined in 40 CFR 260.10.

1.6.a.3. Whenever the regulations require publication in the "Federal Register" compliance shall be accomplished by publication in the "West Virginia Register," a part of the "State Register" created pursuant to the provisions of W. Va. Code, § 29A-2-2 for those areas applicable and delegable to the state.

1.6.a.4. Whenever in the federal regulation reference is made to the Resource Conservation and Recovery Act of 1976 § 3010, as amended (42 U.S.C. § 6930), the reference should be to section 4 of this rule. The notification requirements of the Resource Conservation and Recovery Act of 1976 §§ 3010 remain in effect and will be satisfied by compliance with section 4 of this rule.

1.7. **Cross Reference.** -- Whenever a reference is cited in a provision incorporated by reference which cross reference was not incorporated by reference, the provisions of the applicable state law and rules, if any, control to the extent of any conflict or inconsistency. Where state rules are present and there is a question, the state rules govern. Where there are no state regulations present, federal regulations govern. For example, cross reference to 40 CFR part 264 subpart O -- Incinerators, which was not incorporated by reference, would need to be referenced to the applicable West Virginia air quality board rule on incineration of hazardous waste, 45 CSR 25.

1.8. **Inconsistencies with the West Virginia Code.** -- In the event a provision of the code of federal regulations incorporated by reference herein includes a section which is inconsistent with the West Virginia Code, the West Virginia Code controls to the extent federal law does not preempt the state law. In the event a provision of the code of federal regulations incorporated by reference herein is beyond the scope of authority granted the division of environmental protection pursuant to statute, or is in excess of the statutory authority, such provision shall be and remain effective only to the extent authorized by the West Virginia Code.

1.9. **Provisions Applied Prospectively.** -- The provisions of this rule are to be applied prospectively. All orders, determinations, demonstrations, rules, permits, certificates, licenses, waivers, bonds, authorizations and privileges which have been issued, made, granted, approved or allowed to become effective by the chief, and which are in effect on the date this rule becomes effective, shall continue in effect according to their terms unless modified, suspended or revoked in accordance with the law.

§ 47-35-2. HAZARDOUS WASTE MANAGEMENT SYSTEM: GENERAL.

2.1. 40 CFR Part 260. -- The provisions of 40 CFR part 260 are hereby adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

2.1.a. The definitions of terms used in this rule shall have the meaning ascribed to them in 40 CFR parts 260, 261, 262, 263, 264, 265, 266, 267, 268, 270, 273 and 279 with the exceptions, modifications and additions set forth in this section.

2.1.a.1. "Major facility" means a disposal or treatment facility which disposes or treats an amount of hazardous waste exceeding or equal to one thousand (1000) tons during a calendar year, and any storage facility having a storage capacity for one thousand (1000) tons of hazardous waste or more.

2.1.a.2. "Full regulation" means those rules applicable to generators of greater than one thousand (1000) kilograms of non-acutely hazardous waste in a calendar month and/or who treat, store or dispose of hazardous waste at their facility.

2.1.a.3. "Mercury containing lamp" means an electric lamp in which mercury is purposely introduced by the manufacturer for the operation of the lamp. Mercury containing lamps commonly include florescent lamps.

2.1.a.4. "Universal Waste" means any of the following hazardous wastes that are managed under the universal waste requirements of 40 CFR part 273:

- (1) Batteries as described in 40 CFR § 273.2;
- (2) Pesticides as described in 40 CFR § 273.3; and
- (3) Thermostats and mercury containing lamps as described in 40 CFR § 273.4.

2.2. 40 CFR § 260.2. -- The provisions of 40 CFR § 260.2 are excepted from incorporation by reference. Availability of information provided under these rules is controlled by the provisions of W. Va. Code, §22-18-12.

2.3. 40 CFR §§ 260.21(d) and 260.23. -- The provisions of 40 CFR § 260.21(d) and 40 CFR § 260.23 are excepted from incorporation by reference.

2.4. Petitions for Waste Exclusions.

2.4.a. Persons desiring to exclude a waste at a particular generating facility from the lists set forth in 40 CFR part 261 may petition the chief for such an exclusion after having received approval from the administrator of the environmental protection agency. The petition shall include:

2.4.a.1. A copy of the petition submitted to the administrator of the environmental protection agency pursuant to 40 CFR § 260.22, including all demonstration information;

2.4.a.2. A copy of the administrator's approval granting the exclusion pursuant to 40 CFR § 260.20(d); and

2.4.a.3. Any other additional information which may be required for the chief to evaluate the petition.

2.4.b. Within one hundred and twenty (120) days of the filing of the petition the chief shall decide whether to approve or to deny the petition and so advise the petitioner. Where a decision to deny a petition is made, the chief shall notify the petitioner of such action in writing, setting forth the reasons therefor.

2.4.c. The chief shall not deny a petition to exclude a waste at a particular facility that has been approved by the administrator unless scientifically supportable reasons for such denial are advanced which had not been presented to the administrator.

2.5. Petitions to amend the regulations to include additional wastes as universal wastes.

2.5.a. Persons desiring to include a waste as a universal waste may petition the chief for such an exclusion after having received approval from the administrator of the environmental protection agency. The petition shall include:

2.5.a.1. A copy of the petition submitted to the administrator of the environmental protection agency pursuant to 40 CFR § 260.23, including all demonstration information;

2.5.a.2. A copy of the administrator's approval granting the exclusion pursuant to 40 CFR § 260.20 and 40 CFR part 273; and

2.5.a.3. Any other additional information which may be required for the chief to evaluate the petition.

2.5.b. Within one hundred and twenty (120) days of the filing of the petition the chief shall decide whether to approve or to deny the petition and so advise the petitioner. Where a decision to deny a petition is made, the chief shall notify the petitioner of such action in writing, setting forth the reasons therefor.

2.5.c. The chief shall not deny a petition to include a waste as an universal waste that has been approved by the administrator unless scientifically supportable reasons for such denial are advanced which had not been presented to the administrator.

2.5.d. Any person may petition the Chief to include a waste as a universal waste as follows:

2.5.d.1. Submit a petition to the Chief demonstrating that the regulation under the universal waste regulations of 40 CFR part 273 is appropriate for the waste or category of waste; will improve management practices for the waste or category of waste; and will improve implementation of the hazardous waste program. The petition should also include information required by 40 CFR § 260.20(b), and include as many of the factors listed in 40 CFR § 273.81 as are appropriate for the waste or category of waste addressed in the petition.

2.5.d.2. The Chief will grant or deny a petition using the factors listed in 40 CFR § 273.81. The decision will be based on the weight of evidence showing that regulation under 40 CFR part 273 is appropriate for the waste or category of waste, will improve management practices for the waste or category of waste, and will improve implementation of the hazardous waste program.

2.5.d.3. The decision of the Chief shall be in writing and state the reasons to either grant or deny the petition. Any petitioner aggrieved by the decision of the Chief may appeal the decision to the Environmental Quality Board in accordance with the provisions of W.Va. Code § 22-18-20.

§ 47-35-3. IDENTIFICATION AND LISTING OF HAZARDOUS WASTE.

3.1. 40 CFR 261. -- The provisions of 40 CFR part 261 are hereby adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

3.1.a. In order for a mixture of a waste and one or more hazardous wastes identified in 40 CFR §§ 261.3(a)(2)(iv) to be exempt from the definition of hazardous waste, the owner or operator must comply with the following:

3.1.a.1. Provide a certification in writing to the chief that groundwater monitoring complying with either 40 CFR part 265, subpart F or which is approved by the chief, is or will be in place at the wastewater treatment facility identified in 40 CFR § 261.3(a)(2)(iv). A time schedule for the installation of such groundwater monitoring must be included. This requirement does not apply to wastewater treatment units or containers.

3.1.a.2. Before claiming an exemption, the owner or operator of each wastewater treatment facility receiving mixtures of wastes under 40 CFR § 261.3(a)(2)(iv) shall notify the chief of the receipt of such wastes on a form prescribed by the chief.

3.1.a.3. Annually submit to the chief a list of hazardous wastes that are expected to be present in the mixture to be exempted.

3.2. The provisions of 40 CFR § 261.5 (f)(3)(iv) and (g)(3)(iv) are excepted from incorporation by reference. Small quantity generators and conditionally exempt small quantity generators that are in compliance with Appendix 1 of this rule are deemed in compliance with 40 CFR § 261.5 and other requirements of this rule applicable to small quantity and conditionally exempt small quantity generators. Conditionally exempt small quantity generators shall notify the chief of their hazardous waste activity in accordance with Section 4 of this rule.

3.3. The provisions of 40 CFR § 261.9 are amended by revising 40 CFR § 261.9(c) to read as follows:

(c) Thermostats and mercury containing lamps as described in 40 CFR § 273.4.

§ 47-35-4. NOTIFICATION OF HAZARDOUS WASTE ACTIVITY REGULATIONS.

4.1. **Applicability.** Any person that engages in a hazardous waste activity in the State of West Virginia shall notify the chief of these activities when he begins such activity, unless such activities are exempted from the requirements of these rules.

4.1.a. Any person as described in subsection 4.1 of these rules that has notified the EPA or is subject to the requirements to notify EPA as specified in volume 45, number 39 of the Federal Register, dated February 26, 1980, pages 12746 through 12754, is subject to the provision of section 4 of these rules.

4.1.b. The purpose of section 4 of these rules is to provide a means for the State of West Virginia to utilize the information provided by all who complied with the notification requirements of EPA as described in subdivision 4.1.a. of these rules or all who initiated hazardous waste activities subsequent to the requirements of EPA as referenced above in subdivision 4.1.a of these rules to notify the chief of their hazardous waste activities.

4.2. **Notification.** Any person that notified EPA of hazardous waste activities as referenced above in subsection 4.1 of these rules shall provide a copy of that notification to the chief.

4.2.a. Any person involved in hazardous waste activities that did not comply with the notification requirements of EPA, as referenced above in subsection 4.1 of the rules, but is subject to those requirements shall notify the chief in writing of his hazardous waste activities within thirty (30) days of the effective date of these rules. Notification may be accomplished by the use

of EPA Form 8700-12 or the provision of the same information in any other manner selected by the notifier.

4.2.b. Any person exempted from the federal notification requirements as specified in 40 CFR §§ 261.6(b) and 261.5, but subject to West Virginia notification requirements, shall notify the chief in writing of his hazardous waste activities within ninety (90) days of the effective date of these rules or the date of initiation of such activities, whichever is later. Notification may be accomplished by use of EPA Form 8700-12 or the provision of the same information in any other manner selected by the notifier.

4.2.c. One notification form is required for each generator.

4.2.d. A notification form is required for each storage, treatment, disposal, or other facility. However, if one facility site includes more than one storage, treatment, or disposal activity, only one notification form for the entire facility site is required.

4.2.e. Generators that store, treat, or dispose of hazardous waste on-site shall file a notification form for generation activities as well as storage, treatment, and disposal activities, unless such activities are exempted from the requirements of these rules.

4.2.f. New generators and those initiating activities subsequent to the EPA notification period referenced in subdivision 4.1.a. of these rules shall comply with the EPA identification number requirements and shall provide a copy of their application for an EPA identification number to the administrator.

§ 47-35-5. STANDARDS APPLICABLE TO GENERATORS OF HAZARDOUS WASTE.

5.1. 40 CFR Part 262. -- The provisions of 40 CFR part 262 are hereby adopted and incorporated by reference with the modifications, exceptions and additions contained in this section.

5.2. 40 CFR § 262.10(e). -- The provisions of 40 CFR § 262.10(e) shall be excepted from incorporation.

5.2.a. A person who generates a hazardous waste as defined by 40 CFR part 261 is subject to the compliance requirements and penalties prescribed in W. Va. Code, §22-18-1 et seq. if he does not comply with the requirements of this rule. This rule no way abrogates the enforcement authority of the Resource Conservation and Recovery Act of 1976 § 3008.

5.2.b. All references to 40 CFR § 262.10(e) shall be deemed references to subsection 5.2 and the subdivisions herein, as appropriate.

5.3. 40 CFR Part 262, Subpart E. -- The provisions of 40 CFR part 262, subpart E -- Exports of Hazardous Waste are excepted from incorporation by reference and shall remain the provenance of the environmental protection agency and in addition to the requirements contained therein, any person subject to the provisions of subpart E shall file with the chief copies of all documentation, manifests, exception reports, annual reports or records, inter alia, submitted to EPA, the administrator or the regional administrator as required by and within the timeframes set forth in subpart E.

5.4. 40 CFR Part 262, Subpart F. -- The provisions of 40 CFR part 262, subpart F -- Imports of Hazardous Waste are excepted from incorporation by reference and in addition to the requirements contained therein, any person subject to the provisions of subpart F shall file with the chief copies of all documentation, manifests, exception reports, annual reports or records, inter alia, submitted to EPA, the administrator or the regional administrator as required by and within the timeframes set forth in subpart F.

§47-35-6. STANDARDS APPLICABLE TO TRANSPORTERS OF HAZARDOUS WASTE.

6.1. 40 CFR Part 263. -- The provisions of 40 CFR part 263 are hereby adopted and incorporated by reference insofar as said regulations relate to the transportation of hazardous waste by air and water.

6.2. Note. -- The use of railroads for the transportation of hazardous waste is regulated by the West Virginia public service commission rules, "Rules and Regulations Governing the Transportation of Hazardous Waste by Rail", 150 CSR 11. The use of the state highways for the transportation of hazardous waste is regulated under the West Virginia division of highways, "Transportation of Hazardous Wastes Upon the Roads and Highways", 157 CSR 7.

§ 47-35-7. STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES.

7.1. Rules of the Air Quality Board, 45 CSR 35, -- The standards in Section 7 of these regulations apply to owners and operators of all facilities which treat, store, or dispose of hazardous waste except as otherwise provided by law. In addition to the standards in section 7 of these rules, the rules of the air quality board, 45 CSR 25, apply to management facilities which may emit hazardous waste or the constituents thereof to the atmosphere including incineration facilities except as otherwise provided by law. For purposes of section 7 of these rules, the following persons are considered to be incinerating hazardous waste:

7.1.a. Owners or operators of hazardous waste incinerators;
and

7.1.b. Owners or operators of boilers or industrial furnaces used to destroy wastes.

7.2. 40 CFR Part 264. -- The provisions of 40 CFR part 264 are hereby adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

7.3. 40 CFR § 264.1 -- The provisions of 40 CFR § 264.1(g)(11)(iii) are amended to read as follows:

(iii) Thermostats and mercury containing lamps as described in 40 CFR § 273.4

7.4. Required Receipt of Identical Notification. -- The provisions of 40 CFR part 264.12(a) are retained by the environmental protection agency; however, the chief of the office of waste management must receive identical notification.

7.5. Releases from Solid Waste Management Unit. -- The provisions of 40 CFR part 264, subpart F -- Releases from solid waste management units are incorporated by reference with the following modifications, exceptions and additions.

7.5.a. For purposes of 40 CFR § 264.92, reference to the "regional administrator" shall be to the "environmental quality board." The environmental quality board establishes ground-water protection standards pursuant to the authority granted the board in W. Va. Code, § 22-12-4.

7.5.b. For purposes of 40 CFR § 264.94 and subparagraphs thereof, the environmental quality board rule on groundwater protection standards, 46 CSR 12 and the subparagraphs therein, shall apply as required except as noted below pursuant to the authority granted the environmental quality board in W. Va. Code, § 22-12-4.

7.5.b.1. For the purposes of 40 CFR part 264.94(a)(1), the groundwater protection standards at 46 CSR 7 shall apply.

7.5.c. The provisions of 40 CFR § 264.99(g) are incorporated by reference with the following modifications:

7.5.c.1. The chief will specify in the facility permit the frequencies for collecting samples required under 40 CFR § 264.99(g). This frequency shall not be less than once every five years.

7.6. Financial Requirement. -- The provisions of 40 CFR part 264, subpart H -- Financial Requirements are adopted and incorporated by reference with the following modifications:

7.6.a. The provisions of 40 CFR §§ 264.149 and 264.150 are excepted from incorporation by reference.

7.7. Provisions Relating to Incinerators. -- The provisions of 40 CFR §§ 264.343, 264.344, 264.345 and 264.347 relating to incinerators are excepted from incorporation by reference. Consult the regulations of the air quality board regarding emissions from incinerators.

7.7.a. Consult the air quality board regulations, 45 CSR 25, "Regulations to Prevent & Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities".

7.8. 40 CFR Part 264, Subparts AA, BB, CC. -- The provisions of 40 CFR part 264, subparts AA, BB, and CC are excepted from incorporation by reference. Consult the regulations of the air quality board regarding emissions from incinerators.

§ 47-35-8. INTERIM STATUS STANDARDS FOR OWNERS AND OPERATORS OF HAZARDOUS WASTE TREATMENT, STORAGE, AND DISPOSAL FACILITIES.

8.1. 40 CFR 265. -- The provisions of 40 CFR part 265 are adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

8.2. 40 CFR § 265.1 -- The provisions of 40 CFR § 265.1(c)(14)(iii) are amended to read as follows:

(iii) Thermostats and mercury containing lamps as described in 40 CFR § 273.4.

8.3. 40 CFR §§ 265.12(a), 265.149 and 265.150. -- The provisions of 40 CFR 265.12(a), 265.149, and 265.150 are excepted from incorporation by reference.

8.4. 40 CFR §§ 265.345, 265.347, 265.352. -- The provisions of 40 CFR §§ 265.345, 265.347 and 265.352 relating to incinerators are excepted from incorporation by reference. Consult the rules of the air quality board regarding emissions from incinerators.

8.5. Thermal Treatment. -- The provisions of 40 CFR part 265, subpart P -- Thermal Treatment are incorporated by reference except for 40 CFR § 265.383 which is excepted from incorporation by reference. Consult the rules of the air quality board regarding emissions from thermal treatment units.

8.6. 40 CFR Part 265 Subparts AA, BB, CC. -- The provisions of 40 CFR part 265, subparts AA, BB, and CC are excepted from incorporation by reference. Consult the rules of the air quality board regarding air emission standards for process vents and air emissions standards for equipment leaks.

§ 47-35-9. STANDARDS FOR THE MANAGEMENT OF SPECIFIC HAZARDOUS WASTES AND SPECIFIC TYPES OF HAZARDOUS WASTE MANAGEMENT FACILITIES.

9.1. 40 CFR Part 266. -- The provisions of 40 CFR part 266 are hereby adopted and incorporated by reference. Consult the rules of the air quality board regarding Subpart H of this part.

§ 47-35-10. LAND DISPOSAL RESTRICTIONS.

10.1. 40 CFR 268. -- The provisions of 40 CFR part 268 are hereby adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

10.2. 40 CFR 268.1 -- The provisions of 40 CFR § 268.1(f)(3) are amended to read as follows:

(3) Thermostats and mercury containing lamps as described in 40 CFR § 273.4

10.3. 40 CFR §§ 268.5, 268.6, 268.10 - .13, 268.42(b) and 268.44. -- The provisions of 40 CFR §§ 268.5, 268.6, 268.10, 268.11, 268.12, 268.13, 268.42(b) and 268.44 are excepted from incorporation by reference.

10.4. Definition of Administrator in 40 CFR Part 268.40(b). The term "administrator" in 40 CFR part 268.40(b) shall retain its meaning as defined in 260.10.

§ 47-35-11. THE HAZARDOUS WASTE PERMIT PROGRAM.

11.1. 40 CFR Part 270. -- The provisions of 40 CFR part 270 are hereby adopted and incorporated by reference with the modifications, exceptions and additions set forth in this section.

11.2. 40 CFR § 270.1 -- The provisions of 40 CFR § 270.1(c)(2)(viii)(C) are amended to read as follows:

(c) Thermostats and mercury containing lamps as described in 40 CFR § 273.4.

11.3. 40 CFR 270.2 Definitions

11.3.a. Definition of "RCRA Permit". -- For purposes of this section, the term "RCRA permit" means "West Virginia hazardous waste management permit." The following additional requirements shall apply to obtain a hazardous waste permit in West Virginia. All references in 40 CFR part 124 to 40 CFR part 270 shall be deemed to be references to the applicable provisions of subsections 11.4 through 11.14 of this rule. To the extent of any inconsistency with 40 CFR part 270, the specific provisions contained herein shall control.

11.3.b. Definition of "Major Facility". -- The term "major facility" shall have the meaning given at paragraph 2.1.a.1. of this rule.

11.4. Application Fees.

11.4.a. Any person who applies for a permit for the construction or operation of a hazardous waste management facility, or both, shall submit as part of said application a money order or cashier's check payable to "The Hazardous Waste Management Fund" of the state treasury. Persons required to obtain a permit-by-rule pursuant to these regulations are not required to pay a permit application fee.

11.4.b. Such fee shall be determined by the schedule set forth in table I of these rules. If the cumulative total of application fees imposed under this section equals or exceeds fifty thousand dollars (\$50,000) then the person required to pay the fees may, at the person's option, elect to submit the fee payments in installments over a three year period. The installments submitted to the Division of Environmental Protection may not be less frequent than annually and the amount submitted annually may not be less than one-third of the total amount due.

11.4.c. The chief reserves the right to promulgate rules establishing a permit renewal fee at a later date.

11.5. Draft Permits.

11.5.a. Once an application is complete, the chief shall tentatively decide whether to prepare a draft permit or to deny the application.

11.5.b. If the chief decides to prepare a draft permit, a draft permit shall be prepared that contains the following information:

11.5.b.1. All conditions under 40 CFR §§ 270.30 and 270.32;

11.5.b.2. All compliance schedules under 40 CFR § 270.33;

11.5.b.3. All monitoring requirements under 40 CFR § 270.31; and

11.5.b.4. Standards for treatment, storage, and disposal and other permit conditions under 40 CFR part 270.

11.5.c. A fact sheet prepared in accordance with subsection 11.6 of these rules shall accompany the draft permit.

11.5.d. Any additional information considered to be necessary or proper.

11.6. Fact Sheet.

11.6.a. A fact sheet shall be prepared by the chief for every draft permit for each hazardous waste management facility or activity. The fact sheet shall briefly set forth the principal facts and the significant factual, legal, methodological, and policy questions considered in preparing the draft permit. The chief shall send this fact sheet to the applicant and, upon request, to any other person.

11.6.b. The fact sheet shall include, when applicable:

11.6.b.1. A brief description of the type of facility or activity which is the subject of the draft permit;

11.6.b.2. The type and quantity of wastes, fluids, or pollutants which are proposed to be or are being treated, stored, disposed of, injected, emitted, or discharged. A description of the type of wastes, fluids, or pollutants shall include, but not limited to, the characteristics of the waste materials and the potential effects on public health and the environment;

11.6.b.3. A brief summary of the basis for the draft permit conditions including references to applicable statutory or rule provisions;

11.6.b.4. Reasons why any requested variances or alternatives to required standards do or do not appear justified;

11.6.b.5. A description of the procedures for reaching a final decision on the draft permit including:

11.6.b.5.A. The beginning and ending dates of the comment period and the address where comments will be received;

11.6.b.5.B. Procedures for requesting a hearing and the nature of that hearing; and

11.6.b.5.C. Any other procedures by which the public may participate in the final decision; and

11.6.b.6. Name and telephone number of a person to contact for additional information.

11.7. Public Access to Information.

11.7.a. Any records, reports, or information and any permit, permit applications, and related documentation within the chief's possession shall be available to the public for inspection and

copying; provided, however, that upon a satisfactory showing to the chief that such records, reports, permit documentation, or information, or any part hereof would, if made public, divulge methods or processes or activities entitled to protection as trade secrets, the chief shall consider, treat, and protect such records as confidential.

11.7.b. It shall be the responsibility of the person claiming any information as confidential under the provisions of subsection 11.7. of these rules to clearly mark each page containing such information with the word "CONFIDENTIAL" and to submit an affidavit setting forth the reasons that said person believes that such information is entitled to protection.

11.7.c. Any document submitted to the chief which contains information for which claim of confidential information is made shall be submitted in a sealed envelope marked "CONFIDENTIAL" and addressed to the chief. The document shall be submitted in two (2) separate parts. The first part shall contain all information which is not deemed by the person preparing the report as confidential and shall include appropriate cross-references to the second part which contains data, words, phrases, paragraphs, or pages and appropriate affidavits containing or relating to information which is claimed to be confidential.

11.7.d. No information shall be protected as confidential information by the chief unless it is submitted in accordance with the provisions of subdivision 11.7.c. of these rules and no information which is submitted in accordance with the provisions of subdivision 11.7.c. of these rules shall be afforded protection as confidential information unless the chief finds that such protection is necessary to protect trade secrets. The person who submits information claimed to be confidential shall receive written notice from the chief as to whether the information has been accepted as confidential or not.

11.7.e. All information which meets the tests of subdivision 11.7.d. of these rules shall be marked with the term "ACCEPTED" and shall be protected as confidential information. If said person fails to satisfactorily demonstrate to the chief that such information in the form presented to him meets the criteria of subsection 11.7.d. of these rules, the chief shall mark the information "REJECTED" and promptly return such information to the person submitting such information.

11.7.f. Nothing contained herein shall be construed so as to restrict the release of relevant confidential information during situations declared to be emergencies by the chief or his designee.

11.7.g. Nothing in subsection 11.7. of these rules may be construed as limiting the disclosure of information by the division to any officer, employee, or authorized representative of the State

or federal government concerned with effecting the purposes of subsection 11.7. of these rules.

11.7.h. Persons interested in obtaining information pursuant to subsection 11.7. of these rules should submit a request in accordance with Title 46, Water Resources Board, Series 8 (46 C.S.R. 8).

11.7.i. Claims of confidentiality for the name and address of any permit applicant or permittee will be denied.

11.8. Public Participation in Permit Process.

11.8.a. Public notice shall be given that the following actions have occurred:

11.8.a.1. A draft permit has been prepared; or

11.8.a.2. A hearing has been scheduled.

11.8.b. Timing. Public notice of the preparation of a draft permit required under subsection 11.8. of these rules shall allow at least forty-five (45) days for public comment.

11.8.c. Public notice of a public hearing shall be given at least thirty (30) days before the hearing.

11.8.d. Methods. Public notice of activities described in subsection 11.8. of these rules shall be given by the following methods:

11.8.e. By mailing a copy of the notice to the following persons:

11.8.e.1. The applicant;

11.8.e.2. Any federal or state agency which the chief knows has issued or is required to issue a RCRA, UIC, PSD, NPDES or 404 permit for the facility or activity including, but not limited to, the U.S. environmental protection agency and the U.S. army corps of engineers;

11.8.e.3. Each state agency having authority under state law with responsibility to the construction or operation of such facility;

11.8.e.4. Any unit of local government having jurisdiction over the area where the facility is proposed to be located;

11.8.e.5. Other appropriate federal or state agencies including, but not limited to, the U.S. fish and wildlife service,

the U.S. forest service, the West Virginia department of culture and history, the West Virginia department of health, other governmental authorities including any affected states, and the Advisory Council on Historic Preservation (Suite 430, 1522 K Street, N.W., Washington, D.C. 20005); and

11.8.e.6. All persons to whom a public notice is sent;

11.8.e.7. Persons on the mailing list developed
by:

11.8.e.7.A. Including those who request in writing to be on the list.

11.8.e.7.B. Soliciting persons for "area lists" from participants in past permit proceedings in that area.

11.8.e.7.C. Notifying the public of the opportunity to be put on the mailing list through periodic publication in the public press and in appropriate publications of the state. The chief may update the mailing list by requesting written indication of continued interest from those listed. The chief may delete from the list the name of any person who fails to respond to such a request.

11.8.e.8. By publishing the public notice, in the form of a class I legal advertisement in a qualified daily or weekly newspaper of general circulation and broadcasting the public notice over local radio stations in the area in which the facility is or is proposed to be located. A qualified daily or weekly newspaper is, for the purpose of subsection 11.8. of these rules, any newspaper which meets the provisions of W. Va. Code, § 59-3-1(b).

11.8.e.9. By any other method reasonably calculated to give actual notice of the action in question to the person potentially affected by it, including press releases or any other forum of medium to elicit public participation.

11.8.e.10. Any person otherwise entitled to receive notice under subsection 11.8. of these rules may waive the right to receive notice for any classes and categories of permits.

11.9. Personal Notification by Facility Owner or Operator to Individual Residents.

11.9.a. Following the submittal of a Part B application which is deemed complete by the chief, and before the public notice of the preparation of a draft permit as required under subsection 11.8. of these rules, the facility owner or operator shall serve notice upon the residence of all persons residing within one-quarter mile of the boundaries of the specific hazardous waste management facility.

11.9.b. Service of such notice as herein provided shall be made by delivering a copy to the residence of each person upon whom service must be made or by mailing it by registered mail to the last known address of each person or by such other reasonable means as the chief and the owner or operator agree will provide an effective and practical method of notification.

11.9.c. Following completion of service of notice as set forth herein, and no later than the date of public notice required in subsection 11.8. of these rules, the owner or operator shall certify in writing to the chief that service has been completed, describe the method of service, and provide a copy of the written notice employed to the chief.

11.9.d. The personal notice required herein shall be a written notice containing at a minimum:

11.9.d.1. The name and address of the permit applicant;

11.9.d.2. The name, location, and type of hazardous waste management facility for which the application has been submitted;

11.9.d.3. A statement advising the recipients of the notice that a complete application for permit has been submitted; and

11.9.d.4. A statement advising the notice recipients that an opportunity for public comment upon the application and draft permit will be made available to them upon completion of division review of the application and that such notice will be published as a legal advertisement in a local newspaper and broadcast over the radio.

11.10. Contents.

11.10.a. All public notices issued under subsection 11.8. of these rules shall contain the following information:

11.10.a.1. Name and address of the office processing the permit action for which notice is being given;

11.10.a.2. Name and address of the permittee or permit applicant and, if different, of the facility or activity regulated by the permit;

11.10.a.3. A brief description of the business conducted at the facility described in the permit application or the draft permit;

11.10.a.4. The name, address, and telephone number of a person from whom interested persons may obtain further information

including copies of the draft permit or fact sheet, and the application; and

11.10.a.5. A brief description of the comment procedures required by subsections 11.11. and 11.12. of these rules and the time and place of any hearing that will be held, including a statement of procedures to request a hearing unless already scheduled, and other procedures by which the public may participate in the final permit decision.

11.10.b. In addition to the general public notice described in subdivision 11.10.a. of these rules, the public notice of a hearing shall contain the following information:

11.10.b.1. Reference to the date of previous public notices relating to the permit;

11.10.b.2. Date, time and place of the hearing;

11.10.b.3. A brief description of the nature and purpose of the hearing, including the applicable rules and procedures; and

11.10.b.4. Name and address of the nearest district office where the file will be available for inspection.

11.11. **Public Comment and Request for Public Hearings.** During the public comment period provided that any interested person may submit written comments on the draft permit and may request a public hearing if no hearing has already been scheduled. A request for a public hearing shall be in writing and shall state the nature of the issues proposed to be raised in the hearing. All comments shall be considered in making the final decision and shall be answered as provided in subsections 11.13. and 11.14. of these rules.

11.12. **Public Hearings.**

11.12.a. The chief shall hold a public hearing whenever he finds, on the basis of requests, a significant degree of public interest in a draft permit(s). The chief may also hold a public hearing at his discretion whenever, for instance, such hearing may clarify one or more issues involved in the permit decision.

11.12.b. The chief shall hold a public hearing upon receiving written notice of opposition to a draft permit and a request for public hearing within forty-five (45) days of the public notice. Whenever possible the chief shall schedule a hearing under subsection 11.12. of these rules at a location convenient to the nearest such proposed facility. Public notice of the hearing shall be given as specified in subsection 11.8. of these rules.

11.13. Reopening of the Public Comment Period.

11.13.a. If any data, information, or arguments submitted during the public comment period appear to raise substantial new questions concerning a permit, the chief may take one or more of the following actions:

11.13.a.1. Prepare a new draft permit, appropriately modified, under subsection 11.2. of these rules.

11.13.a.2. Prepare a revised fact sheet under subsection 11.6. of these rules and reopen the comment period.

11.13.a.3. Reopen or extend the comment period under subsection 11.11. of these rules to give interested persons an opportunity to comment on the information or arguments submitted.

11.13.b. Comments filed during the reopened comment period shall be limited to the substantial new questions that caused its reopening. The public notice under subsection 11.8. of these rules shall define the scope of the reopening.

11.14. Response to Comments.

11.14.a. At the time that any final permit is issued, the chief shall issue a response to comments. This response shall be in writing and shall:

11.14.a.1. Specify which provisions, if any, of the draft permit have been changed in the final permit and the reasons for change; and

11.14.a.2. Briefly describe and respond to all significant comments on the draft permit raised during the public comment period or hearing.

11.14.b. The response to comments shall be delivered to any person who commented or any person who requests the same.

11.15. 40 CFR § 270.12. The provisions of 40 CFR § 270.12 are excepted from incorporation by reference. Availability of information provided under these rules is controlled by the provisions of W. Va. Code, § 22-18-12 and subsection 11.7. of these rules.

11.16. 40 CFR § 270.24. The provisions of 40 CFR § 270.24 are excepted from incorporation by reference. Consult the rules of the air quality board regarding emissions from process vents.

11.17. 40 CFR §§ 270.60(b) and 270.64. The provision of 40 CFR §§ 270.60(b) and 270.64 are excepted from incorporation by reference. Consult the rules of the office of water resources and

the environmental quality board regarding the requirements for underground injection wells.

§ 47-35-12. DEED AND LEASE DISCLOSURE; NOTICE IN DEED TO PROPERTY.

12.1. Recording Requirement. -- The owner of the property on which a hazardous waste management facility is located must record, in accordance with state law, a notation on the deed or lease to the facility property -- or on some other instrument that is normally examined during title search -- that will in perpetuity notify any potential purchaser of the property that:

12.1.a. The land has been used to manage hazardous wastes; and

12.1.b. Its use is restricted under 40 CFR § 264.117(c).

12.2. Upon actual transfer of property which contains hazardous wastes that have been stored, treated, or disposed of, the previous owner shall notify the chief in writing of such transfer.

12.3. Other Requirements. Nothing contained in this section of these rules shall relieve any person from complying with the requirements on deed and lease disclosures set forth in W. Va. Code, § 22-18-21.

§ 47-35-13. UNIVERSAL WASTE RULE.

13.1. 40 CFR Part 273. -- The provisions of 40 CFR part 273 are hereby adopted and incorporated by reference with the modifications, exceptions and additions contained in this section.

13.2 In addition to pesticides, lead acid batteries, and thermostats covered by 40 CFR part 273, mercury containing lamps, commonly known as florescent light bulbs, are also covered under part 273 as follows:

13.3. 40 CFR § 273.1 -- The provisions of 40 CFR § 273.1(a)(3) are amended to read as follows:

(3) Thermostats and mercury containing lamps as described in 40 CFR § 273.4

13.4. 40 CFR § 273.4 -- Applicability - mercury thermostats and mercury containing lamps -- the provisions of 40 CFR § 273.4 are amended by adding thereto a new subdivision designated subdivision (d) to read as follows:

(d) Whenever the phrase "mercury thermostats" or "thermostats" is used in 40 CFR part 273, the phrase is to be read to include mercury containing lamps except where such language refers to

mercury containing ampules. Mercury containing lamps shall be managed as universal waste to the same extent as mercury thermostats if the mercury containing lamp is a hazardous waste because it exhibits one or more of the characteristics identified in 40 CFR part 261, subpart C. Mercury containing lamps must be handled to prevent breakage, leakage or spillage of the hazardous constituents. In the event that the hazardous constituents are released, the handler must manage the material in accordance with all applicable universal waste remediation procedures and determine whether or not it is subject to the requirements of 40 CFR Parts 260 through 272.

13.5. 40 CFR § 273.6 -- Definitions -- The provisions of 40 CFR § 273.6 are amended to read as follows:

13.5.a. "Mercury containing lamp" means an electric lamp in which mercury is purposely introduced by the manufacturer for the operation of the lamp. Mercury containing lamps commonly include florescent lamps.

13.5.b. "Universal Waste" means any of the following hazardous wastes that are managed under the universal waste requirements of 40 CFR part 273:

- (1) Batteries as described in 40 CFR § 273.2;
- (2) Pesticides as described in 40 CFR § 273.3; and
- (3) Thermostats and mercury containing lamps as described in 40 CFR § 273.4.

13.6. 40 CFR §§ 273.20, 273.40, 273.56 -- Exports are excepted from incorporation by reference and shall remain the provenance of the environmental protection agency and in addition to the requirements contained therein, any person subject to the provisions of part 273 shall file with the chief copies of all documentation, manifests, exception reports, annual reports or records, inter alia, submitted to EPA, the administrator or the regional administrator as required by part 273.

13.7. 40 CFR 273.70 -- The provisions of 40 CFR 273.70 Imports are excepted from incorporation by reference to the extent jurisdiction is limited to West Virginia. Persons managing universal waste that is imported to West Virginia are subject to the requirements of this rule.

13.8. 40 CFR §§ 273.80 and 273.81 -- The provisions of 40 CFR § 273.80 and 273.81 are excepted from incorporation by reference. Consult the provisions of subdivision 2.5.d of this rule to petition to include a waste as a universal waste.

§ 47-35-14. STANDARDS FOR THE MANAGEMENT OF USED OIL.

14.1. 40 CFR Part 279. -- The provisions of 40 CFR part 279 are hereby adopted and incorporated by reference with the exception contained in this section.

14.2. 40 CFR Part 279.82(b). -- The term EPA at 40 CFR part 279.82(b) shall have the meaning of United States environmental protection agency.

14.3. Effective Date of Section 14. -- Notwithstanding the effective date of this rule, the effective date of the provisions of this section shall be July 1, 1995.

§ 47-35-15. MISCELLANEOUS PROVISIONS.

15.1. The provisions set forth in Appendix 1 are incorporated as a part of these rules.

TABLE 1
PERMIT APPLICATION FEE SCHEDULE

STORAGE

EPA CODE ACTIVITY	FEE	FEE
S01 Container	<100 tons capacity \$2,500.00	≥100 tons capacity \$3,750.00
S02 Tank	<100 tons capacity \$2,500.00	≥100 tons capacity \$3,750.00
S04 Surface Impoundment	<1,000 tons capacity \$10,000.00	≥1,000 tons capacity \$12,500.00
S05 Drip Pad	\$2,500.00	
S03 Waste Pile	<100 tons capacity \$5,000.00	≥100 tons capacity \$7,500.00
S06 Waste Pile (Containment Bldg.)	<100 tons capacity \$5,000.00	≥100 tons capacity \$ 7,500.00

DISPOSAL

EPA CODE ACTIVITY	FEE	FEE
D80 Landfill	<1,000 tons/year \$15,000.00	≥1,000 tons/year \$25,000.00
D81 Land Application	<1,000 tons/year \$15,000.00	≥1,000 tons/year \$25,000.00
D83 Surface Impoundment	<1,000 tons/year \$15,000.00	≥1,000 tons/year \$25,000.00

TABLE 1
PERMIT APPLICATION FEE SCHEDULE
(CONTINUED)

TREATMENT

EPA CODE ACTIVITY	FEE	FEE
T01 Tank	<100 tons capacity \$2,500.00	≥100 tons capacity \$3,750.00
T02 Surface Impoundment	<1,000 tons/year \$10,000.00	≥1,000 tons/year \$12,500.00
T03 Incinerator	<1,000 tons/year \$5,000.00	≥1,000 tons/year \$7,500.00
T80 thru T93 Boiler/Industrial Furnace	<1,000 tons/year \$5,000.00	≥1,000 tons/year \$7,500.00
T04 Other	\$5,000.00	\$7,500.00
T-94 Containment Bldg. Treatment	\$5,000.00	\$7,500.00

EMERGENCY PERMITS

EPA CODE ACTIVITY	FEE
State and Federal	Nil
Others	\$500.00

TABLE I
PERMIT APPLICATION FEE SCHEDULE
(CONTINUED)

MISCELLANEOUS

EPA CODE ACTIVITY	FEE
Permit Modification under 40 CFR, 270.42 (Class I, II, III)	\$1,250.00
Modification under 40 CFR, 270.41	\$2,500.00
Post-Closure Care Permit	\$15,000.00
Closure Plans	\$1,500.00

must be followed to insure that no contamination exists or remains at the storage location.

1.9. Labeling. Containers and tanks accumulating or storing hazardous waste must comply with the following labeling requirements:

1.9.a. On each container, the date upon which each period of accumulation began must be clearly marked and visible for inspection.

1.9.b. Each container and tank must be clearly labeled or marked with the words "hazardous waste" while in use on site.

1.10. Manifest. Small quantity generators that transport or offer for transportation, hazardous waste for off site treatment, storage or disposal must prepare a manifest on the currently approved EPA form according to the instructions that accompany that form and in compliance with 40 CFR 262 subpart B unless the waste is reclaimed under a contractual agreement where:

1.10.a. The type of waste and frequency of shipments are specified in the agreement;

1.10.b. The vehicle used to transport the waste to the recycling facility and to deliver regenerated material back to the generator is owned and operated by the reclaimer of the waste; and

1.10.c. The generator maintains a copy of the reclamation agreement on site for a period of at least three (3) years after the termination or expiration of the agreement.

1.11. Record keeping. The small quantity generator must comply with the following record keeping requirements:

1.11.a. A copy of each properly completed manifest must be kept on site for at least three (3) years from the date that the waste was accepted by the initial transporter.

1.11.b. Any test results, waste analyses or other record of a method used to make a hazardous waste determination must be kept on site for at least three (3) years from the date that the waste was sent to on site or off site treatment, storage or disposal.

1.11.c. The three (3) year record retention time is automatically extended during the course of any unresolved enforcement action regarding regulated activity, or as requested by the chief.

1.11.d. If a copy of the manifest with the handwritten signature of the owner or operator of the designated facility has

not been received by the generator within 60 days of the date the waste was accepted by the initial transporter, the generator must submit a legible copy of the manifest with some indication that the generator has not received confirmation of delivery to the chief.

1.11.3. The chief, as he deems necessary, may require generators to furnish additional reports concerning the quantities and disposition of hazardous wastes.

1.12. Preparedness and prevention. Facilities must be maintained and operated to minimize the possibility of a fire, explosion or any unplanned sudden or non-sudden release of hazardous wastes or hazardous waste constituents to air, soil or surface water which could threaten human health or the environment and meet the following requirements in order to be eligible for the reduced requirements of this Appendix.

1.12.a. Required equipment. - All facilities must be equipped with the following unless none of the hazards posed by the wastes handled at the facility could require a particular kind of equipment specified below:

1.12.a.1. An internal communications or alarm system capable of providing immediate emergency instruction (voice or signal) to facility personnel.

1.12.a.2. A device such as a telephone (immediately available at the scene of operations) or a hand-held two-way radio, capable of summoning emergency assistance from local police departments, fire departments or state or local emergency response teams.

1.12.a.3. Portable fire extinguishers, fire control equipment (including special extinguishing equipment), spill control equipment and decontamination equipment.

1.12.a.4. Water at adequate volumes and pressure to supply water hose streams, or foam producing equipment or automatic sprinklers or water spray systems.

1.12.b. All facility communications or alarm systems, fire protection equipment, spill control equipment, and decontamination equipment where required must be tested and maintained as necessary to assure its proper operation in time of emergency.

1.12.c. Whenever hazardous waste is being handled all personnel involved in the operation must have immediate access to an internal alarm or an emergency communication device, either directly or through visual or voice contact with another unless such a device is not required by part a.12.A.2. of this Appendix. If there is just one employee on the premises while the facility is

operating, that employee must have immediate access to a device referenced by part a.12.A.2. of this Appendix.

1.12.d. The owner or operator must maintain aisle space to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment and decontamination equipment to any area of facility operation in an emergency unless aisle space is not needed for any of these purposes.

1.12.e. The owner or operator must attempt to make the following arrangements, as appropriate, for the type of waste handled at the facility and the potential need for the services of these organizations.

1.12.e.1. Arrangements to familiarize police, fire departments, and emergency response teams with the layout of the facility, properties of hazardous waste handled at the facility and associated hazards, places when facility personnel would normally be working, entrances to roads inside the facility and possible evacuation routes.

1.12.e.2. Arrangements designating primary emergency authority to a specific police and a specific fire department where more than one police or fire department might respond and arrangements with any others to provide support to the primary emergency authority.

1.12.e.3. Arrangements with state emergency response teams, emergency response contractors and equipment suppliers.

1.12.e.4. Arrangements to familiarize local hospitals with the properties of hazardous waste handled at the facility and the types of injuries or illnesses which could result from fires, explosions or releases at the facility.

1.12.f. Where state or local authorities decline to enter into such arrangements, the owner or operator must document the refusal in the operating record.

1.12.g. At all times there must be at least one employee either on the premises or on call (i.e., available to respond to an emergency by reaching the facility in a short period of time) with the responsibility for coordinating all emergency response measures specified in these regulations. This employee is the emergency coordinator.

1.12.h. The following information must be posted next to the telephone:

1.12.h.1. The name and telephone number of the emergency coordinator.

1.12.h.2. The location of fire extinguishers and spill control equipment and, if present, the fire alarm.

1.12.h.3. The telephone number of the fire department unless the facility has a direct alarm.

1.12.i. The generator must ensure that all employees are thoroughly familiar with proper waste handling and emergency procedures relevant to their responsibilities during normal facility operations and emergencies.

1.12.j. The emergency coordinator or his designee must respond to any emergencies that arise and initiate the proper response to the emergency including but not limited to calling the fire department in the event of a fire or remediating a spill.

1.12.k. In the event of a fire, explosion or other release that could threaten human health outside the facility or when the generator has knowledge that a spill has reached surface water, the generator must notify the National Response Center at 1-800-424-8802. The report must contain the following information:

1.12.k.1. The name, address and EPA identification number of the generator.

1.12.k.2 The date, time and type of incident.

1.12.k.3. Type and quantity of hazardous waste involved in the incident.

1.12.k.4. Extent of injuries, if any.

1.12.k.5. Estimated quantity and disposition of recovered materials, if any.

1.13. If a small quantity generator either exports or imports hazardous waste out of or into the United States of America, he must comply with Subparts E and F or 40 CFR Part 262 respectively.

1.14 A farmer disposing of waste pesticides from his own use which are hazardous wastes is not required to comply with the standards of this rule provided he triple rinses each emptied pesticide container that has held an acute hazardous waste with a solvent capable of removing the waste and disposes the pesticide residue on his own farm in a manner consistent with the disposal instructions on the pesticide label.

1.15. If a small quantity generator does not meet all the requirements set forth herein, the reduced requirements do not apply and the generator will be subject to full regulation.

2. Special requirements for hazardous waste generated by conditionally exempt small quantity generators.

2.1. A conditionally exempt small quantity generator is a generator of hazardous waste that produces no more than 100 kilograms of hazardous waste per calendar month or no more than one (1) kilogram of acute hazardous waste and that meets the requirements stipulated below.

2.1.a. If the generator generates a total of one (1) kilogram or more of acute hazardous waste identified in 40 CFR part 261 in a calendar month, the waste shall be subject to full regulation.

2.2. The conditionally exempt small quantity generator must make a proper hazardous waste determination as specified in paragraph a.2. of this Appendix. When determining the amount of hazardous waste generated, a generator need only include those wastes that are generated on site prior to reclamation, and are not excluded under 40 CFR part 261.

2.3. The conditionally exempt small quantity generator must notify the chief of its hazardous waste generation activity. No generator shall treat, store or dispose of, transport or offer for transportation hazardous waste without having received an EPA identification number.

2.4. A conditionally exempt small quantity generator may accumulate up to 1000 kilograms of hazardous waste on site before becoming subject to the requirements of paragraph a.5. of this Appendix with the exception that:

2.4.a. A total of 100 kilograms of any residue or contaminated soil, waste or other debris resulting from the clean-up of a spill into or on any land or water of any acute hazardous wastes listed in 40 CFR part 261 may be accumulated before becoming subject to full regulation.

2.5. Record keeping. The generator must establish and maintain on site a written record specifying the quantity and types hazardous wastes disposed of, the dates the wastes were transported off site and the final disposition of the wastes. The preferred method for this requirement is via the manifest.

2.6. The generator must either treat or dispose of hazardous waste in an on site facility or ensure delivery to an off site treatment, storage or disposal facility either of which:

2.6.a. Is permitted, or under interim status, to treat, store or dispose of hazardous waste by a state or the federal government or both;

2.6.b. Is permitted, licensed or registered by a state other than West Virginia to manage waste generated by conditionally exempt small quantity facilities;

2.6.c. Beneficially uses or re-uses or legitimately recycles or reclaims the waste; or,

2.6.d. Treats the waste prior to beneficial use or re-use of legitimate recycling or reclamation.

2.7. Hazardous waste subject to the reduced requirements of subdivision b may be mixed with non-hazardous waste and remain subject to the reduced requirements even though the resultant mixture exceeds the quantity limitations in paragraph b.4. of this Appendix unless the mixture meets any of the characteristics of hazardous waste identified in 40 CFR part 261 with the following modifications:

2.7.a. If any person mixes a waste with a hazardous waste that exceeds a quantity exclusion level of paragraph b.4. of this Appendix, the mixture is subject to full regulations.

2.7.b. If a conditionally exempt small quantity generator's wastes are mixed with used oil, the mixture is subject to 40 CFR part 279.

2.8. If a conditionally exempt small quantity generator does not meet all of the requirements set forth herein, the exemption does not apply and the generator will be subject to full regulation.

(2) Tests for nonbiodegradable sorbents. (i) The sorbent material is determined to be nonbiodegradable under ASTM Method G21-70 (1984a)—Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi; or

(ii) The sorbent material is determined to be nonbiodegradable under ASTM Method G22-76 (1984b)—Standard Practice for Determining Resistance of Plastics to Bacteria.

(f) Effective November 8, 1985, the placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of such landfill demonstrates to the Regional Administrator, or the Regional Administrator determines, that:

(1) The only reasonably available alternative to the placement in such landfill is placement in a landfill or unlined surface impoundment, whether or not permitted or operating under interim status, which contains, or may reasonably be anticipated to contain, hazardous waste; and

(2) Placement in such owner or operator's landfill will not present a risk of contamination of any underground source of drinking water (as that term is defined in § 144.3 of this chapter.)

[47 FR 32365, July 26, 1992, as amended at 50 FR 18374, Apr. 30, 1985; 50 FR 28748, July 15, 1985; 57 FR 54460, Nov. 18, 1992; 58 FR 46050, Aug. 31, 1993]

§ 264.315 Special requirements for containers.

Unless they are very small, such as an ampule, containers must be either:

(a) At least 90 percent full when placed in the landfill; or

(b) Crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.

§ 264.316 Disposal of small containers of hazardous waste in overpacked drums (lab packs).

Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if the following requirements are met:

(a) Hazardous waste must be packaged in non-leaking inside containers. The inside containers must be of a design and constructed of a mate-

rial that will not react dangerously with, be decomposed by, or be ignited by the contained waste. Inside containers must be tightly and securely sealed. The inside containers must be of the size and type specified in the Department of Transportation (DOT) hazardous materials regulations (49 CFR parts 173, 178, and 179), if those regulations specify a particular inside container for the waste.

(b) The inside containers must be overpacked in an open head DOT-specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with § 264.314(e), to completely sorb all of the liquid contents of the inside containers. The metal outer container must be full after it has been packed with inside containers and sorbent material.

(c) The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers, in accordance with § 264.17(b).

(d) Incompatible wastes, as defined in § 260.10 of this chapter, must not be placed in the same outside container.

(e) Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in § 261.23(a)(5) of this chapter, must be treated or rendered non-reactive prior to packaging in accordance with paragraphs (a) through (d) of this section. Cyanide- and sulfide-bearing reactive waste may be packed in accordance with paragraphs (a) through (d) of this section without first being treated or rendered non-reactive.

(f) Such disposal is in compliance with the requirements of part 268. Persons who incinerate lab packs according to the requirements in 40 CFR 268.42(c)(1) may use fiber drums in place of metal outer containers. Such fiber drums must meet the DOT specifications in 49 CFR 173.12 and be overpacked according to the requirements in paragraph (b) of this section.

[47 FR 32365, July 26, 1992, as amended at 55 FR 22685, June 1, 1990; 57 FR 54460, Nov. 18, 1992]

Environmental Protection Agency

§ 264.317 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO26, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO26, and FO27 must not be placed in a landfill unless the owner or operator operates the landfill in accord with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring requirements.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for landfills managing hazardous wastes FO20, FO21, FO22, FO23, FO26, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

[50 FR 2004, Jan. 14, 1985]

Subpart O—Incinerators

§ 264.340 Applicability.

(a) The regulations of this subpart apply to owners and operators of hazardous waste incinerators (as defined in § 260.10 of this chapter), except as § 264.1 provides otherwise.

(b) After consideration of the waste analysis included with part B of the permit application, the Regional Administrator, in establishing the permit conditions, must exempt the applicant from all requirements of this subpart except § 264.341 (Waste analysis) and § 264.351 (Closure).

(1) If the Regional Administrator finds that the waste to be burned is:

(i) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is ignitable (Hazard Code 1), corrosive (Hazard Code C), or both; or

(ii) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is reactive (Hazard Code R) for characteristics other than those listed in § 261.23(a) (4) and (5), and will not be burned when other hazardous wastes are present in the combustion zone; or

(iii) A hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the test for characteristics of hazardous wastes under part 261, subpart C, of this chapter; or

(iv) A hazardous waste solely because it possesses any of the reactivity characteristics described by § 261.23(a) (1), (2), (3), (6), (7), and (8) of this chapter, and will not be burned when other hazardous wastes are present in the combustion zone; and

(2) If the waste analysis shows that the waste contains none of the hazardous constituents listed in part 261, appendix VIII, of this chapter, which would reasonably be expected to be in the waste.

(c) If the waste to be burned is one which is described by paragraphs (b)(1)(i), (ii), (iii), or (iv) of this section and contains insignificant concentrations of the hazardous constituents listed in part 261, appendix VIII, of this chapter, then the Regional Administrator may, in establishing permit conditions, exempt the applicant from all requirements of this subpart, except § 264.341 (Waste analysis) and § 264.351 (Closure), after consideration of the waste analysis included with part B of the permit application, unless the Regional Administrator finds that the waste will pose a threat to human health and the environment when burned in an incinerator.

(d) The owner or operator of an incinerator may conduct trial burns subject only to the requirements of § 270.52 of this chapter (Short term and incinerator permits).

[46 FR 7678, Jan. 23, 1981, as amended at 47 FR 27532, June 24, 1982; 48 FR 14296, Apr. 1, 1983; 50 FR 685, Jan. 4, 1985; 50 FR 49200, Nov. 29, 1985; 56 FR 7207, Feb. 21, 1991]

(2) Tests for nonbiodegradable sorbents. (1) The sorbent material is determined to be nonbiodegradable under ASTM Method G21-70 (1984a)—Standard Practice for Determining Resistance of Synthetic Polymer Materials to Fungi; or

(ii) The sorbent material is determined to be nonbiodegradable under ASTM Method G22-76 (1984b)—Standard Practice for Determining Resistance of Plastics to Bacteria.

(f) Effective November 8, 1985, the placement of any liquid which is not a hazardous waste in a landfill is prohibited unless the owner or operator of such landfill demonstrates to the Regional Administrator, or the Regional Administrator determines, that:

(1) The only reasonably available alternative to the placement in such landfill is placement in a landfill or unlined surface impoundment, whether or not permitted or operating under interim status, which contains, or may reasonably be anticipated to contain, hazardous waste; and

(2) Placement in such owner or operator's landfill will not present a risk of contamination of any underground source of drinking water (as that term is defined in § 144.3 of this chapter.)

(47 FR 32365, July 26, 1982, as amended at 50 FR 18374, Apr. 30, 1985; 50 FR 28716, July 15, 1985; 57 FR 54460, Nov. 18, 1992; 58 FR 40650, Aug. 31, 1993)

§ 264.315 Special requirements for containers.

Unless they are very small, such as an ampule, containers must be either:

(a) At least 90 percent full when placed in the landfill; or

(b) Crushed, shredded, or similarly reduced in volume to the maximum practical extent before burial in the landfill.

§ 264.316 Disposal of small containers of hazardous waste in overpacked drums (lab packs).

Small containers of hazardous waste in overpacked drums (lab packs) may be placed in a landfill if the following requirements are met:

(a) Hazardous waste must be packaged in non-leaking inside containers. The inside containers must be of a design and constructed of a mate-

rial that will not react dangerously with, be decomposed by, or be ignited by the contained waste. Inside containers must be tightly and securely sealed. The inside containers must be of the size and type specified in the Department of Transportation (DOT) hazardous materials regulations (49 CFR parts 173, 178, and 179), if those regulations specify a particular inside container for the waste.

(b) The inside containers must be overpacked in an open head DOT specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with § 264.314(e), to completely sorb all of the liquid contents of the inside containers. The metal outer container must be full after it has been packed with inside containers and sorbent material.

(c) The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside containers, in accordance with § 264.17(b).

(d) Incompatible wastes, as defined in § 260.10 of this chapter, must not be placed in the same outside container.

(e) Reactive wastes, other than cyanide- or sulfide-bearing waste as defined in § 261.23(a)(5) of this chapter, must be treated or rendered non-reactive prior to packaging in accordance with paragraphs (a) through (d) of this section. Cyanide- and sulfide-bearing reactive waste may be packed in accordance with paragraphs (a) through (d) of this section without first being treated or rendered non-reactive.

(f) Such disposal is in compliance with the requirements of part 268. Persons who incinerate lab packs according to the requirements in 40 CFR 268.42(c)(1) may use fiber drums in place of metal outer containers. Such fiber drums must meet the DOT specifications in 49 CFR 173.12 and be overpacked according to the requirements in paragraph (b) of this section.

(47 FR 32365, July 26, 1982, as amended at 55 FR 23656, June 1, 1990; 57 FR 54460, Nov. 18, 1992)

Environmental Protection Agency

§ 264.317 Special requirements for hazardous wastes FO20, FO21, FO22, FO23, FO26, and FO27.

(a) Hazardous Wastes FO20, FO21, FO22, FO23, FO26, and FO27 must not be placed in a landfill unless the owner or operator operates the landfill in accord with a management plan for these wastes that is approved by the Regional Administrator pursuant to the standards set out in this paragraph, and in accord with all other applicable requirements of this part. The factors to be considered are:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through the soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring requirements.

(b) The Regional Administrator may determine that additional design, operating, and monitoring requirements are necessary for landfills managing hazardous wastes FO20, FO21, FO22, FO23, FO26, and FO27 in order to reduce the possibility of migration of these wastes to ground water, surface water, or air so as to protect human health and the environment.

(50 FR 2004, Jan. 14, 1985)

Subpart O—Incinerators

§ 264.340 Applicability.

(a) The regulations of this subpart apply to owners and operators of hazardous waste incinerators (as defined in § 260.10 of this chapter), except as § 264.1 provides otherwise.

(b) After consideration of the waste analysis included with part B of the permit application, the Regional Administrator, in establishing the permit conditions, must exempt the applicant from all requirements of this subpart except § 264.341 (Waste analysis) and § 264.351 (Closure).

(1) If the Regional Administrator finds that the waste to be burned is:

(i) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is ignitable (Hazard Code 1), corrosive (Hazard Code C), or both; or

(ii) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is reactive (Hazard Code R) for characteristics other than those listed in § 261.23(a) (4) and (5), and will not be burned when other hazardous wastes are present in the combustion zone; or

(iii) A hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the test for characteristics of hazardous wastes under part 261, subpart C, of this chapter; or

(iv) A hazardous waste solely because it possesses any of the reactivity characteristics described by § 261.23(a) (1), (2), (3), (6), (7), and (8) of this chapter, and will not be burned when other hazardous wastes are present in the combustion zone; and

(2) If the waste analysis shows that the waste contains none of the hazardous constituents listed in part 261, appendix VIII, of this chapter, which would reasonably be expected to be in the waste.

(c) If the waste to be burned is one which is described by paragraphs (b)(1)(i), (ii), (iii), or (iv) of this section and contains insignificant concentrations of the hazardous constituents listed in part 261, appendix VIII, of this chapter, then the Regional Administrator may, in establishing permit conditions, exempt the applicant from all requirements of this subpart, except §§ 264.341 (Waste analysis) and § 264.351 (Closure), after consideration of the waste analysis included with part B of the permit application, unless the Regional Administrator finds that the waste will pose a threat to human health and the environment when burned in an incinerator.

(d) The owner or operator of an incinerator may conduct trial burns subject only to the requirements of § 270.62 of this chapter (Short term and incinerator permits).

(48 FR 7678, Jan. 23, 1983, as amended at 47 FR 27532, June 24, 1982; 48 FR 14286, Apr. 1, 1983; 50 FR 665, Jan. 4, 1985; 50 FR 49203, Nov. 20, 1985; 56 FR 7207, Feb. 21, 1991)

§ 264.341 Waste analysis.

(a) As a portion of the trial burn plan required by § 270.62 of this chapter, or with part B of the permit application, the owner or operator must have included an analysis of the waste feed sufficient to provide all information required by § 270.62(b) or § 270.19 of this chapter. Owners or operators of new hazardous waste incinerators must provide the information required by § 270.62(c) or § 270.19 of this chapter to the greatest extent possible.

(b) Throughout normal operation the owner or operator must conduct sufficient waste analysis to verify that waste feed to the incinerator is within the physical and chemical composition limits specified in his permit (under § 264.345(b)).

[46 FR 7678, Jan. 23, 1981, as amended at 47 FR 27532, June 24, 1982; 48 FR 14295, Apr. 1, 1983; 49 FR 30115, June 30, 1983; 50 FR 4514, Jan. 31, 1985]

§ 264.342 Principal organic hazardous constituents (POHCs).

(a) Principal Organic Hazardous Constituents (POHCs) in the waste feed must be treated to the extent required by the performance standard of § 264.343.

(b)(1) One or more POHCs will be specified in the facility's permit, from among the constituents listed in part 261, appendix VIII of this chapter, for each waste feed to be burned. This specification will be based on the degree of difficulty of incineration of the organic constituents in the waste and on their concentration or mass in the waste feed, considering the results of waste analyses and trial burns or alternative data submitted with part B of the facility's permit application. Organic constituents which represent the greatest degree of difficulty of incineration will be those most likely to be designated as POHCs. Constituents are more likely to be designated as POHCs if they are present in large quantities or concentrations in the waste.

(2) Trial POHCs will be designated for performance of trial burns in accordance with the procedure specified in § 270.62 of this chapter for obtaining trial burn permits.

[46 FR 7678, Jan. 23, 1981, as amended at 48 FR 14295, Apr. 1, 1983]

§ 264.343 Performance standards.

An incinerator burning hazardous waste must be designed, constructed, and maintained so that, when operated in accordance with operating requirements specified under § 264.345, it will meet the following performance standards:

(a)(1) Except as provided in paragraph (a)(2) of this section, an incinerator burning hazardous waste must achieve a destruction and removal efficiency (DRE) of 99.99% for each principal organic hazardous constituent (POHC) designated (under § 264.342) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$DRE = \frac{(W_m - W_{out})}{W_m} \times 100\%$$

where:

W_m = mass feed rate of one principal organic hazardous constituent (POHC) in the waste stream feeding the incinerator

and

W_{out} = mass emission rate of the same POHC present in exhaust emissions prior to release to the atmosphere.

(2) An incinerator burning hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27 must achieve a destruction and removal efficiency (DRE) of 99.999% for each principal organic hazardous constituent (POHC) designated (under § 264.342) in its permit. This performance must be demonstrated on POHCs that are more difficult to incinerate than tetra-, penta-, and hexachlorodibenzo-p-dioxins and dibenzofurans. DRE is determined for each POHC from the equation in § 264.343(a)(1). In addition, the owner or operator of the incinerator must notify the Regional Administrator of his intent to incinerate hazardous wastes FO20, FO21, FO22, FO23, FO26, or FO27.

(b) An incinerator burning hazardous waste and producing stack emissions of more than 1.8 kilograms per hour (4 pounds per hour) of hydrogen chloride (HCl) must control HCl emissions such that the rate of emission is no greater than the larger of either 1.8 kilograms per hour or 1% of the HCl in the stack gas prior to entering any pollution control equipment.

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(c) An incinerator burning hazardous waste must not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) when corrected for the amount of oxygen in the stack gas according to the formula:

$$P_c = P_m \times \frac{14}{21 - Y}$$

Where P_c is the corrected concentration of particulate matter, P_m is the measured concentration of particulate matter, and Y is the measured concentration of oxygen in the stack gas, using the Orsat method for oxygen analysis of dry flue gas, presented in part 60, appendix A (Method 3), of this chapter. This correction procedure is to be used by all hazardous waste incinerators except those operating under conditions of oxygen enrichment. For these facilities, the Regional Administrator will select an appropriate correction procedure, to be specified in the facility permit.

(d) For purposes of permit enforcement, compliance with the operating requirements specified in the permit (under § 264.345) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the performance requirements of this section may be "information" justifying modification, revocation, or reissuance of a permit under § 270.41 of this chapter.

[46 FR 7678, Jan. 23, 1981, as amended at 47 FR 27532, June 24, 1982; 48 FR 14295, Apr. 1, 1983; 50 FR 2005, Jan. 14, 1985]

§ 264.344 Hazardous waste incinerator permits.

(a) The owner or operator of a hazardous waste incinerator may burn only wastes specified in his permit and only under operating conditions specified for those wastes under § 264.345, except:

(1) In approved trial burns under § 270.62 of this chapter; or

(2) Under exemptions created by § 264.340.

(b) Other hazardous wastes may be burned only after operating conditions have been specified in a new permit or

a permit modification as applicable. Operating requirements for new wastes may be based on either trial burn results or alternative data included with part B of a permit application under § 270.19 of this chapter.

(c) The permit for a new hazardous waste incinerator must establish appropriate conditions for each of the applicable requirements of this subpart, including but not limited to allowable waste feeds and operating conditions necessary to meet the requirements of § 264.345, sufficient to comply with the following standards:

(1) For the period beginning with initial introduction of hazardous waste to the incinerator and ending with initiation of the trial burn, and only for the minimum time required to establish operating conditions required in paragraph (c)(2) of this section, not to exceed a duration of 720 hours operating time for treatment of hazardous waste, the operating requirements must be those most likely to ensure compliance with the performance standards of § 264.343, based on the Regional Administrator's engineering judgment. The Regional Administrator may extend the duration of this period once for up to 720 additional hours when good cause for the extension is demonstrated by the applicant.

(2) For the duration of the trial burn, the operating requirements must be sufficient to demonstrate compliance with the performance standards of § 264.343 and must be in accordance with the approved trial burn plan;

(3) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, and submission of the trial burn results by the applicant, and review of the trial burn results and modification of the facility permit by the Regional Administrator, the operating requirements must be those most likely to ensure compliance with the performance standards of § 264.343, based on the Regional Administrator's engineering judgment.

(4) For the remaining duration of the permit, the operating requirements must be those demonstrated, in a trial burn or by alternative data specified in § 270.19(c) of this chapter, as sufficient

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to ensure compliance with the performance standards of § 264.343.

(46 FR 7678, Jan. 23, 1981, as amended at 47 FR 27532, June 24, 1982; 48 FR 14295, Apr. 1, 1983; 50 FR 4514, Jan. 31, 1985)

§ 264.345 Operating requirements.

(a) An incinerator must be operated in accordance with operating requirements specified in the permit. These will be specified on a case-by-case basis as those demonstrated (in a trial burn or in alternative data as specified in § 264.344(b) and included with part B of a facility's permit application) to be sufficient to comply with the performance standards of § 264.343.

(b) Each set of operating requirements will specify the composition of the waste feed (including acceptable variations in the physical or chemical properties of the waste feed which will not affect compliance with the performance requirements of § 264.343) to which the operating requirements apply. For each such waste feed, the permit will specify acceptable operating limits including the following conditions:

- (1) Carbon monoxide (CO) level in the stack exhaust gas;
 - (2) Waste feed rate;
 - (3) Combustion temperature;
 - (4) An appropriate indicator of combustion gas velocity;
 - (5) Allowable variations in incinerator system design or operating procedures; and
 - (6) Such other operating requirements as are necessary to ensure that the performance standards of § 264.343 are met.
- (c) During start-up and shut-down of an incinerator, hazardous waste (except wastes exempted in accordance with § 264.340) must not be fed into the incinerator unless the incinerator is operating within the conditions of operation (temperature, air feed rate, etc.) specified in the permit.
- (d) Fugitive emissions from the combustion zone must be controlled by:
- (1) Keeping the combustion zone totally sealed against fugitive emissions; or
 - (2) Maintaining a combustion zone pressure lower than atmospheric pressure; or

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adequate. At a minimum, operational testing must be conducted at least monthly.

(d) This monitoring and inspection data must be recorded and the records must be placed in the operating log required by § 264.73.

(46 FR 7678, Jan. 23, 1981, as amended at 47 FR 27532, June 24, 1982; 50 FR 4514, Jan. 31, 1985)

§ 264.348—264.350 [Reserved]

§ 264.351 Closure.

At closure the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the incinerator site.

(Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with § 261.3(d) of this chapter, that the residue removed from the incinerator is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with applicable requirements of parts 262 through 266 of this chapter.)

(46 FR 7678, Jan. 23, 1981)

Subpart P-R (Reserved)

Subpart S—Corrective Action for Solid Waste Management Units

§ 264.552 Corrective Action Management Units (CAMU).

(a) For the purpose of implementing remedies under § 264.101 or RCRA Section 3008(h), the Regional Administrator may designate an area at the facility as a corrective action management unit, as defined in § 260.10, in accordance with the requirements of this section. One or more CAMUs may be designated at a facility.

(1) Placement of remediation wastes into or within a CAMU does not constitute land disposal of hazardous wastes.

(2) Consolidation or placement of remediation wastes into or within a CAMU does not constitute creation of a unit subject to minimum technology requirements.

(b)(1) The Regional Administrator may designate a regulated unit (as de-

fined in § 264.90(a)(2)) as a CAMU, or may incorporate a regulated unit into a CAMU, if:

(i) The regulated unit is closed or closing, meaning it has begun the closure process under § 264.113 or § 265.113; and

(ii) Inclusion of the regulated unit will enhance implementation of effective, protective and reliable remedial actions for the facility.

(2) The subpart F, G, and H requirements and the unit-specific requirements of part 264 or 265 that applied to that regulated unit will continue to apply to that portion of the CAMU after incorporation into the CAMU.

(c) The Regional Administrator shall designate a CAMU in accordance with the following:

(1) The CAMU shall facilitate the implementation of reliable, effective, protective, and cost-effective remedies;

(2) Waste management activities associated with the CAMU shall not create unacceptable risks to humans or to the environment resulting from exposure to hazardous wastes or hazardous constituents;

(3) The CAMU shall include uncontaminated areas of the facility, only if including such areas for the purpose of managing remediation waste is more protective than management of such wastes at contaminated areas of the facility;

(4) Areas within the CAMU, where wastes remain in place after closure of the CAMU, shall be managed and contained so as to minimize future releases, to the extent practicable;

(5) The CAMU shall expedite the timing of remedial activity implementation, when appropriate and practicable;

(6) The CAMU shall enable the use, when appropriate, of treatment technologies (including innovative technologies) to enhance the long-term effectiveness of remedial actions by reducing the toxicity, mobility, or volume of wastes that will remain in place after closure of the CAMU; and

(7) The CAMU shall, to the extent practicable, minimize the land area of the facility upon which wastes will remain in place after closure of the CAMU.

(d) The owner/operator shall provide sufficient information to enable the

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soils can be practicably removed at closure; and

(ii) Prepare a contingent post-closure plan under § 264.118 of this part for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§ 264.112 and 264.144 of this part for closure and post-closure care of a drip pad subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a) of this section.

Subpart X—Miscellaneous Units

Source: 52 FR 46864, Dec. 10, 1987, unless otherwise noted.

§ 264.600 Applicability.

The requirements in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units, except as § 264.1 provide otherwise.

§ 264.601 Environmental performance standards.

A miscellaneous unit must be located, designed, constructed, operated, maintained, and closed in a manner that will ensure protection of human health and the environment. Permits for miscellaneous units are to contain such terms and provisions as necessary to protect human health and the environment, including, but not limited to, as appropriate, design and operating requirements, detection and monitoring requirements, and requirements for responses to releases of hazardous waste or hazardous constituents from the unit. Permit terms and provisions shall include those requirements of subparts I through O and subparts AA through CC of this part, part 270, and part 146 that are appropriate for the miscellaneous unit being permitted. Protection of human health and the environment includes, but is not limited to:

- (a) Prevention of any releases that may have adverse effects on human health or the environment due to migration of waste constituents from the unit;
- (b) The volume and physical and chemical characteristics of the waste in the unit;
- (c) The effectiveness and reliability of containing, confining, and collecting systems and structures in preventing migration;
- (d) The hydrologic characteristics of the unit and the surrounding area, including the topography of the land around the unit;
- (e) The patterns of precipitation in the region;
- (f) The quantity, quality, and direction of ground-water flow;
- (g) The proximity of the unit to surface waters;
- (h) The current and potential uses of nearby surface waters and any water

quality standards established for those surface waters;

(8) The existing quality of surface waters and surface soils, including other sources of contamination and their cumulative impact on surface waters and surface soils;

(9) The patterns of land use in the region;

(10) The potential for health risks caused by human exposure to waste constituents; and

(11) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

(c) Prevention of any release that may have adverse effects on human health or the environment due to migration of waste constituents in the air, considering:

(1) The volume and physical and chemical characteristics of the waste in the unit, including its potential for the emission and dispersal of gases, aerosols and particulates;

(2) The effectiveness and reliability of systems and structures to reduce or prevent emissions of hazardous constituents to the air;

(3) The operating characteristics of the unit;

(4) The atmospheric, meteorologic, and topographic characteristics of the unit and the surrounding area;

(5) The existing quality of the air, including other sources of contamination and their cumulative impact on the air;

(6) The potential for health risks caused by human exposure to waste constituents; and

(7) The potential for damage to domestic animals, wildlife, crops, vegetation, and physical structures caused by exposure to waste constituents.

[59 FR 62927, Dec. 6, 1994]

EFFECTIVE DATE NOTE: At 59 FR 62927, Dec. 6, 1994, in § 264.601, the introductory text was amended by adding "and subparts AA through CC" after the words "and subparts I through O". At 60 FR 26828, May 19, 1995, the effective date was delayed to December 6, 1995.

§ 264.602 Monitoring, analysis, inspection, response, reporting, and corrective action.

Monitoring, testing, analytical data, inspections, response, and reporting procedures and frequencies must ensure compliance with §§ 264.601, 264.15, 264.33, 264.75, 264.76, 264.77, and 264.101 as well as meet any additional requirements needed to protect human health and the environment as specified in the permit.

§ 264.603 Post-closure care.

A miscellaneous unit that is a disposal unit must be maintained in a manner that complies with § 264.601 during the post-closure care period. In addition, if a treatment or storage unit has contaminated soils or ground water that cannot be completely removed or decontaminated during closure, then that unit must also meet the requirements of § 264.601 during post-closure care. The post-closure plan under § 264.118 must specify the procedures that will be used to satisfy this requirement.

Subparts Y–Z (Reserved)

Subpart AA—Air Emission Standards for Process Vents

Source: 55 FR 25494, June 21, 1990, unless otherwise noted.

§ 264.1030 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 264.1).

(b) Except for §§ 264.1034 (d) and (e), this subpart applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes with organic concentrations of at least 10-ppmw. If these operations are conducted in:

- (1) Units that are subject to the permitting requirements of part 270, or
- (2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise sub-

ject to the permitting requirements of part 270.

(c) If the owner or operator of process vents subject to the requirements of §§ 264.1032 through 264.1036 has received a permit under section 3005 of RCRA prior to December 21, 1990 the requirements of §§ 264.1032 through 264.1036 must be incorporated when the permit is reissued under § 264.15 or reviewed under § 270.50.

(NOTE: The requirements of §§ 264.1032 through 264.1036 apply to process vents on hazardous waste recycling units previously exempt under § 261.6(c)(1). Other exemptions under §§ 261.4, 261.34, and 264.1(g) are not affected by these requirements.)

(55 FR 24494, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991)

§ 264.1031 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and parts 260-266.

Air stripping operation is a desorption operation employed to transfer one or more volatile components from a liquid mixture into a gas (air) either with or without the application of heat to the liquid. Packed towers, spray towers, and bubble-cap, sieve, or valve-type plate towers are among the process configurations used for contacting the air and a liquid.

Bottoms receiver means a container or tank used to receive and collect the heavier bottoms fractions of the distillation feed stream that remain in the liquid phase.

Closed-vent system means a system that is not open to the atmosphere and that is composed of piping, connections, and, if necessary, flow-inducing devices that transport gas or vapor from a piece or pieces of equipment to a control device.

Condenser means a heat-transfer device that reduces a thermodynamic fluid from its vapor phase to its liquid phase.

Connector means flanged, screwed, welded, or other joined fittings used to connect two pipelines or a pipeline and a piece of equipment. For the purposes of reporting and recordkeeping, connector means flanged fittings that are not covered by insulation or other ma-

components of different boiling points in successive stages, each stage removing from the mixture some proportion of one of the components.

Hazardous waste management unit means a work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit. An unscheduled work practice or operational procedure that stops operation of a hazardous waste management unit or part of a hazardous waste management unit for less than 24 hours is not a hazardous waste management unit shutdown. The use of spare equipment and technically feasible bypassing of equipment without stopping operation are not hazardous waste management unit shutdowns.

Hot well means a container for collecting condensate as in a steam condenser serving a vacuum-jet or steam-jet ejector.

In gas/vapor service means that the piece of equipment contains or contacts a hazardous waste stream that is in the gaseous state at operating conditions.

In heavy liquid service means that the piece of equipment is not in gas/vapor service or in light liquid service.

In light liquid service means that the piece of equipment contains or contacts a waste stream where the vapor pressure of one or more of the components in the stream is greater than 0.3 kilopascals (kPa) at 20 °C, the total concentration of the pure components having a vapor pressure greater than 0.3 kPa at 20 °C is equal to or greater than 20 percent by weight, and the fluid is a liquid at operating conditions.

In situ sampling systems means nonextractive samplers or in-line samplers.

In vacuum service means that equipment is operating at an internal pressure that is at least 5 kPa below ambient pressure.

Malfunction means any sudden failure of a control device or a hazardous waste management unit or failure of a hazardous waste management unit to operate in a normal or usual manner, so that organic emissions are increased.

Open-ended valve or line means any valve, except pressure relief valves, having one side of the valve seat in contact with process fluid and one side open to the atmosphere, either directly or through open piping.

Pressure release means the emission of materials resulting from the system pressure being greater than the set pressure of the pressure relief device.

Process heater means a device that transfers heat liberated by burning fuel to fluids contained in tubes, including all fluids except water that are heated to produce steam.

Process vent means any open-ended pipe or stack that is vented to the atmosphere either directly, through a vacuum-producing system, or through a tank (e.g., distillate receiver, condenser, bottoms receiver, surge control tank, separator tank, or hot well) associated with hazardous waste distillation, fractionation, thin-film evaporation, solvent extractions, or air or steam stripping operations.

Repaired means that equipment is adjusted, or otherwise altered, to eliminate a leak.

Sensor means a device that measures a physical quantity or the change in a physical quantity, such as temperature, pressure, flow rate, pH, or liquid level.

Separator tank means a device used for separation of two immiscible liquids.

Solvent extraction operation means an operation or method of separation in which a solid or solution is contacted with a liquid solvent (the two being mutually insoluble) to preferentially dissolve and transfer one or more components into the solvent.

Startup means the setting in operation of a hazardous waste management unit or control device for any purpose.

Steam stripping operation means a distillation operation in which vaporization of the volatile constituents of the liquid mixture takes place by the introduction of steam directly into the charge.

Surge control tank means a large-sized pipe or storage reservoir sufficient to contain the surging liquid discharge of the process tank to which it is connected.

Thin-film evaporation operation means a distillation operation that employs a heating surface consisting of a large diameter tube that may be either straight or tapered, horizontal or vertical. Liquid is spread on the tube wall by a rotating assembly of blades that maintain a close clearance from the wall or actually ride on the film of liquid on the wall.

Vapor incinerator means any enclosed combustion device that is used for destroying organic compounds and does not extract energy in the form of steam or process heat.

Vented means discharged through an opening, typically an open-ended pipe or stack, allowing the passage of a stream of liquids, gases, or fumes into the atmosphere. The passage of liquids, gases, or fumes is caused by mechanical means such as compressors or vacuum-producing systems or by process-related means such as evaporation produced by heating and not caused by tank loading and unloading (working losses) or by natural means such as diurnal temperature changes.

§ 264.1032 Standards: Process vents.

(a) The owner or operator of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extractions, or air or steam stripping operations managing hazardous wastes with organic concentrations of at least 10 ppmw shall either:

(1) Reduce total organic emissions from all affected process vents at the facility below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr), or

(2) Reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent.

(b) If the owner or operator installs a closed-vent system and control device to comply with the provisions of paragraph (a) of this section the closed-vent system and control device must meet the requirements of § 264.1033.

(c) Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent

emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of § 264.1034(c).

(d) When an owner or operator and the Regional Administrator do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the procedures in § 264.1034(c) shall be used to resolve the disagreement.

§ 264.1033 Standards: Closed-vent systems and control devices.

(a)(1) Owners or operators of closed-vent systems and control devices used to comply with provisions of this part shall comply with the provisions of this section.

(2) The owner or operator of an existing facility who cannot install a closed-vent system and control device to comply with the provisions of this subpart on the effective date that the facility becomes subject to the provisions of this subpart must prepare an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The controls must be installed as soon as possible, but the implementation schedule may allow up to 18 months after the effective date that the facility becomes subject to this subpart for installation and startup. All units that begin operation after December 21, 1990, must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 2-year implementation schedule does not apply to these units.

(b) A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95 weight percent or greater unless the total organic emission limits of § 264.1032(a)(1) for all affected process vents can be attained at an efficiency less than 95 weight percent.

(c) An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall be designed and operated to reduce the organic emis-

sions vented to it by 95 weight percent or greater; to achieve a total organic compound concentration of 20 ppmv, expressed as the sum of the actual compounds, not carbon equivalents, on a dry basis corrected to 3 percent oxygen; or to provide a minimum residence time of 0.60 seconds at a minimum temperature of 760 °C. If a boiler or process heater is used as the control device, then the vent stream shall be introduced into the flame zone of the boiler or process heater.

(d)(1) A flare shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (e)(1) of this section, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) A flare shall be operated with a flame present at all times, as determined by the methods specified in paragraph (e)(2)(ii) of this section.

(3) A flare shall be used only if the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater. If the flare is steam-assisted or air-assisted; or if the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater; if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (e)(2) of this section.

(4)(i) A steam-assisted or nonassisted flare shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than 18.3 m/s (60 ft/s), except as provided in paragraphs (d)(4) (ii) and (iii) of this section.

(ii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, equal to or greater than 18.3 m/s (60 ft/s) but less than 122 m/s (400 ft/s) is allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than the velocity, V_{max} , as determined by the method specified in paragraph (e)(4) of this section

tion and less than 122 m/s (400 ft/s) is allowed.

(5) An air-assisted flare shall be designed and operated with an exit velocity less than the velocity, V_{max} , as determined by the method specified in paragraph (e)(5) of this section.

(6) A flare used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(e)(1) Reference Method 22 in 40 CFR part 60 shall be used to determine the compliance of a flare with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_T = K \left[\sum_{i=1}^n C_i H_i \right]$$

where:

H_T = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 °C;

K = Constant, 1.74×10^{-7} (Uppm) (g mol/scm) (MJ/kcal) where standard temperature for (g mol/scm) is 20 °C;

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 18 in 40 CFR part 60 and measured for hydrogen and carbon monoxide by ASTM D 1946-93 (incorporated by reference as specified in § 260.11); and

H_i = Net heat of combustion of sample component i , kcal/g mol at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D 2382-93 (incorporated by reference as specified in § 260.11) if published values are not available or cannot be calculated.

(3) The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D in 40 CFR part 60 as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

(4) The maximum allowed velocity in m/s, V_{max} , for a flare complying with paragraph (d)(4)(iii) of this section

shall be determined by the following equation:

$$\text{Log}_{10}(V_{\text{max}}) = (H_T + 28.9)/31.7$$

where:

28.9=Constant,

31.7=Constant,

H_T =The net heating value as determined in paragraph (e)(2) of this section.

(5) The maximum allowed velocity in m/s, V_{max} , for an air-assisted flare shall be determined by the following equation:

$$V_{\text{max}} = 8.706 + 0.704 (H_T)$$

where:

8.706=Constant,

0.704=Constant,

H_T =The net heating value as determined in paragraph (e)(2) of this section.

(f) The owner or operator shall monitor and inspect each control device required to comply with this section to ensure proper operation and maintenance of the control device by implementing the following requirements:

(1) Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control device inlet but before the point at which the vent streams are combined.

(2) Install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor control device operation as specified below:

(i) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

(ii) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. One tem-

perature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed outlet.

(iii) For a flare, a heat sensing monitoring device equipped with a continuous recorder that indicates the continuous ignition of the pilot flame.

(iv) For a boiler or process heater having a design heat input capacity less than 44 MW, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the furnace downstream of the combustion zone.

(v) For a boiler or process heater having a design heat input capacity greater than or equal to 44 MW, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.

(vi) For a condenser, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the condenser, or

(B) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. One temperature sensor shall be installed at a location in the exhaust vent stream from the condenser, and a second temperature sensor shall be installed at a location in the coolant fluid exiting the condenser.

(vii) For a carbon adsorption system that regenerates the carbon bed directly in the control device such as a fixed-bed carbon adsorber, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the carbon bed, or

(B) A monitoring device equipped with a continuous recorder to measure

a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.

(3) Inspect the readings from each monitoring device required by paragraphs (D)(1) and (2) of this section at least once each operating day to check control device operation and, if necessary, immediately implement the corrective measures necessary to ensure the control device operates in compliance with the requirements of this section.

(g) An owner or operator using a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of § 264.1035(b)(4)(ii)(F).

(h) An owner or operator using a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon on a regular basis by using one of the following procedures:

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule, and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of § 264.1035(b)(4)(iii)(G), whichever is longer.

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of § 264.1035(b)(4)(iii)(G).

(i) An alternative operational or process parameter may be monitored if it can be demonstrated that another parameter will ensure that the control device is operated in conformance with these standards and the control device's design specifications.

(j) An owner or operator of an affected facility seeking to comply with the provisions of this part by using a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system is required to develop documentation including sufficient information to describe the control device operation and identify the process parameter or parameters that indicate proper operation and maintenance of the control device.

(k)(1) Closed-vent systems shall be designed for and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background and by visual inspections, as determined by the methods specified as § 264.1034(b).

(2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring, which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator. For the annual leak detection monitoring after the initial leak detection monitoring, the owner or operator is not required to monitor those closed-vent system components which operate in vacuum service or those closed-vent system joints, seams, or other connections that are permanently or semi-permanently sealed (e.g., a welded joint between two sections of metal pipe or a bolted and gasketed pipe flange).

(3) Detectable emissions, as indicated by an instrument reading greater than 500 ppm and visual inspections, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected.

(4) A first attempt at repair shall be made no later than 5 calendar days after the emission is detected.

(l) Closed-vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

(m) The owner or operator using a carbon adsorption system shall document that all carbon removed from a carbon adsorption system to comply

sample is accidentally lost or conditions occur in which one of the three runs must be discontinued because of forced shutdown, failure of an irreparable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Regional Administrator's approval, be determined using the average of the results of the two other runs.

(d) To show that a process vent associated with a hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation is not subject to the requirements of this subpart, the owner or operator must make an initial determination that the time-weighted, annual average total organic concentration of the waste managed by the waste management unit is less than 10 ppmw using one of the following two methods:

- (i) Direct measurement of the organic concentration of the waste using the following procedures:
 - (1) The owner or operator must take a minimum of four grab samples of waste for each waste stream managed in the affected unit under process conditions expected to cause the maximum waste organic concentration.
 - (ii) For waste generated onsite, the grab samples must be collected at a point before the waste is exposed to the atmosphere such as in an enclosed pipe or other closed system that is used to transfer the waste after generation to the first affected distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation. For waste generated offsite, the grab samples must be collected at the inlet to the first waste management unit that receives the waste provided the waste has been transferred to the facility in a closed system such as a tank truck and the waste is not diluted or mixed with other waste.
 - (iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060 or 8240 of SW-846 (incorporated by reference under §260.11).
 - (iv) The arithmetic mean of the results of the analyses of the four samples shall apply for each waste stream

where:
 E_a = Total organic mass flow rate, kg/h;
 Q_a = Volumetric flow rate of gases entering or exiting control device, as determined by Method 2, dscm/h;
 n = Number of organic compounds in the vent gas;
 C_i = Organic concentration in ppm, dry basis, of compound i in the vent gas, as determined by Method 18;
 MW_i = Molecular weight of organic compound i in the vent gas, kg/kg-mol;
 0.0416 = Conversion factor for molar volume, kg-mol/m³ @ 293 K and 760 mm Hg;
 10^{-6} = Conversion from ppm, ppm⁻¹.

(v) The annual total organic emission rate shall be determined by the following equation:

$$E_a = (E_a)(H)$$

where:
 E_a = Total organic mass emission rate, kg/y;
 E_a = Total organic mass flow rate for the process vent, kg/h;
 H = Total annual hours of operations for the affected unit, h.

- (vi) Total organic emissions from all affected process vents at the facility shall be determined by summing the hourly total organic mass emission rates (E_a) as determined in paragraph (c)(1)(iv) of this section and by summing the annual total organic mass emission rates (E_a) as determined in paragraph (c)(1)(v) of this section for all affected process vents at the facility.
- (2) The owner or operator shall record such process information as may be necessary to determine 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.
- (3) The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as follows:
 - (i) Sampling ports adequate for the test methods specified in paragraph (c)(1) of this section.
 - (ii) Safe sampling platform(s).
 - (iii) Safe access to sampling platform(s).
 - (iv) Utilities for sampling and testing equipment.
 - (4) For the purpose of making compliance determinations, the time-weighted average of the results of the three runs shall apply. In the event that a

- (4) Calibration gases shall be:
 - (i) Zero air (less than 10 ppm of hydrocarbon in air).
 - (ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.
 - (5) The background level shall be determined as set forth in Reference Method 21.
 - (6) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.
 - (7) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.
 - (c) Performance tests to determine compliance with §264.1032(a) and with the total organic compound concentration limit of §264.1033(c) shall comply with the following:
 - (i) Performance tests to determine total organic compound concentrations and mass flow rates entering and exiting control devices shall be conducted and data reduced in accordance with the following reference methods and calculation procedures:
 - (1) Method 2 in 40 CFR part 60 for velocity and volumetric flow rate.
 - (ii) Method 18 in 40 CFR part 60 for organic content.
 - (iii) Each performance test shall consist of three separate runs; each run conducted for at least 1 hour under the conditions that exist when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. For the purpose of determining total organic compound concentrations and mass flow rates, the average of results of all runs shall apply. The average shall be computed on a time-weighted basis.
 - (iv) Total organic mass flow rates shall be determined by the following equation:

$$E_a = Q_a \left\{ \sum_{i=1}^n C_{MW_i} \right\} [0.0416] (10^{-6})$$

with §264.1033(g) and §264.1033(h) is managed in one of the following manners:

- (1) Regenerated or reactivated in a thermal treatment unit that is permitted under subpart X of this part;
- (2) Incinerated by a process that is permitted under subpart O of this part; or
- (3) Burned in a boiler or industrial furnace that is permitted under subpart H of part 266 of this chapter.

[55 FR 25494, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991; 59 FR 6297, Dec. 6, 1994]

EFFECTIVE DATE NOTE: At 59 FR 6297, Dec. 6, 1994, in §264.1033, paragraph (k)(2) was revised and paragraph (m) was added. At 60 FR 26928, May 19, 1995, the effective date was delayed to December 6, 1995. For the convenience of the reader, the superseded material is printed below.

§264.1033 Standards: Closed-vent systems and control devices.

- (k)(1) * * *
- (2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring, which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator.

§264.1034 Test methods and procedures.

- (a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.
- (b) When a closed-vent system is tested for compliance with no detectable emissions, as required in §264.1033(k), the test shall comply with the following requirements:
 - (1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.
 - (2) The detection instrument shall meet the performance criteria of Reference Method 21.
 - (3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

managed in the unit in determining the time-weighted, annual average total organic concentration of the waste. The time-weighted average is to be calculated using the annual quantity of each waste stream processed and the mean organic concentration of each waste stream managed in the unit.

(2) Using knowledge of the waste to determine that its total organic concentration is less than 10 ppmw. Documentation of the waste determination is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to generate a waste stream having a total organic content less than 10 ppmw, or prior specification analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) The determination that distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations manage hazardous wastes with time-weighted, annual average total organic concentrations less than 10 ppmw shall be made as follows:

(1) By the effective date that the facility becomes subject to the provisions of this subpart or by the date when the waste is first managed in a waste management unit, whichever is later, and

(2) For continuously generated waste, annually, or

(3) Whenever there is a change in the waste being managed or a change in the process that generates or treats the waste.

(f) When an owner or operator and the Regional Administrator do not agree on whether a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation manages a hazardous waste with organic concentrations of at least 10 ppmw based on knowledge of

the waste, the procedures in Method 8240 may be used to resolve the dispute.

§ 264.1035 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For facilities that comply with the provisions of § 264.1033(a)(2), an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The schedule must also include a rationale of why the installation cannot be completed at an earlier date. The implementation schedule must be in the facility operating record by the effective date that the facility becomes subject to the provisions of this subpart.

(2) Up-to-date documentation of compliance with the process vent standards in § 264.1032, including:

(i) Information and data identifying all affected process vents, annual throughput and operating hours of each affected unit, estimated emission rates for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility), and the approximate location within the facility of each affected unit (e.g., identify the hazardous waste management units on a facility plot plan).

(ii) Information and data supporting determinations of vent emissions and emission reductions achieved by add-on control devices based on engineering calculations or source tests. For the purpose of determining compliance, determinations of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates, or vent

stream organic compounds and concentrations) that represent the conditions that result in maximum organic emissions, such as when the waste management unit is operating at the highest load or capacity level reasonably expected to occur. If the owner or operator takes any action (e.g., managing a waste of different composition or increasing operating hours of affected waste management units) that would result in an increase in total organic emissions from affected process vents at the facility, then a new determination is required.

(3) Where an owner or operator chooses to use test data to determine the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan. The test plan must include:

(i) A description of how it is determined that the planned test is going to be conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. This shall include the estimated or design flow rate and organic content of each vent stream and define the acceptable operating ranges of key process and control device parameters during the test program.

(ii) A detailed engineering description of the closed-vent system and control device including:

(A) Manufacturer's name and model number of control device.

(B) Type of control device.

(C) Dimensions of the control device.

(D) Capacity.

(E) Construction materials.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(4) Documentation of compliance with § 264.1033 shall include the following information:

(i) A list of all information references and sources used in preparing the documentation.

(ii) Records, including the dates, of each compliance test required by § 264.1033(k).

(iii) If engineering calculations are used, a design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "API Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. Documentation provided by the control device manufacturer or vendor that describes the control device design in accordance with paragraphs (b)(4)(ii)(A) through (b)(4)(ii)(G) of this section may be used to comply with this requirement. The design analysis shall address the vent stream characteristics and control device operation parameters as specified below.

(A) For a thermal vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

(B) For a catalytic vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature across the catalyst bed inlet and outlet.

(C) For a boiler or process heater, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average flame zone temperatures, combustion zone residence time, and description of method and location where the vent stream is introduced into the combustion zone.

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in § 264.1033(d).

(E) For a condenser, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic

compound concentration level, design average temperature of the condenser exhaust vent stream, and design average temperatures of the coolant fluid at the condenser inlet and outlet.

(F) For a carbon adsorption system such as a fixed-bed adsorber that regenerates the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level, number and capacity of carbon beds, type and working capacity of activated carbon used for carbon beds, design total steam flow over the period of each complete carbon bed regeneration cycle, duration of the carbon bed steaming and cooling/drying cycles, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of carbon.

(G) For a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic concentration level, capacity of carbon bed, type and working capacity of activated carbon used for carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule.

(iv) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(v) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 percent or greater unless the total organic concentration limit of \$ 264.1032(a) is achieved at an efficiency less than 95 weight percent or the total organic

emission limits of \$ 264.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent. A statement provided by the control device manufacturer or vendor certifying that the control equipment meets the design specifications may be used to comply with this requirement.

(vi) If performance tests are used to demonstrate compliance, all test results.

(c) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of this part shall be recorded and kept up-to-date in the facility operating record. The information shall include:

(1) Description and date of each modification that is made to the closed-vent system or control device design.

(2) Identification of operating parameter, description of monitoring device, and diagram of monitoring sensor location or locations used to comply with \$ 264.1033 (f)(1) and (f)(2).

(3) Monitoring, operating, and inspection information required by paragraphs (f) through (k) of \$ 264.1033.

(4) Date, time, and duration of each period that occurs while the control device is operating when any monitored parameter exceeds the value established in the control device design analysis as specified below:

(i) For a thermal vapor incinerator designed to operate with a minimum residence time of 0.50 second at a minimum temperature of 760 °C, period when the combustion temperature is below 760 °C.

(ii) For a thermal vapor incinerator designed to operate with an organic emission reduction efficiency of 95 weight percent or greater period when the combustion zone temperature is more than 28 °C below the design average combustion zone temperature established as a requirement of paragraph (b)(4)(iii)(A) of this section.

(iii) For a catalytic vapor incinerator, period when:

(A) Temperature of the vent stream at the catalyst bed inlet is more than 28 °C below the average temperature of

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the inlet vent stream established as a requirement of paragraph (b)(4)(iii)(B) of this section, or

(B) Temperature difference across the catalyst bed is less than 80 percent of the design average temperature difference established as a requirement of paragraph (b)(4)(iii)(B) of this section.

(iv) For a boiler or process heater, period when:

(A) Flame zone temperature is more than 28 °C below the design average flame zone temperature established as a requirement of paragraph (b)(4)(iii)(C) of this section, or

(B) Position changes where the vent stream is introduced to the combustion zone from the location established as a requirement of paragraph (b)(4)(iii)(C) of this section.

(v) For a flare, period when the pilot flame is not ignited.

(vi) For a condenser that complies with \$ 264.1033(f)(2)(vi)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the condenser are more than 20 percent greater than the design outlet organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(vii) For a condenser that complies with \$ 264.1033(f)(2)(vi)(B), period when:

(A) Temperature of the exhaust vent stream from the condenser is more than 6 °C above the design average exhaust vent stream temperature established as a requirement of paragraph (b)(4)(iii)(E) of this section; or

(B) Temperature of the coolant fluid exiting the condenser is more than 6 °C above the design average coolant fluid temperature at the condenser outlet established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(viii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with \$ 264.1033(f)(2)(vii)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the carbon bed are more than 20 percent greater than the design exhaust vent stream organic compound concentration level established as a re-

quirement of paragraph (b)(4)(iii)(F) of this section.

(ix) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with \$ 264.1033(f)(2)(vii)(B), period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(5) Explanation for each period recorded under paragraph (4) of the cause for control device operating parameter exceeding the design value and the measures implemented to correct the control device operation.

(6) For a carbon adsorption system operated subject to requirements specified in \$ 264.1033(g) or \$ 264.1033(h)(2), date when existing carbon in the control device is replaced with fresh carbon.

(7) For a carbon adsorption system operated subject to requirements specified in \$ 264.1033(h)(1), a log that records:

(i) Date and time when control device is monitored for carbon breakthrough and the monitoring device reading.

(ii) Date when existing carbon in the control device is replaced with fresh carbon.

(8) Date of each control device start-up and shutdown.

(d) Records of the monitoring, operating, and inspection information required by paragraphs (c)(3)-(c)(8) of this section need be kept only 3 years.

(e) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, the Regional Administrator will specify the appropriate record-keeping requirements.

(f) Up-to-date information and data used to determine whether or not a process vent is subject to the requirements in \$ 264.1032 including supporting documentation as required by \$ 264.1034(d)(2) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used, shall be

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recorded in a log that is kept in the facility operating record.

[55 FR 25494, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 264.1036 Reporting requirements.

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Regional Administrator by dates specified by the Regional Administrator. The report shall include the following information:

(1) The Environmental Protection Agency identification number, name, and address of the facility.

(2) For each month during the semiannual reporting period, dates when the control device exceeded or operated outside of the design specifications as defined in § 264.1035(c)(4) and as indicated by the control device monitoring required by § 264.1033(f) and such exceedances were not corrected within 24 hours, or that a flare operated with visible emissions as defined in § 264.1033(d) and as determined by Method 22 monitoring, the duration and cause of each exceedance or visible emissions, and any corrective measures taken.

(b) If, during the semiannual reporting period, the control device does not exceed or operate outside of the design specifications as defined in § 264.1035(c)(4) for more than 24 hours or a flare does not operate with visible emissions as defined in § 264.1033(d), a report to the Regional Administrator is not required.

§ 264.1037—264.1049 [Reserved]

Subpart BB—Air Emission Standards for Equipment Leaks

Source: 55 FR 25501, June 21, 1990, unless otherwise noted.

§ 264.1060 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 264.1).

(b) Except as provided in § 264.1064(k), this subpart applies to equipment that contains or contacts hazardous wastes with organic concentrations of at least

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10 percent by weight that are managed in:

(1) Units that are subject to the permitting requirements of part 270, or

(2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

(c) If the owner or operator of equipment subject to the requirements of §§ 264.1052 through 264.1065 has received a permit under section 3005 of RCRA prior to December 21, 1990, the requirements of §§ 264.1052 through 264.1065 must be incorporated when the permit is reissued under § 124.15 or reviewed under § 270.50.

(d) Each piece of equipment to which this subpart applies shall be marked in such a manner that it can be distinguished readily from other pieces of equipment.

(e) Equipment that is in vacuum service is excluded from the requirements of § 264.1052 to § 264.1060 if it is identified as required in § 264.1064(g)(5).

[NOTE: The requirements of §§ 264.1052 through 264.1065 apply to equipment associated with hazardous waste recycling units previously exempt under § 261.6(c)(1). Other exemptions under §§ 261.4, 262.34, and 264.1(g) are not affected by these requirements.]

§ 264.1051 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260-266.

§ 264.1052 Standards: Pumps in light liquid service.

(a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in § 264.1063(b), except as provided in paragraphs (d), (e), and (f) of this section.

(2) Each pump in light liquid service shall be checked by visual inspection each calendar week for indications of liquids dripping from the pump seal.

(b)(1) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(2) If there are indications of liquids dripping from the pump seal, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it

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is detected, except as provided in § 264.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(d) Each pump equipped with a dual mechanical seal system that includes a barrier fluid system is exempt from the requirements of paragraph (a) of this section, provided the following requirements are met:

(1) Each dual mechanical seal system must be:

(i) Operated with the barrier fluid at a pressure that is at all times greater than the pump stuffing box pressure, or

(ii) Equipped with a barrier fluid degassing reservoir that is connected by a closed-vent system to a control device that complies with the requirements of § 264.1060, or

(iii) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to the atmosphere.

(2) The barrier fluid system must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(3) Each barrier fluid system must be equipped with a sensor that will detect failure of the seal system, the barrier fluid system, or both.

(4) Each pump must be checked by visual inspection, each calendar week, for indications of liquids dripping from the pump seals.

(5)(i) Each sensor as described in paragraph (d)(3) of this section must be checked daily or be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly.

(ii) The owner or operator must determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(6)(i) If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in paragraph (d)(5)(ii) of this section, a leak is detected.

(ii) When a leak is detected, it shall be repaired as soon as practicable, but

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not later than 15 calendar days after it is detected, except as provided in § 264.1059.

(iii) A first attempt at repair (e.g., relapping the seal) shall be made no later than 5 calendar days after each leak is detected.

(e) Any pump that is designated, as described in § 264.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump meets the following requirements:

(1) Must have no externally actuated shaft penetrating the pump housing.

(2) Must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in § 264.1063(c).

(3) Must be tested for compliance with paragraph (e)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(f) If any pump is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of § 264.1060, it is exempt from the requirements of paragraphs (a) through (e) of this section.

[55 FR 25501, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 264.1053 Standards: Compressors.

(a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of total organic emissions to the atmosphere, except as provided in paragraphs (h) and (i) of this section.

(b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is at all times greater than the compressor stuffing box pressure, or

(2) Equipped with a barrier fluid system that is connected by a closed-vent system to a control device that complies with the requirements of § 264.1060, or

(3) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to atmosphere.

(c) The barrier fluid must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(d) Each barrier fluid system as described in paragraphs (a) through (c) of this section shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly unless the compressor is located within the boundary of an unattended plant site, in which case the sensor must be checked daily.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(f) If the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 264.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of § 264.1060, except as provided in paragraph (i) of this section.

(i) Any compressor that is designated, as described in § 264.1064(g)(2), for no detectable emissions as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is determined to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 264.1063(c).

(2) Is tested for compliance with paragraph (i)(1) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

§ 264.1054 Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 264.1063(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in § 264.1059.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 264.1063(c).

(c) Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in § 264.1060 is exempt from the requirements of paragraphs (a) and (b) of this section.

§ 264.1055 Standards: Sampling connecting systems.

(a) Each sampling connection system shall be equipped with a closed purge system or closed-vent system.

(b) Each closed-purge system or closed-vent system as required in paragraph (a) shall:

(1) Return the purged hazardous waste stream directly to the hazardous waste management process line with

no detectable emissions to atmosphere, or

(2) Collect and recycle the purged hazardous waste stream with no detectable emissions to atmosphere, or

(3) Be designed and operated to capture and transport all the purged hazardous waste stream to a control device that complies with the requirements of § 264.1060.

(c) *In situ* sampling systems are exempt from the requirements of paragraphs (a) and (b) of this section."

§ 264.1056 Standards: Open-ended valves or lines.

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve.

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring hazardous waste stream flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the hazardous waste stream end is closed before the second valve is closed.

(c) When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) of this section at all other times.

§ 264.1057 Standards: Valves in gas/vapor service or in light liquid service.

(a) Each valve in gas/vapor or light liquid service shall be monitored monthly to detect leaks by the methods specified in § 264.1063(b) and shall comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section, and §§ 264.1061 and 264.1062.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) Any valve for which a leak is not detected for two successive months may be monitored the first month of every succeeding quarter, beginning with the next quarter, until a leak is detected.

(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for two successive months.

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in § 264.1059.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

- (1) Tightening of bonnet bolts.
- (2) Replacement of packing gland nuts.
- (3) Tightening of packing gland nuts.
- (4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in § 264.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

(1) Has no external actuating mechanism in contact with the hazardous waste stream.

(2) Is operated with emissions less than 500 ppm above background as determined by the method specified in § 264.1063(c).

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(g) Any valve that is designated, as described in § 264.1064(h)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve is unsafe to monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section.

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in § 264.1064(h)(2), as a difficult-to-monitor valve is exempt from

the requirements of paragraph (a) of this section if:

- (1) The owner or operator of the valve determines that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.
- (2) The hazardous waste management unit within which the valve is located was in operation before June 21, 1990.
- (3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

§ 264.1058 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors.

- (a) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in § 264.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.
- (b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 264.1059.

- (2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under § 264.1057(e).

§ 264.1059 Standards: Delay of repair.

- (a) Delay of repair of equipment for which leaks have been detected will be allowed if the repair is technically infeasible without a hazardous waste management unit shutdown. In such a case, repair of this equipment shall occur before the end of the next hazardous waste management unit shutdown.
- (b) Delay of repair of equipment for which leaks have been detected will be allowed for equipment that is isolated from the hazardous waste management unit and that does not continue to con-

tain or contact hazardous waste with organic concentrations at least 10 percent by weight.

- (c) Delay of repair for valves will be allowed if:

- (1) The owner or operator determines that emissions of purged material resulting from immediate repair are greater than the emissions likely to result from delay of repair.
- (2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with § 264.1060.
- (d) Delay of repair for pumps will be allowed if:

- (1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system.
- (2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.
- (e) Delay of repair beyond a hazardous waste management unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the hazardous waste management unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next hazardous waste management unit shutdown will not be allowed unless the next hazardous waste management unit shutdown occurs sooner than 6 months after the first hazardous waste management unit shutdown.

§ 264.1060 Standards: Closed-vent systems and control devices.

Owners or operators of closed-vent systems and control devices shall comply with the provisions of § 264.1033.

§ 264.1061 Alternative standards for valves in gas/vapor service or in light liquid service: percentage of valves allowed to leak.

- (a) An owner or operator subject to the requirements of § 264.1057 may elect to have all valves within a hazardous waste management unit comply with an alternative standard that allows no greater than 2 percent of the valves to leak.
- (b) The following requirements shall be met if an owner or operator decides to comply with the alternative stand-

ard of allowing 2 percent of valves to leak:

- (1) An owner or operator must notify the Regional Administrator that the owner or operator has elected to comply with the requirements of this section.

(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Regional Administrator.

- (3) If a valve leak is detected, it shall be repaired in accordance with § 264.1057(d) and (e).

(c) Performance tests shall be conducted in the following manner:

- (1) All valves subject to the requirements in § 264.1057 within the hazardous waste management unit shall be monitored within 1 week by the methods specified in § 264.1053(b).

- (2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(3) The leak percentage shall be determined by dividing the number of valves subject to the requirements in § 264.1057 for which leaks are detected by the total number of valves subject to the requirements in § 264.1057 within the hazardous waste management unit.

- (d) If an owner or operator decides to comply with this section no longer, the owner or operator must notify the Regional Administrator in writing that the work practice standard described in § 264.1057(a) through (e) will be followed.

§ 264.1062 Alternative standards for valves in gas/vapor service or in light liquid service: skip period leak detection and repair.

- (a)(1) An owner or operator subject to the requirements of § 264.1057 may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of this section.

(2) An owner or operator must notify the Regional Administrator before implementing one of the alternative work practices.

- (b)(1) An owner or operator shall comply with the requirements for valves, as described in § 264.1057, except as described in paragraphs (b)(2) and (b)(3) of this section.

- (2) After two consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves subject to the requirements in § 264.1057.

(3) After five consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves subject to the requirements in § 264.1057.

- (4) If the percentage of valves leaking is greater than 2 percent, the owner or operator shall monitor monthly in compliance with the requirements in § 264.1057, but may again elect to use this section after meeting the requirements of § 264.1057(c)(1).

§ 264.1063 Test methods and procedures.

- (a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) Leak detection monitoring, as required in § 264.1052-264.1062, shall comply with the following requirements:

- (1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.
- (2) The detection instrument shall meet the performance criteria of Reference Method 21.

- (3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be:

- (i) Zero air (less than 10 ppm of hydrocarbon in air).
- (ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(5) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

- (c) When equipment is tested for compliance with no detectable emissions, as required in § 264.1052(e), § 264.1053(f), § 264.1054, and § 264.1057(f), the

test shall comply with the following requirements:

(1) The requirements of paragraphs (b)(1) through (4) of this section shall apply.

(2) The background level shall be determined as set forth in Reference Method 21.

(3) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(4) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) In accordance with the waste analysis plan required by § 264.13(b), an owner or operator of a facility must determine, for each piece of equipment, whether the equipment contains or contacts a hazardous waste with organic concentration that equals or exceeds 10 percent by weight using the following:

(1) Methods described in ASTM Methods D 2267-88, E 169-87, E 168-88, E 260-85 (incorporated by reference under § 260.11);

(2) Method 9060 or 8240 of SW-846 (incorporated by reference under § 260.11); or

(3) Application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced. Documentation of a waste determination by knowledge is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to have a total organic content less than 10 percent, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) If an owner or operator determines that a piece of equipment contains or contacts a hazardous waste

with organic concentrations at least 10 percent by weight, the determination can be revised only after following the procedures in paragraph (d)(1) or (d)(2) of this section.

(f) When an owner or operator and the Regional Administrator do not agree on whether a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the procedures in paragraph (d)(1) or (d)(2) of this section can be used to resolve the dispute.

(g) Samples used in determining the percent organic content shall be representative of the highest total organic content hazardous waste that is expected to be contained in or contact the equipment.

(h) To determine if pumps or valves are in light liquid service, the vapor pressures of constituents may be obtained from standard reference texts or may be determined by ASTM D-2879-86 (incorporated by reference under § 260.11).

(i) Performance tests to determine if a control device achieves 95 weight percent organic emission reduction shall comply with the procedures of § 264.1034(c)(1) through (c)(4).

§ 264.1064 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For each piece of equipment to which subpart BB of part 264 applies:

(i) Equipment identification number and hazardous waste management unit identification.

(ii) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

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(iii) Type of equipment (e.g., a pump or pipeline valve).

(iv) Percent-by-weight total organics in the hazardous waste stream at the equipment.

(v) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(vi) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(2) For facilities that comply with the provisions of § 264.1033(a)(2), an implementation schedule as specified in § 264.1033(a)(2).

(3) Where an owner or operator chooses to use test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(4) Documentation of compliance with § 264.1060, including the detailed design documentation or performance test results specified in § 264.1035(b)(4).

(c) When each leak is detected as specified in §§ 264.1052, 264.1053, 264.1057, and 264.1058, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, the date evidence of a potential leak was found in accordance with § 264.1058(a), and the date the leak was detected, shall be attached to the leaking equipment.

(2) The identification on equipment, except on a valve, may be removed after it has been repaired.

(3) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in §§ 264.1057(c) and no leak has been detected during those 2 months.

(d) When each leak is detected as specified in §§ 264.1052, 264.1053, 264.1057, and 264.1058, the following information shall be recorded in an inspection log and shall be kept in the facility operating record:

(1) The instrument and operator identification numbers and the equipment identification number.

(2) The date evidence of a potential leak was found in accordance with § 264.1058(a).

(3) The date the leak was detected and the dates of each attempt to repair the leak.

(4) Repair methods applied in each attempt to repair the leak.

(5) "Above 10,000" if the maximum instrument reading measured by the methods specified in § 264.1053(b) after each repair attempt is equal to or greater than 10,000 ppm.

(6) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(7) Documentation supporting the delay of repair of a valve in compliance with § 264.1059(c).

(8) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a hazardous waste management unit shutdown.

(9) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days.

(10) The date of successful repair of the leak.

(e) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of § 264.1060 shall be recorded and kept up-to-date in the facility operating record as specified in § 264.1035(c). Design documentation is specified in § 264.1035 (c)(1) and (c)(2) and monitoring, operating, and inspection information in § 264.1035 (c)(3)-(c)(8).

(f) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, the Regional Administrator will specify the appropriate recordkeeping requirements.

(g) The following information pertaining to all equipment subject to the requirements in §§ 264.1052 through 264.1060 shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for equipment (except welded fittings) subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions, as indicated by an in-

strument reading of less than 500 ppm above background, under the provisions of §§ 264.1052(e), 264.1053(i), and 264.1057(f).

(ii) The designation of this equipment as subject to the requirements of §§ 264.1052(e), 264.1053(i), or 264.1057(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with § 264.1054(a).

(4)(i) The dates of each compliance test required in §§ 264.1052(e), 264.1053(i), 264.1054, and 264.1057(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(h) The following information pertaining to all valves subject to the requirements of § 264.1057 (g) and (h) shall be recorded in a log that is kept in the facility operating record:

(i) A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

(2) A list of identification numbers for valves that are designated as difficult to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.

(i) The following information shall be recorded in the facility operating record for valves complying with § 264.1062:

(1) A schedule of monitoring.

(2) The percent of valves found leaking during each monitoring period.

(j) The following information shall be recorded in a log that is kept in the facility operating record:

(i) Criteria required in § 264.1052(d)(5)(ii) and § 264.1053(e)(2) and an explanation of the design criteria.

(2) Any changes to these criteria and the reasons for the changes.

(k) The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions as provided in

the applicability section of this subpart and other specific subparts:

(1) An analysis determining the design capacity of the hazardous waste management unit.

(2) A statement listing the hazardous waste influent to and effluent from each hazardous waste management unit subject to the requirements in §§ 264.1052 through 264.1060 and an analysis determining whether these hazardous wastes are heavy liquids.

(3) An up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements in §§ 264.1052 through 264.1060. The record shall include supporting documentation as required by § 264.1063(d)(3) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used. If the owner or operator takes any action (e.g., changing the process that produced the waste) that could result in an increase in the total organic content of the waste contained in or contacted by equipment determined not to be subject to the requirements in §§ 264.1052 through 264.1060, then a new determination is required.

(i) Records of the equipment leak information required by paragraph (d) of this section and the operating information required by paragraph (e) of this section need be kept only 3 years.

(m) The owner or operator of any facility that is subject to this subpart and to regulations at 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to determine compliance with this subpart by documentation elsewhere pursuant to § 264.1064 of this subpart, or pursuant to those provisions of 40 CFR part 60 or 61, to the extent that the documentation under the regulation at 40 CFR part 60 or part 61 duplicates the documentation required under this subpart. The documentation under the regulation at 40 CFR part 60 or part 61 shall be kept with or made readily available with the facility operating record.

§ 264.1065 Reporting requirements.

(a) A semiannual report shall be submitted by owners and operators subject to the requirements of this subpart to the Regional Administrator by dates

specified by the Regional Administrator. The report shall include the following information:

(1) The Environmental Protection Agency identification number, name, and address of the facility.

(2) For each month during the semiannual reporting period:

(i) The equipment identification number of each valve for which a leak was not repaired as required in § 264.1057(d).

(ii) The equipment identification number of each pump for which a leak was not repaired as required in § 264.1052 (c) and (d)(6).

(iii) The equipment identification number of each compressor for which a leak was not repaired as required in § 264.1053(g).

(3) Dates of hazardous waste management unit shutdowns that occurred within the semiannual reporting period.

(4) For each month during the semiannual reporting period, dates when the control device installed as required by § 264.1052, 264.1053, 264.1054, or 264.1055 exceeded or operated outside of the design specifications as defined in § 264.1064(e) and as indicated by the control device monitoring required by § 264.1060 and was not corrected within 24 hours, the duration and cause of each exceedance, and any corrective measures taken.

(b) If, during the semiannual reporting period, leaks from valves, pumps, and compressors are repaired as required in §§ 264.1057 (d), 264.1052 (c) and (d)(6), and 264.1053 (g), respectively, and the control device does not exceed or operate outside of the design specifications as defined in § 264.1064(e) for more than 24 hours, a report to the Regional Administrator is not required.

§ 264.1066—264.1079 [Reserved]

Subpart CC—Air Emission Standards for Tanks, Surface Impoundments, and Containers

SOURCE: 59 FR 6297, Dec. 6, 1994, unless otherwise noted.

EFFECTIVE DATE NOTE: At 59 FR 6297, Dec. 6, 1994, Subpart CC, consisting of §§ 264.1080 through 264.1091 was added. At 60 FR 26828,

May 19, 1995, the effective date was delayed to December 6, 1995.

§ 264.1080 Applicability.

(a) The requirements of this subpart apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either subparts I, J, or K of this part except as § 264.1 and paragraph (b) of this section provide otherwise.

(b) The requirements of this subpart do not apply to the following waste management units at the facility:

(1) A waste management unit that holds hazardous waste placed in the unit before December 6, 1995, and in which no hazardous waste is added to the unit on or after this date.

(2) A container that has a design capacity less than or equal to 0.1 m³.

(3) A tank in which an owner or operator has stopped adding hazardous waste and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

(4) A surface impoundment in which an owner or operator has stopped adding hazardous waste (except to implement an approved closure plan) and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

(5) A waste management unit that is used solely for on-site treatment or storage of hazardous waste that is generated as the result of implementing remedial activities required under the corrective action authorities of RCRA sections 3004(u), 3004(v) or 3008(b), CERCLA authorities, or similar Federal or State authorities.

(6) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.

(c) For the owner and operator of a facility subject to this subpart and who received a final permit under RCRA section 3005 prior to December 6, 1995, the requirements of this subpart shall be incorporated into the permit when the permit is reissued in accordance with the requirements of § 124.15 of this chapter or reviewed in accordance with

the requirements of § 270.50(d) of this chapter. Until such date when the owner and operator receives a final permit incorporating the requirements of this subpart, the owner and operator is subject to the requirements of 40 CFR part 265 subpart CC.

[50 FR 62927, Dec. 6, 1994, as amended at 60 FR 28828, May 19, 1995]

EFFECTIVE DATE NOTE: At 60 FR 28828, May 19, 1995, in § 264.1080, paragraphs (b)(1) and (c) were revised, effective December 6, 1995. For the convenience of the reader, the superseded material is set out below.

§ 264.1080 Applicability.

(1) A waste management unit that holds hazardous waste placed in the unit before June 6, 1995, and in which no hazardous waste is added to the unit on or after June 5, 1995.

(c) For the owner and operator of a facility subject to this subpart and who received a final permit under RCRA section 3005 prior to June 6, 1995, the requirements of this subpart shall be incorporated into the permit when the permit is renewed in accordance with the requirements of 40 CFR 124.15 or reviewed in accordance with the requirements of 40 CFR 270.50(d). Until such date when the owner and operator receives a final permit incorporating the requirements of this subpart, the owner and operator is subject to the requirements of 40 CFR part 265, subpart CC.

§ 264.1081 Definitions.

As used in this subpart, all terms shall have the meaning given to them in 40 CFR 265.1081, the Act, and parts 260 through 266 of this chapter.

§ 264.1082 Standards: General.

(a) This section applies to the management of hazardous waste in tanks, surface impoundments, and containers subject to this subpart.

(b) The owner or operator shall control air emissions from each waste management unit in accordance with standards specified in §§ 264.1084 through 264.1087 of this subpart, as applicable to the waste management unit, except as provided for in paragraph (c) of this section.

using the procedures specified in § 264.1083(b) of this subpart.

(iv) A biological process that destroys or degrades the organics contained in the hazardous waste, such that either of the following conditions is met:

(A) The organic reduction efficiency (R) for the process is equal to or greater than 95 percent, and the organic biodegradation efficiency (R_{bio}) for the process is equal to or greater than 95 percent. The organic reduction efficiency and the organic biodegradation efficiency for the process shall be determined in accordance with the procedures specified in § 264.1083(b) of this subpart.

(B) The total actual organic mass biodegradation rate (MR_{bio}) for all hazardous waste treated by the process is equal to or greater than the required organic mass removal rate (RMR). The required organic mass removal rate and the actual organic mass biodegradation rate for the process shall be determined using the procedures specified in § 264.1083(b) of this subpart.

(v) A process that removes or destroys the organics contained in the hazardous waste and meets all of the following conditions:

(A) All of the materials entering the process are hazardous wastes.

(B) From the point of waste origination through the point where the hazardous waste enters the process, the hazardous waste is continuously managed in waste management units which use air emission controls in accordance with the standards specified in §§ 264.1084 through 264.1087 of this subpart, as applicable to the waste management unit.

(C) The average VO concentration of the hazardous waste at the point of waste treatment is less than the lowest average VO concentration at the point of waste origination determined for each of the individual hazardous waste streams entering the process or 100 ppmw, whichever value is lower. The average VO concentration of each individual hazardous waste stream at the point of waste origination shall be determined using the procedure specified in § 264.1083(a) of this subpart. The average VO concentration of the hazardous

ous waste at the point of waste treatment shall be determined using the procedure specified in § 264.1083(b) of this subpart.

(vi) A hazardous waste incinerator for which the owner or operator has elected:

(A) Been issued a final permit under 40 CFR part 270, and designs and operates the unit in accordance with the requirements of subpart O of this part; or

(B) Has certified compliance with the interim status requirements of 40 CFR part 265, subpart O.

(vii) A boiler or industrial furnace for which the owner or operator has elected:

(A) Been issued a final permit under 40 CFR part 270, and designs and operates the unit in accordance with the requirements of 40 CFR part 266, subpart H; or

(B) Has certified compliance with the interim status requirements of 40 CFR part 266, subpart H.

(d) When a process is used for the purpose of treating a hazardous waste to meet one of the sets of conditions specified in paragraphs (c)(2)(i) through (c)(2)(v) of this section, each material removed from or exiting the process that is not a hazardous waste but has an average VO concentration equal to or greater than 100 ppmw shall be managed in a waste management unit in accordance with the requirements of paragraph (b) of this section.

(e) The Regional Administrator may at any time perform or request that the owner or operator perform a waste determination for a hazardous waste managed in a tank, surface impoundment, or container exempted from using air emission controls under the provisions of this section as follows:

(1) The waste determination for average VO concentration of a hazardous waste at the point of waste origination shall be performed using direct measurement in accordance with the applicable requirements of § 264.1083(a) of this subpart. The waste determination for a hazardous waste at the point of waste treatment shall be performed in accordance with the applicable requirements of § 264.1083(b) of this subpart.

(2) In a case when the owner or operator is requested to perform the waste determination, the Regional Administrator may elect to have an authorized

representative observe the collection of the hazardous waste samples used for the analysis.

(3) In a case when the results of the waste determination performed or requested by the Regional Administrator do not agree with the results of a waste determination performed by the owner or operator using knowledge of the waste, then the results of the waste determination performed in accordance with the requirements of paragraph (e)(1) of this section shall be used to establish compliance with the requirements of this subpart.

(4) In a case when the owner or operator has used an averaging period greater than 1 hour for determining the average VO concentration of a hazardous waste at the point of waste origination, the Regional Administrator may elect to establish compliance with this subpart by performing or requesting that the owner or operator perform a waste determination using direct measurement based on waste samples collected within a 1-hour period as follows:

(i) The average VO concentration of the hazardous waste at the point of waste origination shall be determined by direct measurements in accordance with the requirements of § 264.1083(a) of this subpart.

(ii) Results of the waste determination performed or requested by the Regional Administrator showing that the average VO concentration of the hazardous waste at the point of waste origination is equal to or greater than 100 ppmw shall constitute noncompliance with this subpart except in a case as provided for in paragraph (e)(4)(iii) of this section.

(iii) For the case when the average VO concentration of the hazardous waste at the point of waste origination previously has been determined by the owner or operator using an averaging period greater than 1 hour to be less than 100 ppmw but because of normal operating process variations the VO concentration of the hazardous waste determined by direct measurement for any given 1-hour period may be equal to or greater than 100 ppmw, information that was used by the owner or operator to determine the average VO concentration of the hazardous waste (e.g., test results, measurements, cal-

culations, and other documentation) and recorded in the facility records in accordance with the requirements of § 264.1083(a) and § 264.1089 of this subpart shall be considered by the Regional Administrator together with the results of the waste determination performed or requested by the Regional Administrator in establishing compliance with this subpart.

§ 264.1083 Waste determination procedures.

(a) Waste determination procedure for average volatile organic (VO) concentration of a hazardous waste at the point of waste origination.

(i) An owner or operator shall determine the average VO concentration at the point of waste origination for each hazardous waste placed in waste management units exempted under the provisions of § 264.1082(c)(1) of this subpart from using air emission controls in accordance with standards specified in § 264.1084 through § 264.1087 of this subpart, as applicable to the waste management unit.

(2) The VO concentration at the point of waste origination for a hazardous waste shall be determined in accordance with the procedures specified in 40 CFR 265.1084(a)(2) through (a)(6) of this chapter.

(b) Waste determination procedures for treated hazardous waste.

(i) An owner or operator shall perform the applicable waste determinations for each treated hazardous waste placed in waste management units exempted under the provisions of § 264.1082(c)(2) of this subpart from using air emission controls in accordance with standards specified in § 264.1084 through § 264.1087 of this subpart, as applicable to the waste management unit.

(2) The waste determination for a treated hazardous waste shall be performed in accordance with the procedures specified in 40 CFR 265.1084(b)(2) through (b)(10), as applicable to the treated hazardous waste.

(c) Procedure to determine the maximum organic vapor pressure of a hazardous waste in a tank.

(i) An owner or operator shall determine the maximum organic vapor pressure for each hazardous waste placed in

tanks using air emission controls in accordance with standards specified in § 264.1084(c) of this subpart.

(2) The maximum organic vapor pressure of the hazardous waste shall be determined in accordance with the procedures specified in 40 CFR 265.1084(c)(2) through (c)(4).

§ 264.1084 Standards: Tanks.

(a) This section applies to owners and operators of tanks subject to this subpart into which any hazardous waste is placed except for the following tanks:

(1) A tank in which all hazardous waste entering the tank meets the conditions specified in § 264.1082(c) of this subpart; or

(2) A tank used for biological treatment of hazardous waste in accordance with the requirements of § 264.1082(c)(4)(v) of this subpart.

(b) The owner or operator shall place the hazardous waste into one of the following tanks:

(1) A tank equipped with a cover (e.g., a fixed roof) that is vented through a closed-vent system to a control device in accordance with the requirements specified in paragraph (d) of this section;

(2) A tank equipped with a fixed roof and internal floating roof in accordance with the requirements of § 264.1091 of this subpart;

(3) A tank equipped with an external floating roof in accordance with the requirements of § 264.1091 of this subpart; or

(4) A pressure tank that is designed to operate as a closed system such that the tank operates with no detectable organic emissions at all times that hazardous waste is in the tank except as provided for in paragraph (g) of this section.

(c) As an alternative to complying with paragraph (b) of this section, an owner or operator may place hazardous waste in a tank equipped with a cover (e.g., a fixed roof) meeting the requirements specified in paragraph (d)(1) of this section when the hazardous waste is determined to meet all of the following conditions:

(1) The hazardous waste is neither mixed, stirred, agitated, nor circulated within the tank by the owner or operator using a process that results in

splashing, frothing, or visible turbulent flow on the waste surface during normal process operations;

(2) The hazardous waste in the tank is not heated by the owner or operator except during conditions requiring that the waste be heated to prevent the waste from freezing or to maintain adequate waste flow conditions for continuing normal process operations;

(3) The hazardous waste in the tank is not treated by the owner or operator using a waste stabilization process or a process that produces an exothermic reaction; and

(4) The maximum organic vapor pressure of the hazardous waste in the tank as determined using the procedure specified in § 264.1083(c) of this subpart is less than the following applicable value:

(i) If the tank design capacity is equal to or greater than 151 m³, then the maximum organic vapor pressure shall be less than 5.2 kPa;

(ii) If the tank design capacity is equal to or greater than 75 m³ but less than 151 m³, then the maximum organic vapor pressure shall be less than 27.6 kPa; or

(iii) If the tank design capacity is less than 75 m³, then the maximum organic vapor pressure shall be less than 76.6 kPa.

(d) To comply with paragraph (b)(1) of this section, the owner or operator shall design, install, operate, and maintain a cover that vents the organic vapors emitted from hazardous waste in the tank through a closed-vent system connected to a control device.

(1) The cover shall be designed and operated to meet the following requirements:

(i) The cover and all cover openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable organic emissions when all cover openings are secured in a closed, sealed position.

(ii) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the tank except as provided for in paragraph (f) of this section.

(2) The closed-vent system and control device shall be designed and oper-

ated in accordance with the requirements of § 264.1087 of this subpart.

(e) The owner and operator shall install, operate, and maintain enclosed pipes or other closed-systems, EPA considers a drain system that meets the requirements of 40 CFR 61.346(a)(1) or 40 CFR 61.346(b)(1) through (b)(3) to be a "closed system", to:

(1) Transfer all hazardous waste to the tank from another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in § 264.1082(c) of this subpart; and

(2) Transfer all hazardous waste from the tank to another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in § 264.1082(c) of this subpart.

(f) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid) at all times that hazardous waste is in the tank except when it is necessary to use the cover opening to:

(1) Add, remove, inspect, or sample the material in the tank;

(2) Inspect, maintain, repair, or replace equipment located inside the tank; or

(3) Vent gases or vapors from the tank to a closed-vent system connected to a control device that is designed and operated in accordance with the requirements of § 264.1087 of this subpart.

(g) One or more safety devices which vent directly to the atmosphere may be used on the tank, cover, closed-vent system, or control device provided each safety device meets all of the following conditions:

(1) The safety device is not used for planned or routine venting of organic vapors from the tank or closed-vent system connected to a control device; and

(2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the tank, cover, closed-vent system, or control device, in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an

unplanned event is a sudden power outage.

§ 264.1086 Standards: Surface impoundments.

(a) This section applies to owners and operators of surface impoundments subject to this subpart into which any hazardous waste is placed except for the following surface impoundments:

(1) A surface impoundment in which all hazardous waste entering the surface impoundment meets the conditions specified in § 264.1082(c) of this subpart; or

(2) A surface impoundment used for biological treatment of hazardous waste in accordance with the requirements of § 264.1082(c)(2)(iv) of this subpart.

(b) The owner or operator shall place the hazardous waste into a surface impoundment equipped with a cover (e.g., an air-supported structure or a rigid cover) that is vented through a closed-vent system to a control device meeting the requirements specified in paragraph (d) of this section.

(c) As an alternative to complying with paragraph (b) of this section, an owner or operator may place hazardous waste in a surface impoundment equipped with a floating membrane cover meeting the requirements specified in paragraph (e) of this section when the hazardous waste is determined to meet all of the following conditions:

(1) The hazardous waste is neither mixed, stirred, agitated, nor circulated within the surface impoundment by the owner or operator using a process that results in splashing, frothing, or visible turbulent flow on the waste surface during normal process operations;

(2) The hazardous waste in the surface impoundment is not heated by the owner or operator; and

(3) The hazardous waste is not treated by the owner or operator using a waste stabilization process or a process that produces an exothermic reaction.

(d) To comply with paragraph (b)(1) of this section, the owner or operator shall design, install, operate, and maintain a cover that vents the organic vapors emitted from hazardous waste in the surface impoundment through a

closed-vent system connected to a control device.

(1) The cover shall be designed and operated to meet the following requirements:

(i) The cover and all cover openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable organic emissions when all cover openings are secured in a closed, sealed position.

(ii) Each cover opening shall be secured in the closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the surface impoundment except as provided for in paragraph (g) of this section.

(iii) The closed-vent system and control device shall be designed and operated in accordance with § 264.1087 of this subpart.

(e) To comply with paragraph (c) of this section, the owner or operator shall design, install, operate, and maintain a floating membrane cover that meets all of the requirements specified in 40 CFR 265.1086(e)(1) through (e)(4).

(f) The owner or operator shall install, operate, and maintain enclosed pipes or other closed-systems, EPA considers a drain system that meets the requirements of 40 CFR 61.346(a)(1) or 40 CFR 61.346(b)(1) through (b)(3) to be a "closed system", to:

(1) Transfer all hazardous waste to the surface impoundment from another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in § 264.1082(c) of this subpart; and

(2) Transfer all hazardous waste from the surface impoundment to another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in § 264.1082(c) of this subpart.

(g) Each cover opening shall be secured in the closed, sealed position (e.g., a cover by a gasketed lid or cap) at all times that hazardous waste is in the surface impoundment except when it is necessary to use the cover opening to:

(1) Add, remove, inspect, or sample the material in the surface impoundment;

(2) Inspect, maintain, repair, or replace equipment located underneath the cover;

(3) Remove treatment residues from the surface impoundment in accordance with the requirements of 40 CFR 268.4; or

(4) Vent gases or vapors from the surface impoundment to a closed-vent system connected to a control device that is designed and operated in accordance with the requirements of § 264.1087 of this subpart.

(h) One or more safety devices that vent directly to the atmosphere may be installed on the cover, closed-vent system, or control device provided each device meets all of the following conditions:

(1) The safety device is not used for planned or routine venting of organic vapors from the surface impoundment or the closed-vent system connected to a control device; and

(2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the cover, closed-vent system, or control device in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an unplanned event is a sudden power outage.

§ 264.1086 Standards: Containers.

(a) This section applies to the owners and operators of containers having design capacities greater than 0.1 m³ subject to this subpart into which any hazardous waste is placed except for a container in which all hazardous waste entering the container meets the conditions specified in § 264.1082(c) of this subpart.

(b) An owner or operator shall manage hazardous waste in containers using the following procedures:

(1) The owner or operator shall place the hazardous waste into one of the following containers except when a container is used for hazardous waste treatment as required by paragraph (b)(2) of this section:

(i) A container that is equipped with a cover which operates with no detect-

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able organic emissions when all container openings (e.g., lids, bungs, hatches, and sampling ports) are secured in a closed, sealed position. The owner or operator shall determine that a container operates with no detectable emissions by testing each opening on the container for leaks in accordance with Method 21 in 40 CFR part 60, appendix A the first time any portion of the hazardous waste is placed into the container. If a leak is detected and cannot be repaired immediately, the hazardous waste shall be removed from the container and the container not used to meet the requirements of this paragraph until the leak is repaired and the container is retested.

(ii) A container having a design capacity less than or equal to 0.46 m³ that is equipped with a cover and complies with all applicable Department of Transportation regulations on packaging hazardous waste for transport under 49 CFR part 178.

(A) A container that is managed in accordance with the requirements of 49 CFR part 178 for the purpose of complying with this subpart is not subject to any exceptions to the 49 CFR part 178 regulations, except as noted in paragraph (b)(1)(i)(B) of this section.

(B) A lab pack that is managed in accordance with the requirements of 49 CFR part 178 for the purpose of complying with this subpart may comply with the exceptions for combination packagings specified in 49 CFR 173.12(b).

(iii) A container that is attached to or forms a part of any truck, trailer, or railcar, and that has been demonstrated within the preceding 12 months to be organic vapor tight when all container openings are in a closed, sealed position (e.g., the container hatches or lids are gasketed and latched). For the purpose of meeting the requirements of this paragraph, a container is organic vapor tight if the container sustains a pressure change of not more than 750 pascals within 5 minutes after it is pressurized to a minimum of 4,500 pascals. This condition is to be demonstrated using the pressure test specified in Method 27 of 40 CFR part 60, appendix A, and a pressure measurement device which has a precision of ±2.5 mm water and which is ca-

pable of measuring above the pressure at which the container is to be tested for vapor tightness.

(2) An owner or operator treating hazardous waste in a container by either a waste stabilization process, any process that requires the addition of heat to the waste, or any process that produces an exothermic reaction shall meet the following requirements:

(i) Whenever it is necessary for the container to be open during the treatment process, the container shall be located inside an enclosure that is vented through a closed-vent system to a control device.

(ii) The enclosure shall be a structure that is designed and operated in accordance with the following requirements:

(A) The enclosure shall be a structure that is designed and operated with sufficient airflow into the structure to capture the organic vapors emitted from the hazardous waste in the container and vent the vapors through the closed-vent system to the control device.

(B) The enclosure may have permanent or temporary openings to allow worker access; passage of containers through the enclosure by conveyor or other mechanical means; entry of permanent mechanical or electrical equipment; or to direct airflow into the enclosure. The pressure drop across each opening in the enclosure shall be maintained at a pressure below atmospheric pressure such that whenever an open container is placed inside the enclosure no organic vapors released from the container exit the enclosure through the opening. The owner or operator shall determine that an enclosure achieves this condition by measuring the pressure drop across each opening in the enclosure. If the pressure within the enclosure is equal to or greater than atmospheric pressure then the enclosure does not meet the requirements of this section.

(iii) The closed-vent system and control device shall be designed and operated in accordance with the requirements of § 264.1087 of this subpart.

(3) An owner or operator transferring hazardous waste into a container having a design capacity greater than 0.46

m³ shall meet the following requirements:

(i) Hazardous waste transfer by pumping shall be performed using a conveyance system that uses a tube (e.g., pipe, hose) to add the waste into the container. During transfer of the waste into the container, the cover shall remain in place and all container openings shall be maintained in a closed, sealed position except for those openings through which the tube enters the container and as provided for in paragraph (c) of this section. The tube shall be positioned in a manner such that either the:

(A) Tube outlet continuously remains submerged below the waste surface at all times waste is flowing through the tube;

(B) Lower bottom edge of the tube outlet is located at a distance no greater than two inside diameters of the tube or 15.25 cm, whichever distance is greater, from the bottom of the container at all times waste is flowing through the tube; or

(C) Tube is connected to a permanent port mounted on the bottom of the container so that the lower edge of the port opening inside the container is located at a distance equal to or less than 15.25 cm from the container bottom.

(ii) Hazardous waste transferred by a means other than pumping shall be performed such that during transfer of the waste into the container, the cover remains in place and all container openings are maintained in a closed, sealed position except for those openings through which the hazardous waste is added and as provided for in paragraph (d) of this section.

(c) Each container opening shall be maintained in a closed, sealed position (e.g., covered by a gasketed lid) at all times that hazardous waste is in the container except when it is necessary to use the opening to:

(1) Add, remove, inspect, or sample the material in the container;

(2) Inspect, maintain, repair, or replace equipment located inside the container; or

(3) Vent gases or vapors from a cover located over or enclosing an open container to a closed-vent system connected to a control device that is de-

signed and operated in accordance with the requirements of § 264.1087 of this subpart.

(d) One or more safety devices that vent directly to the atmosphere may be used on the container, cover, enclosure, closed-vent system, or control device provided each device meets all of the following conditions:

(1) The safety device is not used for planned or routine venting of organic vapors from the container, cover, enclosure, or closed-vent system connected to a control device; and

(2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the container, cover, enclosure, closed-vent system, or control device in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an unplanned event is a sudden power outage.

§ 264.1087 Standards: Closed-vent systems and control devices.

(a) This section applies to each closed-vent system and control device installed and operated by the owner or operator to control air emissions in accordance with standards of this subpart.

(b) The closed-vent system shall meet the following requirements:

(1) The closed-vent system shall route the gases, vapors, and fumes emitted from the hazardous waste in the waste management unit to a control device that meets the requirements specified in paragraph (c) of this section.

(2) The closed-vent system shall be designed and operated in accordance with the requirements specified in § 264.1033(k) of this part.

(3) If the closed-vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device, the owner or operator shall meet the following requirements:

(i) For each bypass device except as provided for in paragraph (b)(3)(ii) of

this section, the owner or operator shall either:

(A) Install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that indicates at least once every 15 minutes whether gas, vapor, or fume flow is present in the bypass device; or

(B) Secure a valve installed at the inlet to the bypass device in the closed position using a car-seal or a lock-and-key type configuration. The owner or operator shall visually inspect the seal or closure mechanism at least once every month to verify that the valve is maintained in the closed position.

(ii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements of paragraph (b)(3)(i) of this section.

(c) The control device shall meet the following requirements:

(i) The control device shall be one of the following devices:

(I) A control device designed and operated to reduce the total organic content of the inlet vapor stream vented to the control device by at least 95 percent by weight;

(ii) An enclosed combustion device designed and operated in accordance with the requirements of § 264.1033(c) of this part; or

(iii) A flare designed and operated in accordance with the requirements of § 264.1033(d) of this part.

(2) The control device shall be operating at all times when gases, vapors, or fumes are vented from the waste management unit through the closed-vent system to the control device.

(3) The owner or operator using a carbon adsorption system to comply with paragraph (c)(i) of this section shall operate and maintain the control device in accordance with the following requirements:

(i) Following the initial startup of the control device, all activated carbon in the control device shall be replaced with fresh carbon on a regular basis in accordance with the requirements of § 264.1033(g) or § 264.1033(h) of this part.

(ii) All carbon removed from the control device shall be managed in accordance with the requirements of § 264.1033(m) of this part.

(4) An owner or operator using a control device other than a thermal vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with paragraph (c)(1) of this section shall operate and maintain the control device in accordance with the requirements of § 264.1033(j) of this part.

(5) The owner or operator shall demonstrate that a control device achieves the performance requirements of paragraph (c)(1) of this section as follows:

(i) An owner or operator shall demonstrate using either a performance test as specified in paragraph (c)(5)(iii) of this section or a design analysis as specified in paragraph (c)(5)(iv) of this section the performance of each control device except for the following:

(A) A flare;

(B) A boiler or process heater with a design heat input capacity of 44 megawatts or greater;

(C) A boiler or process heater into which the vent stream is introduced with the primary fuel;

(D) A boiler or process heater burning hazardous waste for which the owner or operator has been issued a final permit under 40 CFR part 270 and designs and operates the unit in accordance with the requirements of 40 CFR part 268, subpart H; or

(E) A boiler or process heater burning hazardous waste for which the owner or operator has certified compliance with the interim status requirements of 40 CFR part 268, subpart H.

(ii) An owner or operator shall demonstrate the performance of each flare in accordance with the requirements specified in § 264.1033(e).

(iii) For a performance test conducted to meet the requirements of paragraph (c)(5)(i) of this section, the owner or operator shall use the test methods and procedures specified in § 264.1034(c)(1) through (c)(4).

(iv) For a design analysis conducted to meet the requirements of paragraph (c)(5)(i) of this section, the design analysis shall meet the requirements specified in § 264.1035(b)(4)(iii).

(v) The owner or operator shall demonstrate that a carbon adsorption system achieves the performance requirements of paragraph (c)(1) of this section based on the total quantity of

organics vented to the atmosphere from all carbon adsorption system equipment that is used for organic adsorption, organic desorption or carbon regeneration, organic recovery, and carbon disposal.

(6) If the owner or operator and the Regional Administrator do not agree on a demonstration of control device performance using a design analysis then the disagreement shall be resolved using the results of a performance test performed by the owner or operator in accordance with the requirements of paragraph (c)(5)(iii) of this section. The Regional Administrator may choose to have an authorized representative observe the performance test.

§ 264.1088 Inspection and monitoring requirements.

(a) This section applies to an owner or operator using air emission controls in accordance with the requirements of § 264.1084 through § 264.1087 of this subpart.

(b) Each cover used in accordance with requirements of § 264.1084 through § 264.1086 of this subpart shall be visually inspected and monitored by the owner or operator using the procedure specified in 40 CFR 265.1089(f)(1) through (f)(7) except as follows:

(1) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in 40 CFR 265.1089(f)(1) through (f)(7) for the following tank covers:

(i) A tank internal floating roof that is inspected and monitored in accordance with the requirements of § 264.1091 of this subpart; or

(ii) A tank external floating roof that is inspected and monitored in accordance with the requirements of § 264.1091 of this subpart.

(2) If a tank is buried partially or entirely underground, an owner or operator is required to perform the cover inspection and monitoring requirements specified in 40 CFR 265.1089(f)(1) through (f)(7) only for those portions of the tank cover and those connections to the tank cover or tank body (e.g. fill ports, access hatches, gauge wells, etc.) that extend to or above the ground surface and can be opened to the atmosphere.

(3) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in 40 CFR 265.1089(f)(1) through (f)(7) for a container that meets all requirements specified in either § 264.1086(b)(1)(i) or § 264.1086(b)(1)(ii) of this subpart.

(4) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in 40 CFR 265.1089(f)(1) through (f)(7) for an enclosure used to control air emissions from containers in accordance with the requirements of § 264.1086(b)(2) of this subpart.

(c) Each closed-vent system used in accordance with the requirements of § 264.1087 shall be inspected and monitored by the owner or operator in accordance with the procedure specified in § 264.1033(k).

(d) Each control device used in accordance with the requirements of § 264.1087 of this subpart shall be inspected and monitored by the owner or operator in accordance with the procedures specified in § 264.1033(f) and § 264.1033(i).

(e) The owner or operator shall develop and implement a written plan and schedule to perform all inspection and monitoring requirements of this section. The owner or operator shall incorporate this plan and schedule into the facility inspection plan required under § 264.15.

§ 264.1089 Recordkeeping requirements.

(a) Each owner or operator of a facility subject to requirements in this subpart shall record and maintain the following information as applicable:

(1) Documentation for each cover installed on a tank in accordance with the requirements of § 264.1084(b)(2) or § 264.1084(b)(3) of this subpart that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the applicable design specifications as listed in 40 CFR 265.1091(c).

(2) Documentation for each floating membrane cover installed on a surface impoundment in accordance with the requirements of § 264.1086(c) of this sub-

part that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the specifications listed in 40 CFR 265.1086(e).

(3) Documentation for each enclosure used to control air emissions from containers in accordance with the requirements of § 264.1086(b)(2)(i) of this subpart that includes information prepared by the owner or operator or provided by the manufacturer or vendor describing the enclosure design, and certification by the owner or operator that the enclosure meets the specifications listed in § 264.1086(b)(2)(ii) of this subpart.

(4) Documentation for each closed-vent system and control device installed in accordance with the requirements of § 264.1087 of this subpart that includes:

(i) Certification that is signed and dated by the owner or operator stating that the control device is designed to operate at the performance level documented by a design analysis as specified in paragraph (a)(4)(ii) of this section or by performance tests as specified in paragraph (a)(4)(iii) of this section when the tank, surface impoundment, or container is or would be operating at capacity or the highest level reasonably expected to occur.

(ii) If a design analysis is used, then design documentation as specified in § 264.1035(b)(4). The documentation shall include information prepared by the owner or operator or provided by the control device manufacturer or vendor that describes the control device design in accordance with § 264.1035(b)(4)(iii) and certification by the owner or operator that the control equipment meets the applicable specifications.

(iii) If performance tests are used, then a performance test plan as specified in § 264.1035(b)(3) and all test results.

(iv) Information as required by § 264.1035(c)(1) and (c)(2).

(5) Records for all Method 27 tests performed by the owner or operator for each container used to meet the requirements of § 264.1086(b)(1)(iii) of this subpart.

(6) Records for all visual inspections conducted in accordance with the requirements of § 264.1088 of this subpart.

(7) Records for all monitoring for detectable organic emissions conducted in accordance with the requirements of § 264.1088 of this subpart.

(8) Records of the date of each attempt to repair a leak, repair methods applied, and the date of successful repair.

(9) Records for all continuous monitoring conducted in accordance with the requirements of § 264.1088 of this subpart.

(10) Records of the management of carbon removed from a carbon adsorption system conducted in accordance with § 264.1087(c)(3)(i) of this subpart.

(11) Records for all inspections of each cover installed on a tank in accordance with the requirements of § 264.1084(b)(2) or § 264.1084(b)(3) of this subpart that includes information as listed in 40 CFR 265.1091(c).

(b) An owner or operator electing to use air emission controls for a tank in accordance with the conditions specified in § 264.1084(c) of this subpart shall record the following information:

(1) Date and time each waste sample is collected for direct measurement of maximum organic vapor pressure in accordance with § 264.1083(c) of this subpart.

(2) Results of each determination of the maximum organic vapor pressure of the waste in a tank performed in accordance with § 264.1083(c) of this subpart.

(3) Records specifying the tank dimensions and design capacity.

(c) An owner or operator electing to use air emission controls for a tank in accordance with the requirements of § 264.1091 of this subpart shall record the information required by § 264.1091(c) of this subpart.

(d) An owner or operator electing not to use air emission controls for a particular tank, surface impoundment, or container subject to this subpart in accordance with the conditions specified in § 264.1082(c) of this subpart shall record the information used by the owner or operator for each waste determination (e.g., test results, measurements, calculations, and other documentation) in the facility operating

log. If analysis results for waste samples are used for the waste determination, then the owner or operator shall record the date, time, and location that each waste sample is collected in accordance with applicable requirements of § 264.1083 of this subpart.

(e) An owner or operator electing to comply with requirements in accordance with § 264.1082(c)(2)(v) or § 264.1082(c)(2)(vi) of this subpart shall record the identification number for the incinerator, boiler, or industrial furnace in which the hazardous waste is treated.

(f) An owner or operator designating a cover as unsafe to inspect and monitor pursuant to 40 CFR 265.1089(f)(5) or difficult to inspect and monitor pursuant to 40 CFR 265.1089(f)(6) shall record in a log that is kept in the facility operating record the following information:

(1) A list of identification numbers for tanks with covers that are designated as unsafe to inspect and monitor in accordance with the requirements of 40 CFR 265.1089(f)(5), an explanation for each cover stating why the cover is unsafe to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

(2) A list of identification numbers for tanks with covers that are designated as difficult to inspect and monitor in accordance with the requirements of 40 CFR 265.1089(f)(6), an explanation for each cover stating why the cover is difficult to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

(g) All records required by paragraphs (a) through (f) of this section except as required in paragraphs (a)(1) through (a)(4) of this section shall be maintained in the operating record for a minimum of 3 years. All records required by paragraphs (a)(1) through (a)(4) of this section shall be maintained in the operating record until the air emission control equipment is replaced or otherwise no longer in service.

(h) The owner or operator of a facility that is subject to this subpart and to the control device standards in 40 CFR part 60, subpart VV or 40 CFR part 61, subpart V may elect to demonstrate compliance with the applicable sec-

tions of this subpart by documentation either pursuant to this subpart, or pursuant to the provisions of 40 CFR part 60, subpart VV or 40 CFR part 61, subpart V, to the extent that the documentation required by 40 CFR parts 60 or 61 duplicates the documentation required by this section.

§ 264.1090 Reporting requirements.

(a) Each owner or operator managing hazardous waste in a tank, surface impoundment, or container exempted from using air emission controls under the provisions of § 264.1082(c) shall report to the Regional Administrator each occurrence when hazardous waste is placed in the waste management unit in noncompliance with the conditions specified in § 264.1082(c)(1) or (c)(2) of this subpart, as applicable. Examples of such occurrences include placing in the waste management unit a hazardous waste having an average VO concentration equal to or greater than 100 ppmw at the point of waste origination; or placing in the waste management unit a treated hazardous waste which fails to meet the applicable conditions specified in § 264.1082(c)(2)(i) through (c)(2)(v) of this subpart. The owner or operator shall submit a written report within 15 calendar days of the time that the owner or operator becomes aware of the occurrence. The written report shall contain the EPA identification number, facility name and address, a description of the noncompliance event and the cause, the dates of the noncompliance, and the actions taken to correct the noncompliance and prevent recurrence of the noncompliance. The report shall be signed and dated by an authorized representative of the owner or operator.

(b) Each owner or operator using air emission controls on a tank in accordance with the requirements § 264.1084(c) of this subpart shall report to the Regional Administrator each occurrence when hazardous waste is managed in the tank in noncompliance with the conditions specified in § 264.1084(c)(1) through (c)(4) of this subpart. The owner or operator shall submit a written report within 15 calendar days of the time that the owner or operator becomes aware of the occurrence. The written report shall contain the EPA

identification number, facility name and address, a description of the non-compliance event and the cause, the dates of the noncompliance, and the actions taken to correct the noncompliance and prevent recurrence of the noncompliance. The report shall be signed and dated by an authorized representative of the owner or operator.

(c) Each owner or operator using a control device in accordance with the requirements of § 264.1087 of this subpart shall submit a semiannual written report to the Regional Administrator excepted as provided for in paragraph (d) of this section. The report shall describe each occurrence during the previous 6-month period when a control device is operated continuously for 24 hours or longer in noncompliance with the applicable operating values defined in § 264.1035(c)(4) or when a flare is operated with visible emissions as defined in § 264.1033(d). The written report shall include the EPA identification number, facility name and address, and an explanation why the control device could not be returned to compliance within 24 hours, and actions taken to correct the noncompliance. The report shall be signed and dated by an authorized representative of the owner or operator.

(d) A report to the Regional Administrator in accordance with the requirements of paragraph (c) of this section is not required for a 6-month period during which all control devices subject to this subpart are operated by the owner or operator such that during no period of 24 hours or longer did a control device operate continuously in noncompliance with the applicable operating values defined in § 264.1035(c)(4) or a flare operate with visible emissions as defined in § 264.1033(d).

§ 264.1091 Alternative control requirements for tanks.

(a) This section applies to owners and operators of tanks electing to comply with § 264.1084(b)(2) or § 264.1084(b)(3) of this subpart.

(1) The owner or operator electing to comply with § 264.1084(b)(2) of this subpart shall design, install, operate, and maintain a fixed roof and internal floating roof that meet the requirements specified in 40 CFR 265.1091(a)(1) through (a)(1)(ix).

(2) The owner or operator electing to comply with § 264.1084(b)(3) of this subpart shall design, install, operate, and maintain an external floating roof that meets the requirements specified in 40 CFR 265.1091(a)(2)(i) through (a)(2)(iii).

(b) The owner or operator shall inspect and monitor the control equipment in accordance with the following requirements:

(1) For a tank equipped with a fixed roof and internal floating roof in accordance with the requirements of paragraph (a)(1) of this section, the owner or operator shall perform the inspection and monitoring requirements specified in 40 CFR 265.1091(b)(1).

(2) For a tank equipped with an external floating roof in accordance with the requirements of paragraph (a)(2) of this section, the owner or operator shall perform the inspection and monitoring requirements specified in 40 CFR 265.1091(b)(2).

(c) The owner or operator shall record the following information in the operating record in accordance with the requirements of § 264.1089(a)(1) and (a)(11) of this subpart:

(1) For a tank equipped with a fixed roof and internal floating roof in accordance with the requirements of paragraph (a)(1) of this section, the owner or operator shall record the information listed in 40 CFR 265.1091(c)(1).

(2) For a tank equipped with an external floating roof in accordance with the requirements of paragraph (a)(2) of this section, the owner or operator shall record the information listed in 40 CFR 265.1091(c)(2).

Subpart DD—Containment Buildings

SOURCE: 57 FR 37265, Aug. 18, 1992, unless otherwise noted.

§ 264.1100 Applicability.

The requirements of this subpart apply to owners or operators who store or treat hazardous waste in units designed and operated under § 264.1101 of this subpart. These provisions will become effective on February 18, 1993, although owner or operator may notify the Regional Administrator of his intent to be bound by this subpart at an

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earlier time. The owner or operator is not subject to the definition of land disposal in RCRA section 3004(k) provided that the unit:

(a) Is a completely enclosed, self-supporting structure that is designed and constructed of manmade materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed; climatic conditions; and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls;

(b) Has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel, wastes, and handling equipment within the unit;

(c) If the unit is used to manage liquids, has:

(1) A primary barrier designed and constructed of materials to prevent migration of hazardous constituents into the barrier;

(2) A liquid collection system designed and constructed of materials to minimize the accumulation of liquid on the primary barrier; and

(3) A secondary containment system designed and constructed of materials to prevent migration of hazardous constituents into the barrier, with a leak detection and liquid collection system capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest practicable time, unless the unit has been granted a variance from the secondary containment system requirements under § 264.1101(b)(4);

(d) Has controls sufficient to prevent fugitive dust emissions to meet the no visible emission standard in § 264.1101(c)(1)(iv); and

(e) Is designed and operated to ensure containment and prevent the tracking of materials from the unit by personnel or equipment.

§ 264.1101 Design and operating standards.

(a) All containment buildings must comply with the following design standards:

(1) The containment building must be completely enclosed with a floor, walls, and a roof to prevent exposure to the elements, (e.g., precipitation, wind, run-on), and to assure containment of managed wastes.

(2) The floor and containment walls of the unit, including the secondary containment system if required under paragraph (b) of this section, must be designed and constructed of materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the unit, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed; climatic conditions; and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls. The unit must be designed so that it has sufficient structural strength to prevent collapse or other failure. All surfaces to be in contact with hazardous wastes must be chemically compatible with those wastes. EPA will consider standards established by professional organizations generally recognized by the industry such as the American Concrete Institute (ACI) and the American Society of Testing Materials (ASTM) in judging the structural integrity requirements of this paragraph. If appropriate to the nature of the waste management operation to take place in the unit, an exception to the structural strength requirement may be made for light-weight doors and windows that meet these criteria:

(i) They provide an effective barrier against fugitive dust emissions under paragraph (c)(1)(iv); and

(ii) The unit is designed and operated in a fashion that assures that wastes will not actually come in contact with these openings.

(3) Incompatible hazardous wastes or treatment reagents must not be placed

ardous materials regulations (49 CFR parts 173, 178 and 179), if those regulations specify a particular inside container for the waste.

(b) The inside containers must be overpacked in an open head DOT-specification metal shipping container (49 CFR parts 178 and 179) of no more than 416-liter (110 gallon) capacity and surrounded by, at a minimum, a sufficient quantity of sorbent material, determined to be nonbiodegradable in accordance with § 265.314(f), to completely absorb all of the liquid contents of the inside containers. The metal outer container must be full after it has been packed with inside containers and sorbent material.

(c) The sorbent material used must not be capable of reacting dangerously with, being decomposed by, or being ignited by the contents of the inside container's in accordance with § 265.17(b).

(d) Incompatible wastes, as defined in § 260.10(a) of this chapter, must not be placed in the same outside container.

(e) Reactive waste, other than cyanide- or sulfide-bearing waste as defined in § 261.23(a)(6) of this chapter, must be treated or rendered non-reactive prior to packaging in accordance with paragraphs (a) through (d) of this section. Cyanide- and sulfide-bearing reactive waste may be packaged in accordance with paragraphs (a) through (d) of this section without first being treated or rendered non-reactive.

(f) Such disposal is in compliance with the requirements of 40 CFR part 268. Persons who incinerate lab packs according to the requirements in 40 CFR 268.42(c)(1) may use fiber drums in place of metal outer containers. Such fiber drums must meet the DOT specifications in 49 CFR 173.12 and be overpacked according to the requirements in paragraph (b) of this section.

(46 FR 56596, Nov. 17, 1981, as amended at 55 FR 22696, June 1, 1990; 57 FR 54461, Nov. 19, 1992)

Subpart O—Incinerators

Source: 46 FR 7680, Jan. 23, 1981, unless otherwise noted.

§ 265.340 Applicability.

(a) The regulations of this subpart apply to owners and operators of haz-

ardous waste incinerators (as defined in § 260.10 of this chapter), except as § 265.1 provides otherwise.

(b) Owners and operators of incinerators burning hazardous waste are exempt from all of the requirements of this subpart, except § 265.351 (Closure), provided that the owner or operator has documented, in writing, that the waste would not reasonably be expected to contain any of the hazardous constituents listed in part 261, appendix VIII, of this chapter, and such documentation is retained at the facility, if the waste to be burned is:

(1) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is ignitable (Hazard Code I), corrosive (Hazard Code C), or both; or

(2) Listed as a hazardous waste in part 261, subpart D, of this chapter solely because it is reactive (Hazard Code R) for characteristics other than those listed in § 261.23(a) (4) and (5), and will not be burned when other hazardous wastes are present in the combustion zone; or

(3) A hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the tests for characteristics of hazardous wastes under part 261, subpart C, of this chapter; or

(4) A hazardous waste solely because it possesses the reactivity characteristics described by § 261.23(a) (1), (2), (3), (6), (7), or (8) of this chapter, and will not be burned when other hazardous wastes are present in the combustion zone.

(47 FR 27533, June 24, 1982 and 50 FR 666, Jan. 4, 1985, as amended at 50 FR 49203, Nov. 29, 1985; 56 FR 7208, Feb. 21, 1991)

§ 265.341 Waste analysis.

In addition to the waste analyses required by § 265.13, the owner or operator must sufficiently analyze any waste which he has not previously burned in his incinerator to enable him to establish steady state (normal) operating conditions (including waste and auxiliary fuel feed and air flow) and to determine the type of pollutants which might be emitted. At a minimum, the analysis must determine:

(a) Heating value of the waste;

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(b) Halogen content and sulfur content in the waste; and

(c) Concentrations in the waste of lead and mercury, unless the owner or operator has written, documented data that show that the element is not present.

(Comment: As required by § 265.73, the owner or operator must place the results from each waste analysis, or the documented information, in the operating record of the facility.)

§ 265.342—265.344 [Reserved]

§ 265.345 General operating requirements.

During start-up and shut-down of an incinerator, the owner or operator must not feed hazardous waste unless the incinerator is at steady state (normal) conditions of operation, including steady state operating temperature and air flow.

§ 265.346 [Reserved]

§ 265.347 Monitoring and inspections.

The owner or operator must conduct, as a minimum, the following monitoring and inspections when incinerating hazardous waste:

(a) Existing instruments which relate to combustion and emission control must be monitored at least every 15 minutes. Appropriate corrections to maintain steady state combustion conditions must be made immediately either automatically or by the operator. Instruments which relate to combustion and emission control would normally include those measuring waste feed, auxiliary fuel feed, air flow, incinerator temperature, scrubber flow, scrubber pH, and relevant level controls.

(b) The complete incinerator and associated equipment (pumps, valves, conveyors, pipes, etc.) must be inspected at least daily for leaks, spills, and fugitive emissions, and all emergency shutdown controls and system alarms must be checked to assure proper operation.

(46 FR 7676, Jan. 23, 1981, as amended at 47 FR 27533, June 24, 1982)

§ 265.348—265.350 [Reserved]

§ 265.351 Closure.

At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including but not limited to ash, scrubber waters, and scrubber sludges) from the incinerator.

(Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with § 261.3(d) of this chapter, that the residue removed from his incinerator is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262 through 266 of this chapter.)

§ 265.352 Interim status incinerators burning particular hazardous wastes.

(a) Owners or operators of incinerators subject to this subpart may burn EPA Hazardous Wastes FO20, FO21, FO22, FO23, FO26, or FO27 if they receive a certification from the Assistant Administrator for Solid Waste and Emergency Response that they can meet the performance standards of subpart O of part 264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify an incinerator:

(1) The owner or operator will submit an application to the Assistant Administrator for Solid Waste and Emergency Response containing applicable information in §§ 270.19 and 270.62 demonstrating that the incinerator can meet the performance standards in subpart O of part 264 when they burn these wastes.

(2) The Assistant Administrator for Solid Waste and Emergency Response will issue a tentative decision as to whether the incinerator can meet the performance standards in subpart O of part 264. Notification of this tentative decision will be provided by newspaper advertisement and radio broadcast in the jurisdiction where the incinerator is located. The Assistant Administrator for Solid Waste and Emergency Response will accept comment on the tentative decision for 60 days. The As-

Assistant Administrator for Solid Waste and Emergency Response also may hold a public hearing upon request or at his discretion.

(3) After the close of the public comment period, the Assistant Administrator for Solid Waste and Emergency Response will issue a decision whether or not to certify the incinerator.

[50 FR 2005, Jan. 14, 1985]

§ 265.353-265.369 [Reserved]

Subpart P—Thermal Treatment

§ 265.370 Other thermal treatment.

The regulations in this subpart apply to owners or operators of facilities that thermally treat hazardous waste in devices other than enclosed devices using controlled flame combustion, except as § 265.1 provides otherwise. Thermal treatment in enclosed devices using controlled flame combustion is subject to the requirements of subpart O if the unit is an incinerator, and subpart H of part 266, if the unit is a boiler or an industrial furnace as defined in § 260.10.

[50 FR 668, Jan. 4, 1985, as amended at 56 FR 32692, July 17, 1991]

§ 265.371-265.372 [Reserved]

§ 265.373 General operating requirements.

Before adding hazardous waste, the owner or operator must bring his thermal treatment process to steady state (normal) conditions of operating temperature—using auxiliary fuel or other means, unless the process is a non-continuous (batch) thermal treatment process which requires a complete thermal cycle to treat a discrete quantity of hazardous waste.

§ 265.374 [Reserved]

§ 265.375 Waste analysis.

In addition to the waste analyses required by § 265.13, the owner or operator must sufficiently analyze any waste which he has not previously treated in his thermal process to enable him to establish steady state (normal) or other appropriate (for a non-contin-

uous process) operating conditions (including waste and auxiliary fuel feed) and to determine the type of pollutants which might be emitted. At a minimum, the analysis must determine:

(a) Heating value of the waste;

(b) Halogen content and sulfur content in the waste; and

(c) Concentrations in the waste of lead and mercury, unless the owner or operator has written, documented data that show that the element is not present.

[Comment: As required by § 265.73, the owner or operator must place the results from each waste analysis, or the documented information, in the operating record of the facility.]

§ 265.376 [Reserved]

§ 265.377 Monitoring and inspections.

(a) The owner or operator must conduct, as a minimum, the following monitoring and inspections when thermally treating hazardous waste:

(1) Existing instruments which relate to temperature and emission control (if an emission control device is present) must be monitored at least every 15 minutes. Appropriate corrections to maintain steady state or other appropriate thermal treatment conditions must be made immediately either automatically or by the operator. Instruments which relate to temperature and emission control would normally include those measuring waste feed, auxiliary fuel feed, treatment process temperature, and relevant process flow and level controls.

(2) The stack plume (emissions), where present, must be observed visually at least hourly for normal appearance (color and opacity). The operator must immediately make any indicated operating corrections necessary to return any visible emissions to their normal appearance.

(3) The complete thermal treatment process and associated equipment (pumps, valves, conveyors, pipes, etc.) must be inspected at least daily for leaks, spills, and fugitive emissions, and all emergency shutdown controls and system alarms must be checked to assure proper operation.

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§ 265.378-265.380 [Reserved]

§ 265.381 Closure.

At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash) from the thermal treatment process or equipment.

[Comment: At closure, as throughout the operating period, unless the owner or operator can demonstrate, in accordance with § 261.3 (c) or (d) of this chapter, that any solid waste removed from his thermal treatment process or equipment is not a hazardous waste, the owner or operator becomes a generator of hazardous waste and must manage it in accordance with all applicable requirements of parts 262, 263, and 265 of this chapter.]

§ 265.382 Open burning; waste explosives.

Open burning of hazardous waste is prohibited except for the open burning and detonation of waste explosives. Waste explosives include waste which has the potential to detonate and bulk military propellants which cannot safely be disposed of through other modes of treatment. Detonation is an explosion in which chemical transformation passes through the material faster than the speed of sound (0.33 kilometers/second at sea level). Owners or operators choosing to open burn or detonate waste explosives must do so in accordance with the following table and in a manner that does not threaten human health or the environment.

Pounds of waste explosives or propellants	Minimum distance from open burning or detonation to the property of others
0 to 100	204 meters (670 feet).
101 to 1,000	380 meters (1,250 feet).
1,001 to 10,000	530 meters (1,730 feet).
10,001 to 30,000	660 meters (2,160 feet).

§ 265.383 Interim status thermal treatment devices burning particular hazardous waste.

(a) Owners or operators of thermal treatment devices subject to this subpart may burn EPA Hazardous Wastes FO20, FO21, FO22, FO23, FO26, or FO27 if they receive a certification from the Assistant Administrator for Solid Waste and Emergency Response that they can meet the performance stand-

ards of subpart O of part 264 when they burn these wastes.

(b) The following standards and procedures will be used in determining whether to certify a thermal treatment unit:

(1) The owner or operator will submit an application to the Assistant Administrator for Solid Waste and Emergency Response containing the applicable information in §§ 270.19 and 270.62 demonstrating that the thermal treatment unit can meet the performance standard in subpart O of part 264 when they burn these wastes.

(2) The Assistant Administrator for Solid Waste and Emergency Response will issue a tentative decision as to whether the thermal treatment unit can meet the performance standards in subpart O of part 264. Notification of this tentative decision will be provided by newspaper advertisement and radio broadcast in the jurisdiction where the thermal treatment device is located. The Assistant Administrator for Solid Waste and Emergency Response will accept comment on the tentative decision for 60 days. The Assistant Administrator for Solid Waste and Emergency Response also may hold a public hearing upon request or at his discretion.

(3) After the close of the public comment period, the Assistant Administrator for Solid Waste and Emergency Response will issue a decision whether or not to certify the thermal treatment unit.

[50 FR 2005, Jan. 14, 1985]

Subpart Q—Chemical, Physical, and Biological Treatment

§ 265.400 Applicability.

The regulations in this subpart apply to owners and operators of facilities which treat hazardous wastes by chemical, physical, or biological methods in other than tanks, surface impoundments, and land treatment facilities, except as § 265.1 provides otherwise. Chemical, physical, and biological treatment of hazardous waste in tanks, surface impoundments, and land treatment facilities must be conducted in accordance with subparts J, K, and M, respectively.

subpart, the owner or operator must design, construct, operate and maintain a run-off management system to collect and control at least the water volume resulting from a 24-hour, 25-year storm.

(g) The drip pad must be evaluated to determine that it meets the requirements of paragraphs (a) through (f) of this section and the owner or operator must obtain a statement from an independent, qualified registered professional engineer certifying that the drip pad design meets the requirements of this section.

(h) Dripage and accumulated precipitation must be removed from the associated collection system as necessary to prevent overflow onto the drip pad.

(i) The drip pad surface must be cleaned thoroughly in a manner and frequency such that accumulated residues of hazardous waste or other materials are removed, with residues being properly managed as hazardous waste, so as to allow weekly inspections of the entire drip pad surface without interference or hindrance from accumulated residues of hazardous waste or other materials on the drip pad. The owner or operator must document the date and time of each cleaning and the cleaning procedure used in the facility's operating log.

(j) Drip pads must be operated and maintained in a manner to minimize tracking of hazardous waste or hazardous waste constituents off the drip pad as a result of activities by personnel or equipment.

(k) After being removed from the treatment vessel, treated wood from pressure and non-pressure processes must be held on the drip pad until dripage has ceased. The owner or operator must maintain records sufficient to document that all treated wood is held on the pad following treatment in accordance with this requirement.

(l) Collection and holding units associated with run-on and run-off control systems must be emptied or otherwise managed as soon as possible after storms to maintain design capacity of the system.

(m) Throughout the active life of the drip pad, if the owner or operator de-

fects a condition that may have caused or has caused a release of hazardous waste, the condition must be repaired within a reasonably prompt period of time following discovery. In accordance with the following procedures:

(1) Upon detection of a condition that may have caused or has caused a release of hazardous waste (e.g., upon detection of leakage by the leak detection system), the owner or operator must:

(i) Enter a record of the discovery in the facility operating log;

(ii) Immediately remove the portion of the drip pad affected by the condition from service;

(iii) Determine what steps must be taken to repair the drip pad, remove any leakage from below the drip pad, and establish a schedule for accomplishing the clean up and repairs;

(iv) Within 24 hours after discovery of the condition, notify the Regional Administrator of the condition and, within 10 working days, provide a written notice to the Regional Administrator with a description of the steps that will be taken to repair the drip pad, and clean up any leakage, and the schedule for accomplishing this work.

(2) The Regional Administrator will review the information submitted, make a determination regarding whether the pad must be removed from service completely or partially until repairs and clean up are complete, and notify the owner or operator of the determination and the underlying rationale in writing.

(3) Upon completing all repairs and clean up, the owner or operator must notify the Regional Administrator in writing and provide a certification, signed by an independent qualified, registered professional engineer, that the repairs and clean up have been completed according to the written plan submitted in accordance with paragraph (m)(1)(iv) of this section.

(n) The owner or operator must maintain, as part of the facility operating log, documentation of past operating and waste handling practices. This must include identification of preservative formulations used in the past, a description of drippage management

practices, and a description of treated wood storage and handling practices.

55 FR 50486, Dec. 6, 1990, as amended at 56 FR 30198, July 1, 1991; 57 FR 5861, Feb. 18, 1992; 57 FR 61504, Dec. 24, 1992]

§ 265.444 Inspections.

(a) During construction or installation, liners and cover systems (e.g., membranes, sheets, or coatings) must be inspected for uniformity, damage, and imperfections (e.g., holes, cracks, thin spots, or foreign materials). Immediately after construction or installation, liners must be inspected and certified as meeting the requirements of § 265.443 of this subpart by an independent qualified, registered professional engineer. The certification must be maintained at the facility as part of the facility operating record. After installation liners and covers must be inspected to ensure tight seams and joints and the absence of tears, punctures, or blisters.

(b) While a drip pad is in operation, it must be inspected weekly and after storms to detect evidence of any of the following:

(1) Deterioration, malfunctions or improper operation of run-on and run-off control systems;

(2) The presence of leakage in and proper functioning of leakage detection system.

(3) Deterioration or cracking of the drip pad surface.

NOTE: See § 265.443(m) for remedial action required if deterioration or leakage is detected.

§ 265.445 Closure.

(a) At closure, the owner or operator must remove or decontaminate all waste residues, contaminated containment system components (pad, liners, etc.), contaminated subsoils, and structures and equipment contaminated with waste and leakage, and manage them as hazardous waste.

(b) If, after removing or decontaminating all residues and making all reasonable efforts to effect removal or decontamination of contaminated components, subsoils, structures, and equipment as required in paragraph (a) of this section, the owner or operator finds that not all contaminated sub-

soils can be practically removed or decontaminated, he must close the facility and perform post-closure care in accordance with closure and post-closure care requirements that apply to landfills (§ 265.310). For permitted units, the requirement to have a permit continues throughout the post-closure period.

(c)(1) The owner or operator of an existing drip pad, as defined in § 265.440 of this subpart, that does not comply with the liner requirements of § 265.443(b)(1) must:

(i) Include in the closure plan for the drip pad under § 265.112 both a plan for complying with paragraph (a) of this section and a contingent plan for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure; and

(ii) Prepare a contingent post-closure plan under § 265.118 of this part for complying with paragraph (b) of this section in case not all contaminated subsoils can be practicably removed at closure.

(2) The cost estimates calculated under §§ 265.112 and 265.144 of this part for closure and post-closure care of a drip pad subject to this paragraph must include the cost of complying with the contingent closure plan and the contingent post-closure plan, but are not required to include the cost of expected closure under paragraph (a) of this section.

Subparts X-Z (Reserved)

Subpart AA—Air Emission Standards for Process Vents

SOURCE: 55 FR 25507, June 21, 1990, unless otherwise noted.

§ 265.1030 Applicability.

(a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 265.1).

(b) Except for §§ 265.1034(d) and (e), this subpart applies to process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations that manage hazardous wastes

with organic concentrations of at least 10 ppmw, if these operations are conducted in:

- (1) Units that are subject to the permitting requirements of part 270, or
- (2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.

[Note: The requirements of § 265.1032 through 265.1036 apply to process vents on hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under §§ 261.4, 263.34, and 265.1(c) are not affected by these requirements.]

[55 FR 25507, June 21, 1990, as amended at 56 FR 12290, Apr. 26, 1991]

§ 265.1031 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260-266.

§ 265.1032 Standards: Process vents.

(a) The owner or operator of a facility with process vents associated with distillation, fractionation, thin-film evaporation, solvent extraction or air or steam stripping operations managing hazardous wastes with organic concentrations at least 10 ppmw shall either:

- (1) Reduce total organic emissions from all affected process vents at the facility below 1.4 kg/h (3 lb/h) and 2.8 Mg/yr (3.1 tons/yr), or
- (2) Reduce, by use of a control device, total organic emissions from all affected process vents at the facility by 95 weight percent.

(b) If the owner or operator installs a closed-vent system and control device to comply with the provisions of paragraph (a) of this section, the closed-vent system and control device must meet the requirements of § 265.1033.

(c) Determinations of vent emissions and emission reductions or total organic compound concentrations achieved by add-on control devices may be based on engineering calculations or performance tests. If performance tests are used to determine vent emissions, emission reductions, or total organic compound concentrations achieved by add-on control devices, the performance tests must conform with the requirements of § 265.1034(c).

- (d) When an owner or operator and the Regional Administrator do not agree on determinations of vent emissions and/or emission reductions or total organic compound concentrations achieved by add-on control devices based on engineering calculations, the test methods in § 265.1034(c) shall be used to resolve the disagreement.

§ 265.1033 Standards: Closed-vent systems and control devices.

(a)(1) Owners or operators of closed-vent systems and control devices used to comply with provisions of this part shall comply with the provisions of this section.

(2) The owner or operator of an existing facility who cannot install a closed-vent system and control device to comply with the provisions of this subpart on the effective date that the facility becomes subject to the provisions of this subpart must prepare an implementation schedule that includes dates by which the closed-vent system and control device will be installed and in operation. The controls must be installed as soon as possible, but the implementation schedule may allow up to 18 months after the effective date that the facility becomes subject to this subpart for installation and startup. All units that begin operation after December 21, 1990 must comply with the rules immediately (i.e., must have control devices installed and operating on startup of the affected unit); the 2-year implementation schedule does not apply to these units.

(b) A control device involving vapor recovery (e.g., a condenser or adsorber) shall be designed and operated to recover the organic vapors vented to it with an efficiency of 95 weight percent or greater unless the total organic emission limits of § 265.1032(a)(1) for all affected process vents can be attained at an efficiency less than 95 weight percent.

(c) An enclosed combustion device (e.g., a vapor incinerator, boiler, or process heater) shall be designed and operated to reduce the organic emissions vented to it by 95 weight percent or greater; to achieve a total organic compound concentration of 20 ppmv, expressed as the sum of the actual compounds, not carbon equivalents, on

a dry basis corrected to 3 percent oxygen; or to provide a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C. If a boiler or process heater is used as the control device, then the vent stream combustion introduced into the flame combustion zone of the boiler or process heater.

(d)(1) A flare shall be designed for and operated with no visible emissions as determined by the methods specified in paragraph (e)(1) of this section, except for periods not to exceed a total of 5 minutes during any 2 consecutive hours.

(2) A flare shall be operated with a flame present at all times, as determined by the methods specified in paragraph (f)(2)(iii) of this section.

(3) A flare shall be used only if the net heating value of the gas being combusted is 11.2 MJ/scm (300 Btu/scf) or greater, if the flare is steam-assisted or air-assisted; or if the net heating value of the gas being combusted is 7.45 MJ/scm (200 Btu/scf) or greater if the flare is nonassisted. The net heating value of the gas being combusted shall be determined by the methods specified in paragraph (e)(2) of this section.

(4)(i) A steam-assisted or nonassisted flare shall be designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, of less than 18.3 m/s (60 ft/s), except as provided in paragraphs (d)(4) (ii) and (iii) of this section.

(ii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, equal to or greater than 18.3 m/s (60 ft/s) but less than 122 m/s (400 ft/s) is allowed if the net heating value of the gas being combusted is greater than 37.3 MJ/scm (1,000 Btu/scf).

(iii) A steam-assisted or nonassisted flare designed for and operated with an exit velocity, as determined by the methods specified in paragraph (e)(3) of this section, less than the velocity, V_{max} , as determined by the method specified in paragraph (e)(4) of this section, and less than 122 m/s (400 ft/s) is allowed.

(5) An air-assisted flare shall be designed and operated with an exit velocity less than the velocity, V_{max} , as de-

termined by the method specified in paragraph (e)(5) of this section.

(6) A flare used to comply with this section shall be steam-assisted, air-assisted, or nonassisted.

(e)(1) Reference Method 22 in 40 CFR part 60 shall be used to determine the compliance of a flare with the visible emission provisions of this subpart. The observation period is 2 hours and shall be used according to Method 22.

(2) The net heating value of the gas being combusted in a flare shall be calculated using the following equation:

$$H_f = K \left[\sum C_i H_i \right]$$

where:

H_f = Net heating value of the sample, MJ/scm; where the net enthalpy per mole of offgas is based on combustion at 25 °C and 760 mm Hg, but the standard temperature for determining the volume corresponding to 1 mol is 20 °C;

K = Constant, 1.74×10^{-7} (1/ppm) (g mole/scm) (MJ/kcal) where standard temperature for (g mole/scm) is 20 °C;

C_i = Concentration of sample component i in ppm on a wet basis, as measured for organics by Reference Method 16 in 40 CFR part 60 and measured for hydrogen and carbon monoxide by ASTM D 1946-82 (incorporated by reference as specified in § 260.11); and

H_i = Net heat of combustion of sample component i , kcal/g mol at 25 °C and 760 mm Hg. The heats of combustion may be determined using ASTM D 2382-83 (incorporated by reference as specified in § 260.11) if published values are not available or cannot be calculated.

(3) The actual exit velocity of a flare shall be determined by dividing the volumetric flow rate (in units of standard temperature and pressure), as determined by Reference Methods 2, 2A, 2C, or 2D in 40 CFR part 60 as appropriate, by the unobstructed (free) cross-sectional area of the flare tip.

(4) The maximum allowed velocity in m/s, V_{max} , for a flare complying with paragraph (d)(4)(iii) of this section shall be determined by the following equation:

$$\log_{10} V_{max} = (H_f - 28.8) / 31.7$$

where:

H_T = The net heating value as determined in paragraph (e)(2) of this section.

28.8 = Constant.

31.7 = Constant.

(5) The maximum allowed velocity in m/s, V_{max} , for an air-assisted flare shall be determined by the following equation:

$$V_{max} = 8.706 + 0.7064 (H_T)$$

where:

8.706 = Constant.

0.7064 = Constant.

H_T = The net heating value as determined in paragraph (e)(2) of this section.

(f) The owner or operator shall monitor and inspect each control device required to comply with this section to ensure proper operation and maintenance of the control device by implementing the following requirements:

(1) Install, calibrate, maintain, and operate according to the manufacturer's specifications a flow indicator that provides a record of vent stream flow from each affected process vent to the control device at least once every hour. The flow indicator sensor shall be installed in the vent stream at the nearest feasible point to the control device inlet, but before being combined with other vent streams.

(2) Install, calibrate, maintain, and operate according to the manufacturer's specifications a device to continuously monitor control device operation as specified below:

(i) For a thermal vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the combustion chamber downstream of the combustion zone.

(ii) For a catalytic vapor incinerator, a temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. One temperature sensor shall be installed in the vent stream at the nearest feasible point to the catalyst bed inlet and a second temperature sensor shall be installed in the vent stream at the near-

est feasible point to the catalyst bed outlet.

(iii) For a flare, a heat sensing monitoring device equipped with a continuous recorder that indicates the continuous ignition of the pilot flame.

(iv) For a boiler or process heater having a design heat input capacity less than 44 MW, a temperature monitoring device equipped with a continuous recorder. The device shall have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. The temperature sensor shall be installed at a location in the furnace downstream of the combustion zone.

(v) For a boiler or process heater having a design heat input capacity greater than or equal to 44 MW, a monitoring device equipped with a continuous recorder to measure a parameter(s) that indicates good combustion operating practices are being used.

(vi) For a condenser, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the condenser; or

(B) A temperature monitoring device equipped with a continuous recorder. The device shall be capable of monitoring temperature at two locations and have an accuracy of ± 1 percent of the temperature being monitored in $^{\circ}\text{C}$ or $\pm 0.5^{\circ}\text{C}$, whichever is greater. One temperature sensor shall be installed at a location in the exhaust vent stream from the condenser, and a second temperature sensor shall be installed at a location in the coolant fluid exiting the condenser.

(vii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly in the control device, either:

(A) A monitoring device equipped with a continuous recorder to measure the concentration level of the organic compounds in the exhaust vent stream from the carbon bed; or

(B) A monitoring device equipped with a continuous recorder to measure a parameter that indicates the carbon bed is regenerated on a regular, predetermined time cycle.

(3) Inspect the readings from each monitoring device required by para-

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graphs (f) (1) and (2) of this section at least once each operating day to check control device operation and, if necessary, immediately implement the corrective measures necessary to ensure the control device operates in compliance with the requirements of this section.

(g) An owner or operator using a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device, shall replace the existing carbon in the control device with fresh carbon at a regular, predetermined time interval that is no longer than the carbon service life established as a requirement of § 265.1035(b)(4)(iii)(F).

(h) An owner or operator using a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device shall replace the existing carbon in the control device with fresh carbon on a regular basis by using one of the following procedures:

(1) Monitor the concentration level of the organic compounds in the exhaust vent stream from the carbon adsorption system on a regular schedule and replace the existing carbon with fresh carbon immediately when carbon breakthrough is indicated. The monitoring frequency shall be daily or at an interval no greater than 20 percent of the time required to consume the total carbon working capacity established as a requirement of § 265.1035(b)(4)(iii)(G), whichever is longer.

(2) Replace the existing carbon with fresh carbon at a regular, predetermined time interval that is less than the design carbon replacement interval established as a requirement of § 265.1035(b)(4)(iii)(G).

(i) An owner or operator of an affected facility seeking to comply with the provisions of this part by using a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system is required to develop documentation including sufficient information to describe the control device operation and identify the process parameter or parameters that indicate proper oper-

ation and maintenance of the control device.

(1)(i) Closed-vent systems shall be designed for and operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background and by visual inspections, as determined by the methods specified as § 265.1034(b).

(2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring, which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator. For the annual leak detection monitoring after the initial leak detection monitoring, the owner or operator is not required to monitor those closed-vent system components which continuously operate in vacuum service or those closed-vent system joints, seams, or other connections that are permanently or semi-permanently sealed (e.g., a welded joint between two sections of metal pipe or a bolted and gasketed pipe flange).

(3) Detectable emissions, as indicated by an instrument reading greater than 500 ppm and visual inspections, shall be controlled as soon as practicable, but not later than 15 calendar days after the emission is detected.

(4) A first attempt at repair shall be made no later than 5 calendar days after the emission is detected.

(k) Closed-vent systems and control devices used to comply with provisions of this subpart shall be operated at all times when emissions may be vented to them.

(l) The owner or operator using a carbon adsorption system shall document that all carbon removed from the control device is managed in one of the following manners:

(1) Regenerated or reactivated in a thermal treatment unit that is permitted under subpart X of 40 CFR part 264 or subpart P of this part;

(2) Incinerated by a process that is permitted under subpart O of 40 CFR part 264 or subpart O of this part; or

(3) Burned in a boiler or industrial furnace that is permitted under subpart H of part 266 of this chapter.

[59 FR 62365, Dec. 6, 1994]

EFFECTIVE DATE NOTE: At 59 FR 62935, Dec. 6, 1994, in § 265.1033, paragraph (1)(K2) was revised and paragraph (1) was added. At 60 FR 26828, May 19, 1995, the effective date was delayed to December 6, 1995. For the convenience of the reader, the superseded material is set out below.

* * * * *

(1)(K1) * * *

(2) Closed-vent systems shall be monitored to determine compliance with this section during the initial leak detection monitoring which shall be conducted by the date that the facility becomes subject to the provisions of this section, annually, and at other times as requested by the Regional Administrator.

§ 265.1034 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) When a closed-vent system is tested for compliance with no detectable emissions, as required in § 265.1033(i), the test shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be:

(i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of

$$E_a = Q_{av} \left[\sum_{i=1}^n C_i MW_i \right] [0.0416] (10^{-6})$$

where:

E_a = Total organic mass flow rate, kg/h;

Q_{av} = Volumetric flow rate of gases entering or exiting control device, as determined by Method 2, dscm/h;

n = Number of organic compounds in the vent gas;

C_i = Organic concentration in ppm, dry basis, of compound i in the vent gas, as determined by Method 18;

MW_i = Molecular weight of organic compound i in the vent gas, kg/kg-mol;

0.0416 = Conversion factor for molar volume, kg-mol/m³ (@ 293 K and 760 mm Hg);

10⁻⁶ = Conversion from ppm, ppm⁻¹.

(v) The annual total organic emission rate shall be determined by the following equation:

$$E_a = (E_a) (H)$$

where:

E_a = Total organic mass emission rate, kg/y;

H = Total organic mass flow rate for the process vent, kg/h;

H = Total annual hours of operations for the affected unit, h.

(vi) Total organic emissions from all affected process vents at the facility shall be determined by summing the hourly total organic mass emission rates (E_a , as determined in paragraph (c)(1)(iv) of this section) and by summing the annual total organic mass emission rates (E_a , as determined in paragraph (c)(1)(v) of this section) for all affected process vents at the facility.

(2) The owner or operator shall record such process information as may be necessary to determine 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.

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

(i) Sampling ports adequate for the test methods specified in paragraph (c)(1) of this section.

(ii) Safe sampling platform(s).

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

(iv) Utilities for sampling and testing equipment.

(4) For the purpose of making compliance determinations, the time-weighted average of the 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 irre-

placeable portion of the sample train, extreme meteorological conditions, or other circumstances beyond the owner or operator's control, compliance may, upon the Regional Administrator's approval, be determined using the average of the results of the two other runs.

(d) To show that a process vent associated with a hazardous waste distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation is not subject to the requirements of this subpart, the owner or operator must make an initial determination that the time-weighted, annual average total organic concentration of the waste managed by the waste management unit is less than 10 ppmw using one of the following two methods:

(1) Direct measurement of the organic concentration of the waste using the following procedures:

(i) The owner or operator must take a minimum of four grab samples of waste for each waste stream managed in the affected unit under process conditions expected to cause the maximum waste organic concentration.

(ii) For waste generated onsite, the grab samples must be collected at a point before the waste is exposed to the atmosphere such as in an enclosed pipe or other closed system that is used to transfer the waste after generation to the first affected distillation fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation. For waste generated offsite, the grab samples must be collected at the inlet to the first waste management unit that receives the waste provided the waste has been transferred to the facility in a closed system such as a tank truck and the waste is not diluted or mixed with other waste.

(iii) Each sample shall be analyzed and the total organic concentration of the sample shall be computed using Method 9060 or 8240 of SW-846 (incorporated by reference under § 260.11).

(iv) The arithmetic mean of the results of the analyses of the four samples shall apply for each waste stream managed in the unit in determining the time-weighted, annual average total organic concentration of the waste. The time-weighted average is to be calculated using the annual quantity of

each waste stream processed and the mean organic concentration of each waste stream managed in the unit.

(2) Using knowledge of the waste to determine that its total organic concentration is less than 10 ppmw. Documentation of the waste determination is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to generate a waste stream having a total organic content less than 10 ppmw, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) The determination that distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operations manage hazardous wastes with time-weighted annual average total organic concentrations less than 10 ppmw shall be made as follows:

(1) By the effective date that the facility becomes subject to the provisions of this subpart or by the date when the waste is first managed in a waste management unit, whichever is later; and

(2) For continuously generated waste, annually; or

(3) Whenever there is a change in the waste being managed or a change in the process that generates or treats the waste.

(f) When an owner or operator and the Regional Administrator do not agree on whether a distillation, fractionation, thin-film evaporation, solvent extraction, or air or steam stripping operation manages a hazardous waste with organic concentrations of at least 10 ppmw based on knowledge of the waste, the procedures in Method 8240 can be used to resolve the dispute.

[55 FR 25507, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

management unit is operating at the highest load or capacity level reasonably expected to occur. If the owner or operator takes any action (e.g., managing a waste of different composition or increasing operating hours of affected waste management units) that would result in an increase in total organic emissions from affected process vents at the facility, then a new determination is required.

(3) Where an owner or operator chooses to use test data to determine the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan. The test plan must include:

(i) A description of how it is determined that the planned test is going to be conducted when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur. This shall include the estimated or design flow rate and organic content of each vent stream and define the acceptable operating ranges of key process and control device parameters during the test program.

(ii) A detailed engineering description of the closed-vent system and control device including:

(A) Manufacturer's name and model number of control device.

(B) Type of control device.

(C) Dimensions of the control device.

(D) Capacity.

(E) Construction materials.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(4) Documentation of compliance with § 265.1033 shall include the following information:

(i) A list of all information references and sources used in preparing the documentation.

(ii) Records, including the dates, of each compliance test required by § 265.1033(j).

(iii) If engineering calculations are used, a design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the

appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. Documentation provided by the control device manufacturer or vendor that describes the control device design in accordance with paragraphs (b)(4)(iii)(A) through (b)(4)(iii)(G) of this section may be used to comply with this requirement. The design analysis shall address the vent stream characteristics and control device operation parameters as specified below.

(A) For a thermal vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature in the combustion zone and the combustion zone residence time.

(B) For a catalytic vapor incinerator, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average temperature across the catalyst bed inlet and outlet.

(C) For a boiler or process heater, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also establish the design minimum and average flame zone temperatures, combustion zone residence time, and description of method and location where the vent stream is introduced into the combustion zone.

(D) For a flare, the design analysis shall consider the vent stream composition, constituent concentrations, and flow rate. The design analysis shall also consider the requirements specified in § 265.1033(d).

(E) For a condenser, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic compound concentration of the condenser average temperature of the condenser exhaust vent stream, and design aver-

age temperatures of the coolant fluid at the condenser inlet and outlet.

(F) For a carbon adsorption system such as a fixed-bed adsorber that regenerates the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design exhaust vent stream organic compound concentration level, number and capacity of carbon beds, type and working capacity of activated carbon used for carbon beds, design total steam flow over the period of each complete carbon bed regeneration cycle, duration of the carbon bed steaming and cooling/drying cycles, design carbon bed temperature after regeneration, design carbon bed regeneration time, and design service life of carbon.

(G) For a carbon adsorption system such as a carbon canister that does not regenerate the carbon bed directly onsite in the control device, the design analysis shall consider the vent stream composition, constituent concentrations, flow rate, relative humidity, and temperature. The design analysis shall also establish the design outlet organic concentration level, capacity of carbon bed, type and working capacity of activated carbon used for carbon bed, and design carbon replacement interval based on the total carbon working capacity of the control device and source operating schedule.

(iv) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(v) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 percent or greater unless the total organic concentration limit of § 265.1032(a) is achieved at an efficiency less than 95 percent or the total organic emission limits of § 265.1032(a) for affected process vents at the facility can be attained by a control device involv-

ing vapor recovery at an efficiency less than 95 weight percent. A statement provided by the control device manufacturer or vendor certifying that the control equipment meets the design specifications may be used to comply with this requirement.

(vi) If performance tests are used to demonstrate compliance, all test results.

(c) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control device required to comply with the provisions of this part shall be recorded and kept up-to-date in the facility operating record. The information shall include:

(1) Description and date of each modification that is made to the closed-vent system or control device design.

(2) Identification of operating parameter, description of monitoring device, and diagram of monitoring sensor location or locations used to comply with § 265.1033(f)(1) and (f)(2).

(3) Monitoring, operating and inspection information required by paragraphs (f) through (j) of § 265.1033.

(4) Date, time, and duration of each period that occurs while the control device is operating when any monitored parameter exceeds the value established in the control device design analysis as specified below:

(i) For a thermal vapor incinerator designed to operate with a minimum residence time of 0.50 seconds at a minimum temperature of 760 °C: period when the combustion temperature is below 760 °C.

(ii) For a thermal vapor incinerator designed to operate with an organic emission reduction efficiency of 95 percent or greater, period when the combustion zone temperature is more than 28 °C below the design average combustion zone temperature established as a requirement of paragraph (b)(4)(iii)(A) of this section.

(iii) For a catalytic vapor incinerator, period when:

(A) Temperature of the vent stream at the catalyst bed inlet is more than 28 °C below the average temperature of the inlet vent stream established as a requirement of paragraph (b)(4)(iii)(B) of this section; or

(B) Temperature difference across the catalyst bed is less than 80 percent of the design average temperature difference established as a requirement of paragraph (b)(4)(iii)(B) of this section.

(iv) For a boiler or process heater, period when:

(A) Flame zone temperature is more than 28 °C below the design average flame zone temperature established as a requirement of paragraph (b)(4)(iii)(C) of this section; or

(B) Position changes where the vent stream is introduced to the combustion zone from the location established as a requirement of paragraph (b)(4)(iii)(C) of this section.

(v) For a flare, period when the pilot flame is not ignited.

(vi) For a condenser that complies with § 265.1033(f)(2)(vi)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the condenser are more than 20 percent greater than the design outlet organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(vii) For a condenser that complies with § 265.1033(f)(2)(vi)(B), period when:

(A) Temperature of the exhaust vent stream from the condenser is more than 6 °C above the design average exhaust vent stream temperature established as a requirement of paragraph (b)(4)(iii)(E) of this section; or

(B) Temperature of the coolant fluid exiting the condenser is more than 6 °C above the design average coolant fluid temperature at the condenser outlet established as a requirement of paragraph (b)(4)(iii)(E) of this section.

(viii) For a carbon adsorption system such as a fixed-bed carbon adsorber that regenerates the carbon bed directly onsite in the control device and complies with § 265.1033(f)(2)(vii)(A), period when the organic compound concentration level or readings of organic compounds in the exhaust vent stream from the carbon bed are more than 20 percent greater than the design exhaust vent stream organic compound concentration level established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(ix) For a carbon adsorption system such as a fixed-bed carbon adsorber

that regenerates the carbon bed directly onsite in the control device and complies with § 265.1033(f)(2)(vii)(B), period when the vent stream continues to flow through the control device beyond the predetermined carbon bed regeneration time established as a requirement of paragraph (b)(4)(iii)(F) of this section.

(5) Explanation for each period recorded under paragraph (c)(4) of this section of the cause for control device operating parameter exceeding the design value and the measures implemented to correct the control device operation.

(6) For carbon adsorption systems operated subject to requirements specified in § 265.1033(g) or § 265.1033(h)(2), date when existing carbon in the control device is replaced with fresh carbon.

(7) For carbon adsorption systems operated subject to requirements specified in § 265.1033(h)(1), a log that records:

(i) Date and time when control device is monitored for carbon breakthrough and the monitoring device reading.

(ii) Date when existing carbon in the control device is replaced with fresh carbon.

(8) Date of each control device startup and shutdown.

(d) Records of the monitoring, operating, and inspection information required by paragraphs (c)(3) through (c)(8) of this section need be kept only 3 years.

(e) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(f) Up-to-date information and data used to determine whether or not a process vent is subject to the requirements in § 265.1032 including supporting documentation as required by § 265.1034(d)(2) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used, shall be

recorded in a log that is kept in the facility operating record.
[55 FR 25507, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 265.1036—265.1049 [Reserved]

Subpart B8—Air Emission Standards for Equipment Leaks

Source: 55 FR 25512, June 21, 1990, unless otherwise noted.

§ 265.1050 Applicability.

- (a) The regulations in this subpart apply to owners and operators of facilities that treat, store, or dispose of hazardous wastes (except as provided in § 265.11).
- (b) Except as provided in § 265.1054(j), this subpart applies to equipment that contains or contacts hazardous wastes with organic concentrations of at least 10 percent by weight that are managed in:

- (1) Units that are subject to the permitting requirements of part 270, or
- (2) Hazardous waste recycling units that are located on hazardous waste management facilities otherwise subject to the permitting requirements of part 270.
- (c) Each piece of equipment to which this subpart applies shall be marked in such a manner that it can be distinguished readily from other pieces of equipment.
- (d) Equipment that is in vacuum service is excluded from the requirements of § 265.1052 to § 265.1050 if it is identified as required in § 265.1054(g)(5).

[Note: The requirements of § 265.1052 through 265.1054 apply to equipment associated with hazardous waste recycling units previously exempt under paragraph 261.6(c)(1). Other exemptions under § 261.4, 262.34, and 265.1(c) are not affected by these requirements.]

§ 265.1051 Definitions.

As used in this subpart, all terms shall have the meaning given them in § 264.1031, the Act, and parts 260-266.

§ 265.1052 Standards: Pumps in light liquid service.

- (a)(1) Each pump in light liquid service shall be monitored monthly to detect leaks by the methods specified in

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- (ii) The owner or operator must determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system, or both.

(6)(i) If there are indications of liquids dripping from the pump seal or the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined in paragraph (d)(5)(ii) of this section, a leak is detected.

- (ii) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(iii) A first attempt at repair (e.g., relapping the seal) shall be made no later than 5 calendar days after each leak is detected.

- (e) Any pump that is designated, as described in § 265.1054(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraphs (a), (c), and (d) of this section if the pump meets the following requirements:

- (1) Must have no externally actuated shaft penetrating the pump housing.
- (2) Must operate with no detectable emissions as indicated by an instrument reading of less than 500 ppm above background as measured by the methods specified in § 265.1053(c).

- (3) Must be tested for compliance with paragraph (e)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(f) If any pump is equipped with a closed-vent system capable of capturing and transporting any leakage from the seal or seals to a control device that complies with the requirements of § 265.1050, it is exempt from the requirements of paragraphs (a) through (e) of this section.

[55 FR 25512, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 265.1053 Standards: Compressors.

- (a) Each compressor shall be equipped with a seal system that includes a barrier fluid system and that prevents leakage of total organic emissions to the atmosphere, except as pro-

vided in paragraphs (h) and (i) of this section.

- (b) Each compressor seal system as required in paragraph (a) of this section shall be:

(1) Operated with the barrier fluid at a pressure that is at all times greater than the compressor stuffing box pressure, or

(2) Equipped with a barrier fluid system that is connected by a closed-vent system to a control device that complies with the requirements of § 265.1050, or

(3) Equipped with a system that purges the barrier fluid into a hazardous waste stream with no detectable emissions to atmosphere.

(c) The barrier fluid must not be a hazardous waste with organic concentrations 10 percent or greater by weight.

(d) Each barrier fluid system as described in paragraphs (a) through (c) of this section shall be equipped with a sensor that will detect failure of the seal system, barrier fluid system, or both.

(e)(1) Each sensor as required in paragraph (d) of this section shall be checked daily or shall be equipped with an audible alarm that must be checked monthly to ensure that it is functioning properly unless the compressor is located within the boundary of an un-

manned plant site, in which case the sensor must be checked daily.

(2) The owner or operator shall determine, based on design considerations and operating experience, a criterion that indicates failure of the seal system, the barrier fluid system or both.

(f) If the sensor indicates failure of the seal system, the barrier fluid system, or both based on the criterion determined under paragraph (e)(2) of this section, a leak is detected.

(g)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(2) A first attempt at repair (e.g., tightening the packing gland) shall be made no later than 5 calendar days after each leak is detected.

(h) A compressor is exempt from the requirements of paragraphs (a) and (b) of this section if it is equipped with a

closed-vent system capable of capturing and transporting any leakage from the seal to a control device that complies with the requirements of § 265.1060, except as provided in paragraph (f) of this section.

(1) Any compressor that is designated, as described in § 265.1064(g)(2), for no detectable emission as indicated by an instrument reading of less than 500 ppm above background is exempt from the requirements of paragraphs (a) through (h) of this section if the compressor:

(1) Is determined to be operating with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(2) Is tested for compliance with paragraph (f)(1) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

§ 265.1054 Standards: Pressure relief devices in gas/vapor service.

(a) Except during pressure releases, each pressure relief device in gas/vapor service shall be operated with no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(b)(1) After each pressure release, the pressure relief device shall be returned to a condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as soon as practicable, but no later than 5 calendar days after each pressure release, except as provided in § 265.1059.

(2) No later than 5 calendar days after the pressure release, the pressure relief device shall be monitored to confirm the condition of no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, as measured by the method specified in § 265.1063(c).

(c) Any pressure relief device that is equipped with a closed-vent system capable of capturing and transporting leakage from the pressure relief device to a control device as described in § 265.1060 is exempt from the require-

ments of paragraphs (a) and (b) of this section.

§ 265.1055 Standards: Sampling connecting systems.

(a) Each sampling connection system shall be equipped with a closed-purge system or closed-vent system.

(b) Each closed-purge system or closed-vent system as required in paragraph (a) shall:

(1) Return the purged hazardous waste stream directly to the hazardous waste management process line with no detectable emissions to atmosphere, or

(2) Collect and recycle the purged hazardous waste stream with no detectable emissions to atmosphere, or

(3) Be designed and operated to capture and transport all the purged hazardous waste stream to a control device that complies with the requirements of § 265.1060.

(c) *In situ* sampling systems are exempt from the requirements of paragraphs (a) and (b) of this section.

§ 265.1056 Standards: Open-ended valves or lines.

(a)(1) Each open-ended valve or line shall be equipped with a cap, blind flange, plug, or a second valve.

(2) The cap, blind flange, plug, or second valve shall seal the open end at all times except during operations requiring hazardous waste stream flow through the open-ended valve or line.

(b) Each open-ended valve or line equipped with a second valve shall be operated in a manner such that the valve on the hazardous waste stream end is closed before the second valve is closed.

(c) When a double block and bleed system is being used, the bleed valve or line may remain open during operations that require venting the line between the block valves but shall comply with paragraph (a) of this section at all other times.

§ 265.1057 Standards: Valves in gas/vapor service or in light liquid service.

(a) Each valve in gas/vapor or light liquid service shall be monitored monthly to detect leaks by the methods specified in § 265.1063(b) and shall

monitor because monitoring personnel would be exposed to an immediate danger as a consequence of complying with paragraph (a) of this section.

(2) The owner or operator of the valve adheres to a written plan that requires monitoring of the valve as frequently as practicable during safe-to-monitor times.

(h) Any valve that is designated, as described in § 265.1064(h)(2), as a difficult-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.

(2) The hazardous waste management unit within which the valve is located was in operation before June 21, 1990.

(3) The owner or operator of the valve follows a written plan that requires monitoring of the valve at least once per calendar year.

§ 265.1058 Standards: Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors.

(a) Pumps and valves in heavy liquid service, pressure relief devices in light liquid or heavy liquid service, and flanges and other connectors shall be monitored within 5 days by the method specified in § 265.1063(b) if evidence of a potential leak is found by visual, audible, olfactory, or any other detection method.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) When a leak is detected, it shall be repaired as soon as practicable, but not later than 15 calendar days after it is detected, except as provided in § 265.1059.

(2) The first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(d) First attempts at repair include, but are not limited to, the best practices described under § 265.1057(e).

§ 265.1059 Standards: Delay of repair.

(a) Delay of repair of equipment for which leaks have been detected will be

comply with paragraphs (b) through (e) of this section, except as provided in paragraphs (f), (g), and (h) of this section and §§ 265.1061 and 265.1062.

(b) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(c)(1) Any valve for which a leak is not detected for two successive months may be monitored the first month of every succeeding quarter, beginning with the next quarter, until a leak is detected.

(2) If a leak is detected, the valve shall be monitored monthly until a leak is not detected for 2 successive months.

(d)(1) When a leak is detected, it shall be repaired as soon as practicable, but no later than 15 calendar days after the leak is detected, except as provided in § 265.1059.

(2) A first attempt at repair shall be made no later than 5 calendar days after each leak is detected.

(e) First attempts at repair include, but are not limited to, the following best practices where practicable:

(1) Tightening of bonnet bolts.

(2) Replacement of bonnet bolts.

(3) Tightening of packing gland nuts.

(4) Injection of lubricant into lubricated packing.

(f) Any valve that is designated, as described in § 265.1064(g)(2), for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, is exempt from the requirements of paragraph (a) of this section if the valve:

(1) Has no external actuating mechanism in contact with the hazardous waste stream.

(2) Is operated with emissions less than 500 ppm above background as determined by the method specified in § 265.1063(c).

(3) Is tested for compliance with paragraph (f)(2) of this section initially upon designation, annually, and at other times as requested by the Regional Administrator.

(g) Any valve that is designated, as described in § 265.1064(h)(1), as an unsafe-to-monitor valve is exempt from the requirements of paragraph (a) of this section if:

(1) The owner or operator of the valve determines that the valve is unsafe to

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§ 265.1061 Alternative standards for valves in gas/vapor service or in light liquid service: percentage of valves allowed to leak.

(a) An owner or operator subject to the requirements of § 265.1057 may elect to have all valves within a hazardous waste management unit comply with an alternative standard which allows no greater than 2 percent of the valves to leak.

(b) The following requirements shall be met if an owner or operator decides to comply with the alternative standard of allowing 2 percent of valves to leak:

(1) An owner or operator must notify the Regional Administrator that the owner or operator has elected to comply with the requirements of this section.

(2) A performance test as specified in paragraph (c) of this section shall be conducted initially upon designation, annually, and at other times requested by the Regional Administrator.

(3) If a valve leak is detected, it shall be repaired in accordance with § 265.1057 (d) and (e).

(c) Performance tests shall be conducted in the following manner:

(1) All valves subject to the requirements in § 265.1057 within the hazardous waste management unit shall be monitored within 1 week by the methods specified in § 265.1063(b).

(2) If an instrument reading of 10,000 ppm or greater is measured, a leak is detected.

(3) The leak percentage shall be determined by dividing the number of valves subject to the requirements in § 265.1057 for which leaks are detected by the total number of valves subject to the requirements in § 265.1057 within the hazardous waste management unit.

(d) If an owner or operator decides no longer to comply with this section, the owner or operator must notify the Regional Administrator in writing that the work practice standard described in § 265.1057 (a) through (e) will be followed.

allowed if the repair is technically infeasible without a hazardous waste management unit shutdown. In such a case, repair of this equipment shall occur before the end of the next hazardous waste management unit shutdown.

(b) Delay of repair of equipment for which leaks have been detected will be allowed for equipment that is isolated from the hazardous waste management unit and that does not continue to contain or contact hazardous waste with organic concentrations at least 10 percent by weight.

(c) Delay of repair for valves will be allowed if:

(1) The owner or operator determines that emissions of purged material resulting from immediate repair are greater than the emissions likely to result from delay of repair.

(2) When repair procedures are effected, the purged material is collected and destroyed or recovered in a control device complying with § 265.1060.

(d) Delay of repair for pumps will be allowed if:

(1) Repair requires the use of a dual mechanical seal system that includes a barrier fluid system.

(2) Repair is completed as soon as practicable, but not later than 6 months after the leak was detected.

(e) Delay of repair beyond a hazardous waste management unit shutdown will be allowed for a valve if valve assembly replacement is necessary during the hazardous waste management unit shutdown, valve assembly supplies have been depleted, and valve assembly supplies had been sufficiently stocked before the supplies were depleted. Delay of repair beyond the next hazardous waste management unit shutdown will not be allowed unless the next hazardous waste management unit shutdown occurs sooner than 6 months after the first hazardous waste management unit shutdown.

§ 265.1060 Standards: Closed-vent systems and control devices.

Owners or operators of closed-vent systems and control devices shall comply with the provisions of § 265.1033.

§ 265.1062 Alternative standards for valves in gas/vapor service or in light liquid service: skip period leak detection and repair.

(a)(1) An owner or operator subject to the requirements of § 265.1057 may elect for all valves within a hazardous waste management unit to comply with one of the alternative work practices specified in paragraphs (b) (2) and (3) of this section.

(2) An owner or operator must notify the Regional Administrator before implementing one of the alternative work practices.

(b)(1) An owner or operator shall comply with the requirements for valves, as described in § 265.1057, except as described in paragraphs (b)(2) and (b)(3) of this section.

(2) After two consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip one of the quarterly leak detection periods for the valves subject to the requirements in § 265.1057.

(3) After five consecutive quarterly leak detection periods with the percentage of valves leaking equal to or less than 2 percent, an owner or operator may begin to skip three of the quarterly leak detection periods for the valves subject to the requirements in § 265.1057.

(4) If the percentage of valves leaking is greater than 2 percent, the owner or operators shall monitor monthly in compliance with the requirements in § 265.1057, but may again elect to use this section after meeting the requirements of § 265.1057(c)(1).

§ 265.1063 Test methods and procedures.

(a) Each owner or operator subject to the provisions of this subpart shall comply with the test methods and procedures requirements provided in this section.

(b) Leak detection monitoring, as required in §§ 265.1052 through 265.1062, shall comply with the following requirements:

(1) Monitoring shall comply with Reference Method 21 in 40 CFR part 60.

(2) The detection instrument shall meet the performance criteria of Reference Method 21.

(3) The instrument shall be calibrated before use on each day of its use by the procedures specified in Reference Method 21.

(4) Calibration gases shall be: (i) Zero air (less than 10 ppm of hydrocarbon in air).

(ii) A mixture of methane or n-hexane and air at a concentration of approximately, but less than, 10,000 ppm methane or n-hexane.

(5) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(c) When equipment is tested for compliance with no detectable emissions, as required in § 265.1052(e), 265.1053(f), 265.1054, and 265.1057(f), the test shall comply with the following requirements:

(1) The requirements of paragraphs (b) (1) through (4) of this section shall apply.

(2) The background level shall be determined, as set forth in Reference Method 21.

(3) The instrument probe shall be traversed around all potential leak interfaces as close to the interface as possible as described in Reference Method 21.

(4) The arithmetic difference between the maximum concentration indicated by the instrument and the background level is compared with 500 ppm for determining compliance.

(d) In accordance with the waste analysis plan required by § 265.13(b), an owner or operator of a facility must determine, for each piece of equipment, whether the equipment contains or contacts a hazardous waste with organic concentration that equals or exceeds 10 percent by weight using the following:

(1) Methods described in ASTM Methods D 2287-88, E 169-87, E 168-88, E 260-85 (incorporated by reference under § 260.11);

(2) Method 9060 or 8240 of SW-846 (incorporated by reference under § 260.11); or

(3) Application of the knowledge of the nature of the hazardous waste

stream or the process by which it was produced. Documentation of a waste determination by knowledge is required. Examples of documentation that shall be used to support a determination under this provision include production process information documenting that no organic compounds are used, information that the waste is generated by a process that is identical to a process at the same or another facility that has previously been demonstrated by direct measurement to have a total organic content less than 10 percent, or prior speciation analysis results on the same waste stream where it can also be documented that no process changes have occurred since that analysis that could affect the waste total organic concentration.

(e) If an owner or operator determines that a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the determining the can be revised only after following the procedures in paragraph (d)(1) or (d)(2) of this section.

(f) When an owner or operator and the Regional Administrator do not agree on whether a piece of equipment contains or contacts a hazardous waste with organic concentrations at least 10 percent by weight, the procedures in paragraph (d)(1) or (d)(2) of this section can be used to resolve the dispute.

(g) Samples used in determining the percent organic content shall be representative of the highest total organic content hazardous waste that is expected to be contained in or contact the equipment.

(h) To determine if pumps or valves are in light liquid service, the vapor pressures of constituents may be obtained from standard reference texts or may be determined by ASTM D-2879-86 (incorporated by reference under § 260.11).

(i) Performance tests to determine if a control device achieves 95 weight percent organic emission reduction shall comply with the procedures of § 265.1034 (c)(1) through (c)(4).

§ 265.1064 Recordkeeping requirements.

(a)(1) Each owner or operator subject to the provisions of this subpart shall

comply with the recordkeeping requirements of this section.

(2) An owner or operator of more than one hazardous waste management unit subject to the provisions of this subpart may comply with the recordkeeping requirements for these hazardous waste management units in one recordkeeping system if the system identifies each record by each hazardous waste management unit.

(b) Owners and operators must record the following information in the facility operating record:

(1) For each piece of equipment to which subpart BB of part 265 applies:

(i) Equipment identification number and hazardous waste management unit identification.

(ii) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

(iii) Type of equipment (e.g., a pump or pipeline valve).

(iv) Percent-by-weight total organics in the hazardous waste stream at the equipment.

(v) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(vi) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(2) For facilities that comply with the provisions of § 265.1033(a)(2), an implementation schedule as specified in § 265.1033(a)(2).

(3) Where an owner or operator chooses to use test data to demonstrate the organic removal efficiency or total organic compound concentration achieved by the control device, a performance test plan as specified in § 265.1035(b)(3).

(4) Documentation of compliance with § 265.1060, including the detailed design documentation or performance test results specified in § 265.1035(b)(4).

(c) When each leak is detected as specified in §§ 265.1052, 265.1053, 265.1057, and 265.1058, the following requirements apply:

(1) A weatherproof and readily visible identification, marked with the equipment identification number, the date evidence of a potential leak was found in accordance with § 265.1058(a), and the

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date the leak was detected, shall be attached to the leaking equipment.

(2) The identification on equipment, except on a valve, may be removed after it has been repaired.

(3) The identification on a valve may be removed after it has been monitored for 2 successive months as specified in § 265.1057(c) and no leak has been detected during those 2 months.

(d) When each leak is detected as specified in §§ 265.1052, 265.1053, 265.1057, and 265.1058, the following information shall be recorded in an inspection log and shall be kept in the facility operating record:

(1) The instrument and operator identification numbers and the equipment identification number.

(2) The date evidence of a potential leak was found in accordance with § 265.1058(a).

(3) The date the leak was detected and the dates of each attempt to repair the leak.

(4) Repair methods applied in each attempt to repair the leak.

(5) "Above 10,000" if the maximum instrument reading measured by the methods specified in § 265.1063(b) after each repair attempt is equal to or greater than 10,000 ppm.

(6) "Repair delayed" and the reason for the delay if a leak is not repaired within 15 calendar days after discovery of the leak.

(7) Documentation supporting the delay of repair of a valve in compliance with § 265.1059(c).

(8) The signature of the owner or operator (or designate) whose decision it was that repair could not be effected without a hazardous waste management unit shutdown.

(9) The expected date of successful repair of the leak if a leak is not repaired within 15 calendar days.

(10) The date of successful repair of the leak.

(e) Design documentation and monitoring, operating, and inspection information for each closed-vent system and control devices required to comply with the provisions of § 265.1060 shall be recorded and kept up-to-date in the facility operating record as specified in § 265.1035(c). Design documentation is specified in § 265.1035 (c)(1) and (c)(2) and monitoring, operating, and

Inspection information in § 265.1035 (c)(3)-(c)(8).

(f) For a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system, monitoring and inspection information indicating proper operation and maintenance of the control device must be recorded in the facility operating record.

(g) The following information pertaining to all equipment subject to the requirements in §§ 265.1052 through 265.1060 shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for equipment (except welded fittings) subject to the requirements of this subpart.

(2)(i) A list of identification numbers for equipment that the owner or operator elects to designate for no detectable emissions, as indicated by an instrument reading of less than 500 ppm above background, under the provisions of §§ 265.1052(e), 265.1053(i), and 265.1057(f).

(ii) The designation of this equipment as subject to the requirements of §§ 265.1052(e), 265.1053(i), or 265.1057(f) shall be signed by the owner or operator.

(3) A list of equipment identification numbers for pressure relief devices required to comply with § 265.1054(a).

(4)(i) The dates of each compliance test required in §§ 265.1052(e), 265.1053(i), 265.1054, and 265.1057(f).

(ii) The background level measured during each compliance test.

(iii) The maximum instrument reading measured at the equipment during each compliance test.

(5) A list of identification numbers for equipment in vacuum service.

(h) The following information pertaining to all valves subject to the requirements of § 265.1057 (g) and (h) shall be recorded in a log that is kept in the facility operating record:

(1) A list of identification numbers for valves that are designated as unsafe to monitor, an explanation for each valve stating why the valve is unsafe to monitor, and the plan for monitoring each valve.

(2) A list of identification numbers for valves that are designated as dif-

fault to monitor, an explanation for each valve stating why the valve is difficult to monitor, and the planned schedule for monitoring each valve.

(1) The following information shall be recorded in the facility operating record for valves complying with § 265.1062:

- (1) A schedule of monitoring.
- (2) The percent of valves found leaking during each monitoring period.
- (3) The following information shall be recorded in a log that is kept in the facility operating record:

(1) Criteria required in §§ 265.1052 (d)(5)(1) and 265.1053(e)(2) and an explanation of the criteria.

(2) Any changes to these criteria and the reasons for the changes.

(k) The following information shall be recorded in a log that is kept in the facility operating record for use in determining exemptions as provided in the applicability section of this subpart and other specific subparts:

(1) An analysis determining the design capacity of the hazardous waste management unit.

(2) A statement listing the hazardous waste influent to and effluent from each hazardous waste management unit subject to the requirements in §§ 265.1052 through 265.1060 and an analysis determining whether these hazardous wastes are heavy liquids.

(3) An up-to-date analysis and the supporting information and data used to determine whether or not equipment is subject to the requirements in §§ 265.1052 through 265.1060. The record shall include supporting documentation as required by § 265.1063(d)(3) when application of the knowledge of the nature of the hazardous waste stream or the process by which it was produced is used. If the owner or operator takes any action (e.g., changing the process that produced the waste) that could result in an increase in the total organic content of the waste contained in or contacted by equipment determined not to be subject to the requirements in §§ 265.1052 through 265.1060, then a new determination is required.

(1) Records of the equipment leak information required by paragraph (d) of this section and the operating information required by paragraph (e) of this section need be kept only 3 years.

(m) The owner or operator of any facility that is subject to this subpart and to regulations at 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to determine compliance with this subpart by documentation either pursuant to § 265.1064 of this subpart, or pursuant to those provisions of 40 CFR part 60 or 61, to the extent that the documentation under the regulation at 40 CFR part 60 or part 61 duplicates the documentation required under this subpart. The documentation under the regulation at 40 CFR part 60 or part 61 shall be kept with or made readily available with the facility operating record.

(55 FR 25512, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991)

§ 265.1065—265.1079 [Reserved]

Subpart CC—Air Emission Standards for Tanks, Surface Impoundments, and Containers

Source: 59 FR 62935, Dec. 6, 1994, unless otherwise noted.

EFFECTIVE DATE NOTE: At 59 FR 62935, Dec. 6, 1994, Subpart CC, §§ 265.1080 through 265.1091 was added. At 60 FR 26828, May 19, 1995, the effective date was delayed to December 6, 1995.

§ 265.1080 Applicability.

(a) The requirements of this subpart apply to owners and operators of all facilities that treat, store, or dispose of hazardous waste in tanks, surface impoundments, or containers subject to either subparts I, J, or K of this part except as § 265.1 and paragraph (b) of this section provide otherwise.

(b) The requirements of this subpart do not apply to the following waste management units at the facility:

(1) A waste management unit that holds hazardous waste placed in the unit before December 6, 1995, and in which no hazardous waste is added to the unit on or after this date.

(2) A container that has a design capacity less than or equal to 0.1 m³.

(3) A tank in which an owner or operator has stopped adding hazardous waste and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

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(4) A surface impoundment in which an owner or operator has stopped adding hazardous waste (except to implement an approved closure plan) and the owner or operator has begun implementing or completed closure pursuant to an approved closure plan.

(5) A waste management unit that is used solely for on-site treatment or storage of hazardous waste that is generated as the result of implementing remedial activities required under the RCRA corrective action authorities of 3004(u), 3004(v) or 3008(h), CERCLA authorities, or similar Federal or State authorities.

(6) A waste management unit that is used solely for the management of radioactive mixed waste in accordance with all applicable regulations under the authority of the Atomic Energy Act and the Nuclear Waste Policy Act.

(c) For the owner and operator of a facility subject to this subpart who has received a final permit under RCRA section 3005 prior to December 6, 1995, the following requirements apply:

(1) The requirements of 40 CFR part 264, subpart CC shall be incorporated into the permit when the permit is reissued in accordance with the requirements of 40 CFR 124.15 or reviewed in accordance with the requirements of 40 CFR 270.50(d), the owner and operator is subject to the requirements of 40 CFR 270.50(d).

(2) Until the date when the permit is reissued in accordance with the requirements of 40 CFR 124.15 or reviewed in accordance with the requirements of 40 CFR 270.50(d), the owner and operator is subject to the requirements of this subpart.

(59 FR 62935, Dec. 6, 1994, as amended at 60 FR 26829, May 19, 1995)

EFFECTIVE DATE NOTE: At 60 FR 26829, May 19, 1995, in § 265.1080, paragraphs (b)(1) and (c) were revised, effective December 6, 1995. For the convenience of the reader, the superseded material is set out below.

§ 265.1080 Applicability.

(b) ***

(1) A waste management unit that holds hazardous waste placed in the unit before June 5, 1995, and in which no hazardous

waste is added to the unit on or after June 5, 1995.

(c) For the owner and operator of a facility subject to this subpart who has received a final permit under RCRA section 3005 prior to June 5, 1995, the following requirements apply:

§ 265.1081 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given to them in the Act and parts 260 through 266 of this chapter.

Average volatile organic concentration or *average VO concentration* means the mass-weighted average volatile organic concentration of a hazardous waste as determined in accordance with the requirements of § 265.1084 of this subpart.

Cover means a device or system which is placed on or over a hazardous waste such that the entire hazardous waste surface area is enclosed and sealed to reduce air emissions to the atmosphere. A cover may have openings such as access hatches, sampling ports, and gauge wells that are necessary for operation, inspection, maintenance, or repair of the unit on which the cover is installed and provided that each opening is closed and sealed when not in use. Examples of covers include a fixed roof installed on a tank, a floating membrane cover installed on a surface impoundment, a lid installed on a drum, and an enclosure in which an open container is placed during waste treatment.

External floating roof means a pontoon or double-deck type floating roof that rests on the surface of a hazardous waste being managed in a tank that has no fixed roof.

Fired roof means a rigid cover that is installed in a stationary position so that it does not move with fluctuations in the level of the hazardous waste placed in a tank.

Floating membrane cover means a cover consisting of a synthetic flexible membrane material that rests upon and is supported by the hazardous waste being managed in a surface impoundment.

Floating roof means a pontoon-type or double-deck type cover that rests upon and is supported by the hazardous waste being managed in a tank, and is equipped with a closure seal or seals to close the space between the cover edge and the tank wall.

Internal floating roof means a floating roof that rests or floats on the surface (but not necessarily in complete contact with it) of a hazardous waste being managed in a tank that has a fixed roof.

Liquid-mounted seal means a foam or liquid-filled primary seal mounted in contact with the hazardous waste between the tank wall and the floating roof continuously around the circumference of the tank.

Maximum organic vapor pressure means the equilibrium partial pressure exerted by the hazardous waste contained in a tank determined at the temperature equal to either: (1) the local maximum monthly average temperature as reported by the National Weather Service when the hazardous waste is stored or treated at ambient temperature; or (2) the highest calendar-month average temperature of the hazardous waste when the hazardous waste is stored at temperatures above the ambient temperature or when the hazardous waste is stored or treated at temperatures below the ambient temperature.

No detectable organic emissions means no escape of organics from a device or system to the atmosphere as determined by an instrument reading less than 500 parts per million by volume (ppmv) above the background level at each joint, fitting, and seal when measured in accordance with the requirements of Method 21 in 40 CFR part 60, appendix A, and by no visible openings or defects in the device or system such as rips, tears, or gaps.

Point of waste origination means as follows:

- (1) When the facility owner or operator is the generator of the hazardous waste, the point of waste origination means the point where a solid waste produced by a system, process, or waste management unit is determined to be a hazardous waste as defined in 40 CFR part 261.

(NOTE: In this case, this term is being used in a manner similar to the use of the term "point of generation" in air standards established for waste management operations under authority of the Clean Air Act in 40 CFR parts 60, 61, and 63.)

- (2) When the facility owner and operator are not the generator of the hazardous waste, point of waste origination means the point where the owner or operator accepts delivery or takes possession of the hazardous waste.

Point of waste treatment means the point where a hazardous waste exits a waste management unit used to destroy, degrade, or remove organics in the hazardous waste.

Vapor-mounted seal means a foam-filled primary seal mounted continuously around the circumference of the tank so that there is an annular vapor space underneath the seal. The annular vapor space is bounded by the bottom of the primary seal, the tank wall, the hazardous waste surface, and the floating roof.

Volatile organic concentration or VO concentration means the fraction by weight of organic compounds in a hazardous waste expressed in terms of parts per million (ppmw) as determined by direct measurement using Method 25D or by knowledge of the waste in accordance with the requirements of § 265.1084 of this subpart.

Waste determination means performing all applicable procedures in accordance with the requirements of § 265.1084 of this subpart to determine whether a hazardous waste meets standards specified in this subpart. Examples of a waste determination include performing the procedures in accordance with the requirements of § 265.1084 of this subpart to determine the average VO concentration of a hazardous waste at the point of waste origination; the average VO concentration of a hazardous waste at the point of waste treatment and comparing the results to the exit concentration limit specified for the process used to treat the hazardous waste; determining the organic reduction efficiency and the organic biodegradation efficiency for a biological process used to treat a hazardous waste and comparing the results to the applicable standards; or the maximum volatile organic vapor pressure for a

hazardous waste in a tank and comparing the results to the applicable standards.

Waste stabilization process means any physical or chemical process used to either reduce the mobility of hazardous constituents in a hazardous waste or eliminate free liquids as determined by Test Method 9095 (Paint Filter Liquids) in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference—refer to § 260.11 of this chapter). A waste stabilization process includes mixing the hazardous waste with binders or other materials, and curing the resulting hazardous waste and binder mixture. Other synonymous terms used to refer to this process are "waste fixation" or "waste solidification."

§ 265.1082 Schedule for implementation of air emission standards.

(a) Owners or operators of facilities existing on December 6, 1995, and subject to subparts I, J, and K of this part shall meet the following requirements:

- (1) Install and begin operation of all control equipment required by this subpart by December 6, 1995, except as provided for in paragraph (a)(2) of this section.

- (2) When control equipment required by this subpart cannot be installed and in operation by December 6, 1995, the owner or operator shall:

(i) Install and begin operation of the control equipment as soon as possible but no later than December 8, 1997.

(ii) Prepare an implementation schedule that includes the following information: specific calendar dates for award of contracts or issuance of purchase orders for the control equipment, initiation of on-site installation of the control equipment, completion of the control equipment installation, and performance of any testing to demonstrate that the installed equipment meets the applicable standards of this subpart.

(iii) For facilities subject to the recordkeeping requirements of § 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this

section in the operating record no later than December 6, 1995.

- (iv) For facilities not subject to § 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this section in a permanent, readily available file located at the facility no later than December 6, 1995.
- (b) Owners or operators of facilities in existence on the effective date of statutory or regulatory amendments under the Act that render the facility subject to subparts I, J, or K of this part shall meet the following requirements:

(1) Install and begin operation of all control equipment required by this subpart by the effective date of the amendment except as provided for in paragraph (b)(2) of this section.

(2) When control equipment required by this subpart cannot be installed and begin operation by the effective date of the amendment, the owner or operator shall:

(i) Install and operate the control equipment as soon as possible but no later than 30 months after the effective date of the amendment.

(ii) For facilities subject to the recordkeeping requirements of § 265.73, enter and maintain the implementation schedule specified in paragraph (a)(2)(ii) of this section in the operating record no later than the effective date of the amendment, or

(iii) For facilities not subject to § 265.73, the owner or operator shall enter and maintain the implementation schedule specified in paragraph (a)(2)(ii) of this section in a permanent, readily available file located at the facility site no later than the effective date of the amendment. (iii)(c) The Regional Administrator may elect to extend the implementation date for control equipment at a facility, on a case by case basis, to a date later than December 8, 1997, when special circumstances that are beyond the facility owner's or operator's control delay installation or operation of control equipment and the owner or operator has made all reasonable and prudent attempts to comply with the requirements of this subpart.

(59 FR 62935, Dec. 6, 1994, as amended at 60 FR 26823, May 19, 1995)

EFFECTIVE DATE NOTE: At 60 FR 26829, May 19, 1995, in § 265.1082, paragraphs (a) introductory text, (1), (2) introductory text, (iii) and (iv) were revised, effective December 6, 1995. For the convenience of the reader, the superseded text is set out below.

§ 265.1083 Schedule for implementation of air emission standards.

(a) Owners or operators of facilities existing on June 6, 1995, and subject to subparts I, J, and K of this part shall meet the following requirements:

(1) Install and begin operation of all control equipment required by this subpart on June 6, 1995, except as provided for in paragraph (a)(2) of this section.

(2) When control equipment required by this subpart cannot be installed and in operation by June 6, 1995, the owner or operator shall:

(iii) For facilities subject to the record-keeping requirements of § 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this section in the operating record no later than June 6, 1995.

(iv) For facilities not subject to § 265.73 of this part, the owner or operator shall enter the implementation schedule specified in paragraph (a)(2)(ii) of this section in a permanent, readily available file located at the facility no later than June 6, 1995.

§ 265.1083 Standards: General.

(a) This section applies to the management of hazardous waste in tanks, surface impoundments, and containers subject to this subpart.

(b) The owner or operator shall control air emissions from each waste management unit in accordance with standards specified in § 265.1085 through § 265.1088 of this subpart, as applicable to the waste management unit, except as provided for in paragraph (c) of this section.

(c) A waste management unit is exempted from standards specified in § 265.1085 through § 265.1088 of this subpart provided that all hazardous waste placed in the waste management unit is determined by the owner or operator to meet either of the following conditions:

(1) The average VO concentration of the hazardous waste at the point of waste origination is less than 100 parts

per million by weight (ppmw). The average VO concentration shall be determined by the procedures specified in § 265.1084(a) of this subpart.

(2) The organic content of the hazardous waste has been reduced by an organic destruction or removal process that achieves any one of the following conditions:

(i) A process that removes or destroys the organics contained in the hazardous waste to a level such that the average VO concentration of the hazardous waste at the point of waste treatment is less than the exit concentration limit (C_e) established for the process. The average VO concentration of the hazardous waste at the point of waste treatment and the exit concentration limit for the process shall be determined using the procedures specified in § 265.1084(b) of this subpart.

(ii) A process that removes or destroys the organics contained in the hazardous waste to a level such that the organic reduction efficiency (R) for the process is equal to or greater than 95 percent, and the average VO concentration of the hazardous waste at the point of waste treatment is less than 50 ppmw. The organic reduction efficiency for the process and the average VO concentration of the hazardous waste at the point of waste treatment shall be determined using the procedures specified in § 265.1084(b) of this subpart.

(iii) A process that removes or destroys the organics contained in the hazardous waste to a level such that the actual organic mass removal rate (MR) for the process is greater than the required organic mass removal rate (RMR) established for the process. The required organic mass removal rate and the actual organic mass removal rate for the process shall be determined using the procedures specified in § 265.1084(b) of this subpart.

(iv) A biological process that destroys or degrades the organics contained in the hazardous waste, such that either of the following conditions is met:

(A) The organic reduction efficiency (R) for the process is equal to or great-

er than 95 percent, and the organic biodegradation efficiency (R_{bio}) for the process is equal to or greater than 95 percent. The organic reduction efficiency and the organic biodegradation efficiency for the process shall be determined in accordance with the procedures specified in § 265.1084(b) of this subpart.

(B) The total actual organic mass biodegradation rate (MR_{bio}) for all hazardous waste treated by the process is equal to or greater than the required organic mass removal rate (RMR). The required organic mass removal rate and the actual organic mass biodegradation rate for the process shall be determined using the procedures specified in § 265.1084(b) of this subpart.

(v) A process that removes or destroys the organics contained in the hazardous waste and meets all of the following conditions:

(A) All of the materials entering the process are hazardous wastes.

(B) From the point of waste origination through the point where the hazardous waste enters the process, the hazardous waste is continuously managed in waste management units which use air emission controls in accordance with the standards specified in § 265.1085 through § 265.1088 of this subpart, as applicable to the waste management unit.

(C) The average VO concentration of the hazardous waste at the point of waste treatment is less than the lowest average VO concentration at the point of waste origination determined for each of the individual hazardous waste streams entering the process or 100 ppmw, whichever value is lower. The average VO concentration of each individual hazardous waste stream at the point of waste origination shall be determined using the procedure specified in § 265.1084(a) of this subpart. The average VO concentration of the hazardous waste at the point of waste treatment shall be determined using the procedure specified in § 265.1084(b) of this subpart.

(vi) A hazardous waste incinerator for which the owner or operator has elected:

(A) Been issued a final permit under 40 CFR part 270, and designs and oper-

ates the unit in accordance with the requirements of 40 CFR part 264, subpart O; or

(B) Has certified compliance with the interim status requirements of subpart O of this part.

(vii) A boiler or industrial furnace for which the owner or operator has either:

(A) Been issued a final permit under 40 CFR part 270, and designs and operates the unit in accordance with the requirements of 40 CFR part 268, subpart H; or

(B) Has certified compliance with the interim status requirements of 40 CFR part 268, subpart H.

(d) When a process is used for the purpose of treating a hazardous waste to meet one of the sets of conditions specified in paragraphs (c)(2)(i) through (c)(2)(v) of this section, each material removed from or exiting the process that is not a hazardous waste but has an average VO concentration equal to or greater than 100 ppmw shall be managed in a waste management unit in accordance with the requirements of paragraph (b) of this section.

(e) The Regional Administrator may at any time perform or request that the owner or operator perform a waste determination for a hazardous waste managed in a tank, surface impoundment, or container exempted from using air emission controls under the provisions of this section as follows:

(1) The waste determination for average VO concentration of a hazardous waste at the point of waste origination shall be performed using direct measurement in accordance with the applicable requirements of § 265.1084(a) of this subpart. The waste determination for a hazardous waste at the point of waste treatment shall be performed in accordance with the applicable requirements of § 265.1084(b) of this subpart.

(2) In a case when the owner or operator is requested to perform the waste determination, the Regional Administrator may elect to have an authorized representative observe the collection of the hazardous waste samples used for the analysis.

(3) In a case when the results of the waste determination performed or requested by the Regional Administrator do not agree with the results of a waste determination performed by the owner

or operator using knowledge of the waste, then the results of the waste determination performed in accordance with the requirements of paragraph (e)(1) of this section shall be used to establish compliance with the requirements of this subpart.

(4) In a case when the owner or operator has used an averaging period greater than 1 hour for determining the average VO concentration of a hazardous waste at the point of waste origination, the Regional Administrator may elect to establish compliance with this subpart by performing or requesting that the owner or operator perform a waste determination using direct measurements based on waste samples collected within a 1-hour period as follows:

(i) The average VO concentration of the hazardous waste at the point of waste origination shall be determined by direct measurement in accordance with the requirements of § 265.1084(a) of this subpart.

(ii) Results of the waste determination performed or requested by the Regional Administrator showing that the average VO concentration of the hazardous waste at the point of waste origination is equal to or greater than 100 ppmw shall constitute noncompliance with this subpart except in a case as provided for in paragraph (e)(4)(iii) of this section.

(iii) For the case when the average VO concentration of the hazardous waste at the point of waste origination previously has been determined by the owner or operator using an averaging period greater than 1 hour to be less than 100 ppmw but because of normal operating process variations the VO concentration of the hazardous waste determined by direct measurement for any given 1-hour period may be equal to or greater than 100 ppmw, information that was used by the owner or operator to determine the average VO concentration of the hazardous waste (e.g., test results, measurements, calculations, and other documentation) and recorded in the facility records in accordance with the requirements of § 265.1084(a) and § 265.1090 of this subpart shall be considered by the Regional Administrator together with the results of the waste determination performed or requested by the Regional Administrator shall:

trator in establishing compliance with this subpart.

§ 265.1084 Waste determination procedures.

(a) Waste determination procedure for volatile organic (VO) concentration of a hazardous waste at the point of waste origination.

(1) An owner or operator shall determine the average VO concentration at the point of waste origination for each hazardous waste placed in a waste management unit exempted under the provisions of § 265.1083(c)(1) of this subpart from using air emission controls in accordance with standards specified in § 265.1085 through § 265.1088 of this subpart, as applicable to the waste management unit.

(2) When the facility owner or operator is the generator of the hazardous waste, the owner or operator shall determine the average VO concentration of the hazardous waste using either direct measurement as specified in paragraph (a)(5) of this section or knowledge of the waste as specified in paragraph (a)(6) of this section for each hazardous waste generated as follows:

(i) When the hazardous waste is generated as part of a continuous process, the owner or operator shall:

(A) Perform an initial waste determination of the average VO concentration of the waste stream before the first time any portion of the material in the waste stream is placed in a waste management unit subject to this subpart, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(B) Perform a new waste determination whenever changes to the source generating the waste stream are reasonably likely to cause the average VO concentration of the hazardous waste to increase to a level that is equal to or greater than the applicable VO concentration limits specified in § 265.1083 of this subpart.

(ii) When the hazardous waste is generated as part of a batch process that is performed repeatedly but not necessarily continuously, the owner or operator shall:

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(A) Perform an initial waste determination of the average VO concentration for one or more representative waste batches generated by the process before the first time any portion of the material in the batches is placed in a waste management unit subject to this subpart, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(B) Perform a new waste determination whenever changes to the process generating the waste batches are reasonably likely to cause the average VO concentration of the hazardous waste to increase to a level that is equal to or greater than the applicable VO concentration limits specified in § 265.1083 of this subpart.

(3) When the facility owner and operator is not the generator of the hazardous waste, the owner or operator shall determine the average VO concentration of the hazardous waste using either their direct measurement as specified in paragraph (a)(5) of this section or knowledge of the waste as specified in paragraph (a)(6) of this section for each hazardous waste entering the facility as follows:

(i) When the hazardous waste enters the facility as a continuous flow of material through a pipeline or other means (e.g., wastewater stream), the owner or operator shall:

(A) Perform an initial waste determination of the waste stream before the first time any portion of the material in the waste stream is placed in a waste management unit subject to this subpart, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(B) Perform a new waste determination whenever changes to the source generating the waste stream are reasonably likely to cause the average VO concentration of the hazardous waste to increase to a level that is equal to or greater than the applicable VO concentration limits specified in § 265.1083 of this subpart.

(ii) When the hazardous waste enters the facility in a container, the owner or operator shall perform a waste de-

termination for the material held in each container.

(4) For the case when the average VO concentration of the hazardous waste is determined by the owner or operator to be less than 100 ppmw, but because of normal operating variations in the source or process generating the hazardous waste the VO concentration of the hazardous waste may be equal to or greater than 100 ppmw at any given time during the averaging period, the owner or operator shall prepare and enter in the facility operating record information that specifies the following:

(i) The maximum and minimum VO concentration values for the hazardous waste that occur during that averaging period used for the waste determination;

(ii) The operating conditions or circumstances under which the VO concentration of the hazardous waste will be equal to or greater than 100 ppmw; and

(iii) The information and calculations used by the owner or operator to determine the average VO concentration of the hazardous waste.

(5) Procedure for using direct measurement to determine average VO concentration of a hazardous waste at the point of waste origination.

(i) The owner or operator shall identify and record the point of waste origination for the hazardous waste. All waste samples used to determine the average VO concentration of the hazardous waste shall be collected at this point.

(ii) The owner or operator shall designate and record the averaging period to be used for determining the average VO concentration for the hazardous waste. The averaging period shall not exceed 1 year. An initial waste determination shall be performed for each averaging period.

(iii) The owner or operator shall identify each discrete quantity of the material composing the hazardous waste represented by the averaging period designated in paragraph (a)(5)(ii) of this section. An example of a discrete quantity of material composing a hazardous waste generated as part of a continuous process is the quantity of material generated during a process op-

erating mode defined by a specific set of operating conditions which are normal for the process. An example of a discrete quantity of material composed of a hazardous waste generated as part of a batch process that is performed repeatedly but not necessarily continuously is the total quantity of material composing a single batch generated by the process. An example of a discrete quantity of material composed of a hazardous waste delivered to a facility in a container is the total quantity of material held in the container.

(iv) The following procedure shall be used to measure the VO concentration for each discrete quantity of material identified in paragraph (a)(5)(ii) of this section:

(A) A sufficient number of samples, but no less than four samples, shall be collected to represent the organic composition for the entire discrete quantity of hazardous waste being tested. All of the samples shall be collected within a 1-hour period. Sufficient information shall be prepared and recorded to document the waste quantity represented by the samples and, as applicable, the operating conditions for the source or process generating the hazardous waste represented by the samples.

(B) Each sample shall be collected in accordance with the requirements specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update I, November 15, 1992 (incorporated by reference—refer to § 260.11 of this chapter).

(C) Each collected sample shall be prepared and analyzed in accordance with the requirements of Method 25D in 40 CFR part 60, appendix A.

(D) The measured VO concentration for the discrete quantity of hazardous waste shall be determined by using the results for all samples analyzed in accordance with paragraph (a)(5)(iv)(C) of this section and the following equation:

$$C = \frac{1}{n} \times \sum_{i=1}^n C_i$$

where:

C=Measured VO concentration of the discrete quantity of hazardous waste, ppmw.

i=Individual sample "i" of the hazardous waste collected in accordance with the requirements of SW-846.

n=Total number of samples of hazardous waste collected (at least 4) within a 1-hour period.

C_i=VO concentration measured by Method 25D for sample "i", ppmw.

(v) The average VO concentration of the hazardous waste shall be determined using the following procedure:

(A) When the facility owner or operator is the generator of the hazardous waste, a sufficient number of VO concentration measurements for the hazardous waste shall be performed in accordance with the requirements of paragraph (a)(5)(iv) of this section to represent the complete range of hazardous waste organic compositions and quantities that occur during the entire averaging period due to normal variations in the operating conditions for each process operating mode identified for the source or process generating the hazardous waste.

(B) When the facility owner or operator is not the generator of the hazardous waste, a sufficient number of VO concentration measurements for the hazardous waste shall be performed in accordance with the requirements of paragraph (a)(5)(iv) of this section to represent the complete range of hazardous waste organic compositions and quantities that occur in the hazardous waste as received at the facility during the entire averaging period.

(C) The average VO concentration of the hazardous waste at the point of waste origination shall be calculated by using the results for all VO measurements performed in accordance with paragraph (a)(5)(iv) of this section and the following equation:

$$C_{ave} = \frac{1}{Q_T} \times \sum_{j=1}^m (Q_j \times C_j)$$

where:

C_{ave}=Average VO concentration of the hazardous waste at the point of waste origination, ppmw.

j=Individual discrete quantity "j" of the hazardous waste for which a VO

concentration measurement is determined in accordance with the requirements of paragraph (a)(5)(iv) of this section.

m=Total number of VO concentration measurements determined in accordance with the requirements of paragraph (a)(5)(iv) of this section for the averaging period.

Q_j=Mass of the discrete quantity of the hazardous waste represented by C_j, kg.

Q_T=Total mass of the hazardous waste for the averaging period, kg.

C_j=Measured VO concentration of discrete quantity "j" for the hazardous waste determined in accordance with the requirements of paragraph (a)(5)(iv) of this section, ppmw.

(6) Procedure for using knowledge of the waste to determine the average VO concentration of a hazardous waste at the point of waste origination.

(i) The owner or operator shall identify and record the point of waste origination for the hazardous waste. All information used to determine the average VO concentration of the hazardous waste shall be based on the hazardous waste composition at this point.

(ii) The owner or operator shall designate and record the averaging period to be used for determining the average VO concentration for the hazardous waste. The averaging period shall not exceed 1 year. An initial waste determination shall be performed for each averaging period.

(iii) The owner or operator shall prepare and record sufficient information that documents the average VO concentration for the hazardous waste. Information may be used that is prepared by either the facility owner or operator or by the generator of the hazardous waste. Examples of information that may be used as the basis for knowledge of the waste include: organic material balances for the source or process generating the waste; VO concentration measurements for the same type of waste performed in accordance with the procedure specified in paragraph (a)(5)(iv) of this section; previous individual organic constituent test data for the waste that are still applicable to the current waste management practices; documentation that the waste is

generated by a process for which no organics-containing materials are used; previous test data for other locations managing the same type of waste; or other knowledge based on manifests, shipping papers, or waste certification notices.

(iv) If test data other than VO concentration measurements performed in accordance with the procedure specified in paragraph (a)(5)(iv) of this section are used as the basis for knowledge of the waste, then the owner or operator shall document the test method, sampling protocol, and the means by which sampling variability and analytical variability are accounted for in the determination of the average VO concentration. For example, an owner or operator may use individual organic constituent concentration test data that are validated in accordance with Method 301 in appendix A of 40 CFR part 63 as the basis for knowledge of the waste.

(b) Waste determination procedures for treated hazardous waste.

(1) An owner or operator shall perform the applicable waste determination for each treated hazardous waste placed in a waste management unit exempted under the provisions of § 265.1083(c)(2) of this subpart from using air emission controls in accordance with standards specified in § 265.1085 through § 265.1088 of this subpart, as applicable to the waste management unit.

(2) The owner or operator shall perform a waste determination for each discrete quantity of treated hazardous waste as follows:

(i) When the hazardous waste is treated by a continuous process, the owner or operator shall:

(A) Perform an initial waste determination for the treated waste stream before the first time any portion of the material in the waste stream is placed in a waste management unit subject to this subpart, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(B) Perform a new waste determination whenever changes to the hazardous waste streams fed to the process are reasonably likely to cause the

characteristics of the hazardous waste at the point of waste treatment to change to levels that fail to achieve the applicable conditions specified in § 265.1083(c)(2) of this subpart.

(ii) When the hazardous waste is treated by a batch process that is performed repeatedly but not necessarily continuously, the owner or operator shall:

(A) Perform an initial waste determination for the treated hazardous waste in one or more representative batches treated by the process, and thereafter update the information used for the waste determination at least once every 12 months following the date of the initial waste determination; and

(B) Perform a new waste determination whenever changes to the hazardous waste treated by the process are reasonably likely to cause the characteristics of the hazardous waste at the point of waste treatment to change to levels that fail to achieve the applicable conditions specified in § 265.1083(c)(2) of this subpart.

(3) The owner or operator shall designate and record the specific provision in § 265.1083(c)(2) of this subpart for which the waste determination is being performed. The waste determination for the treated hazardous waste shall be performed using the applicable procedures specified in paragraphs (b)(4) through (b)(10) of this section.

(4) Procedure to determine the average VO concentration of a hazardous waste at the point of waste treatment.

(i) The owner or operator shall identify and record the point of waste treatment for the hazardous waste. All waste samples used to determine the average VO concentration of the hazardous waste shall be collected at this point.

(ii) The owner or operator shall designate and record the averaging period to be used for determining the average VO concentration for the hazardous waste. The averaging period shall not exceed 1 year. An initial waste determination shall be performed for each averaging period.

(iii) The owner or operator shall identify each discrete quantity of the material composing the hazardous waste represented by the averaging period

designated in paragraph (b)(4)(ii) of this section.

(iv) The following procedure shall be used measure the VO concentration for each discrete quantity of material identified in paragraph (b)(4)(ii) of this section:

(A) A sufficient number of samples, but no less than four samples, shall be collected to represent the organic composition for the entire discrete quantity of hazardous waste being tested. All of the samples shall be collected within a 1-hour period. Sufficient information shall be prepared and recorded to document the waste quantity represented by the samples and, as applicable, the operating conditions for the process treating the hazardous waste represented by the samples.

(B) Each sample shall be collected in accordance with the requirements specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update 1, November 15, 1992 (incorporated by reference—refer to § 260.11 of this chapter).

(C) Each collected sample shall be prepared and analyzed in accordance with the requirements of Method 25D in 40 CFR part 60, appendix A.

(D) The measured VO concentration for the discrete quantity of hazardous waste shall be determined by using the results for all samples analyzed in accordance with paragraph (b)(4)(iv)(C) of this section and the following equation:

$$C = \frac{1}{n} \times \sum_{i=1}^n C_i$$

where:

C = Measured VO concentration of the discrete quantity of hazardous waste, ppmw.

i = Individual sample "i" of the hazardous waste collected in accordance with the requirements of SW-846.

n = Total number of samples of hazardous waste collected (at least 4) within a 1-hour period.

C_i = VO concentration measured by Method 25D for sample "i", ppmw.

(v) The average VO concentration of the hazardous waste at the point of

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waste treatment shall be determined using the following procedure:

(A) When the facility owner or operator is the generator of the hazardous waste, a sufficient number of VO concentration measurements for the hazardous waste shall be performed in accordance with the requirements of paragraph (b)(4)(iv) of this section to represent the complete range of hazardous waste organic compositions and quantities treated by the process during the entire averaging period.

(B) The average VO concentration of the hazardous waste at the point of waste treatment shall be calculated by using the results for all VO measurements performed in accordance with paragraph (b)(4)(iv) of this section and the following equation:

$$C_{ave} = \frac{1}{Q_T} \times \sum_{j=1}^m (Q_j \times C_j)$$

where:

C_{ave} = Average VO concentration of the hazardous waste at the point of waste treatment, ppmw.

j = Individual discrete quantity "j" of the hazardous waste for which a VO concentration measurement is determined in accordance with the requirements of paragraph (b)(4)(iv) of this section.

m = Total number of VO concentration measurements determined in accordance with the requirements of paragraph (b)(4)(iv) of this section for the averaging period.

Q_j = Mass of the discrete quantity of the hazardous waste represented by C_j, kg.

Q_T = Total mass of the hazardous waste for the averaging period, kg.

C_j = Measured VO concentration of discrete quantity "j" for the hazardous waste determined in accordance with the requirements of paragraph (b)(4)(iv) of this section, ppmw.

(5) Procedure to determine the exit concentration limit (C_i) for a treated hazardous waste.

(i) The point of waste origination for each hazardous waste treated by the process at the same time shall be identified.

(ii) If a single hazardous waste stream is identified in paragraph (b)(5)(i) of this section, then the exit concentration limit (C_i) shall be 100 ppmw.

(iii) If more than one hazardous waste stream is identified in paragraph (b)(5)(i) of this section, then the VO concentration of each hazardous waste stream at the point of waste origination shall be determined in accordance with the requirements of paragraph (a) of this section. The exit concentration limit (C_i) shall be calculated by using the results determined for each individual hazardous waste stream and the following equation:

$$C_i = \frac{\sum_{x=1}^m (Q_x \times \bar{C}_x) + \sum_{y=1}^n (Q_y \times 100 \text{ ppmw})}{\sum_{x=1}^m Q_x + \sum_{y=1}^n Q_y}$$

where:

C_i = Exit concentration limit for treated hazardous waste, ppmw.

x = Individual hazardous waste stream "x" that has a VO concentration less than 100 ppmw at the point of waste origination as determined in accordance with the requirements of § 265.1084(a).

y = Individual hazardous waste stream "y" that has a VO concentration equal to or greater than 100 ppmw at the point of waste origination as determined in accordance with the requirements of § 265.1084(a).

m = Total number of "x" hazardous waste streams treated by process.

n = Total number of "y" hazardous waste streams treated by process.

Q_x = Annual mass quantity of hazardous waste stream "x", kg/yr.

Q_y = Annual mass quantity of hazardous waste stream "y", kg/yr.

$\bar{C}_x$ = Average VO concentration of hazardous waste stream "x" at the point of waste origination as determined in accordance with the requirements of § 265.1084(a), ppmw.

(6) Procedure to determine the organic reduction efficiency (R) for a treated hazardous waste.

(i) The organic reduction efficiency for a treatment process shall be determined based on results for a minimum

of three consecutive runs. The sampling time for each run shall be 1 hour.

(ii) The point of each hazardous waste stream entering the process and each hazardous waste stream exiting the process that is to be included in the calculation of the organic reduction efficiency for the process shall be identified.

(iii) For each run, the following information shall be determined for each hazardous waste stream identified in paragraph (b)(6)(ii) of this section using the following procedures:

(A) The mass quantity of each hazardous waste stream entering the process (Q_{ej}) and the mass quantity of each hazardous waste stream exiting the process (Q_{ex}) shall be determined.

(B) The VO concentration of each hazardous waste stream entering the process (C_{ej}) during the run shall be measured in accordance with the requirements of paragraphs (a)(5)(iv)(A) through (a)(5)(iv)(D) of this section. The VO concentration of each hazardous waste stream exiting the process (C_{ex}) during the run shall be determined in accordance with the requirements of paragraph (b)(4)(iv) of this section. Samples shall be collected as follows:

(1) For a continuous process, the samples of the hazardous waste entering and samples of the hazardous waste exiting the process shall be collected concurrently.

(2) For a batch process, the samples of the hazardous waste entering the process shall be collected at the time that the hazardous waste is placed in the process. The samples of the hazardous waste exiting the process shall be collected as soon as practicable after the time when the process stops operation or the final treatment cycle ends.

(iv) The waste volatile organic mass flow entering the process (E_{ej}) and the waste volatile organic mass flow exiting the process (E_{ex}) shall be calculated by using the results determined in accordance with paragraph (b)(6)(iii) of this section and the following equations:

$$E_{ej} = \frac{1}{10^6} \sum_{j=1}^m (Q_{ej} \times C_{ej})$$

$$E_{ex} = \frac{1}{10^6} \sum_{j=1}^m (Q_{ex} \times C_{ex})$$

where:

E_{ej} = Waste volatile organic mass flow entering process, kg/hr.

E_{ex} = Waste volatile organic mass flow exiting process, kg/hr.

m = Total number of runs (at least 3)

j = Individual run "j"

Q_{ej} = Mass quantity of hazardous waste entering process during run "j", kg/hr.

Q_{ex} = Average mass quantity of waste exiting process during run "j", kg/hr.

C_{ej} = Measured VO concentration of hazardous waste entering process during run "j" as determined in accordance with the requirements of § 265.1084(b)(4)(iv), ppmw.

C_{ex} = Measured VO concentration of hazardous waste exiting process during run "j" as determined in accordance with the requirements of § 265.1084 (a)(5)(iv)(A) through (a)(5)(iv)(D), ppmw.

(v) The organic reduction efficiency of the process shall be calculated by using the results determined in accordance with paragraph (b)(6)(iv) of this section and the following equation:

$$R = \frac{E_{ej} - E_{ex}}{E_{ej}} \times 100\%$$

where:

R = Organic reduction efficiency, percent.

E_{ej} = Waste volatile organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(6)(iv) of this section, kg/hr.

E_{ex} = Waste volatile organic mass flow exiting process as determined in accordance with the requirements of paragraph (b)(6)(iv) of this section, kg/hr.

(7) Procedure to determine the organic biodegradation efficiency (R_{bio}) for a treated hazardous waste.

(i) The fraction of organics biodegraded (F_{bio}) shall be determined using the procedure specified in 40 CFR part 63, appendix C of this chapter.

(ii) The organic biodegradation efficiency shall be calculated by using the following equation:

$$R_{bio} = F_{bio} \times 100\%$$

where:

R_{bio} = Organic biodegradation efficiency, percent.

F_{bio} = Fraction of organic biodegraded as determined in accordance with the requirements of paragraph (b)(7)(i) of this section.

(8) Procedure to determine the required organic mass removal rate (RMR) for a treated hazardous waste.

(i) The point of waste origination for each hazardous waste treated by the process at the same time shall be identified.

(ii) For each hazardous waste stream identified in paragraph (b)(8)(i) of this section, the VO concentration of the hazardous waste stream at the point of waste origination shall be determined in accordance with the requirements of paragraph (a) of this section.

(iii) For each individual hazardous waste stream that has a volatile organic concentration equal to or greater than 100 ppmw at the point of waste origination as determined in accordance with the requirements of paragraph (b)(8)(ii) of this section, the average volumetric flow rate of hazardous waste at the point of waste origination and the density of the hazardous waste stream shall be determined.

(iv) The required organic mass removal rate for the hazardous waste shall be calculated by using the results determined for each individual hazardous waste stream in accordance with the requirements of paragraphs (b)(8)(ii) and (b)(8)(iii) of this section and the following equation:

$$RMR = \sum_{j=1}^n \left[V_j \times k_j \times \frac{(C_j - 100 \text{ ppmw})}{10^6} \right]$$

where:

RMR = Required organic mass removal rate, kg/hr.

y = Individual hazardous waste stream "y" that has a volatile organic concentration equal to or greater than 100 ppmw at the point of waste origination as determined in accordance with the requirements of § 265.1084(a).

n = Total number of "y" hazardous waste streams treated by process.

V_j = Average volumetric flow rate of hazardous waste stream "y" at the point of waste origination, m³/hr.

k_j = Density of hazardous waste stream "y", kg/m³.

C_j = Average VO concentration of hazardous waste stream "y" at the point of waste origination as determined in accordance with the requirements of § 265.1084(a), ppmw.

(9) Procedure to determine the actual organic mass removal rate (MR) for a treated hazardous waste.

(i) The actual organic mass removal rate shall be determined based on results for a minimum of three consecutive runs. The sampling time for each run shall be 1 hour.

(ii) The waste volatile organic mass flow entering the process (E_{ej}) and the waste volatile organic mass flow exiting the process (E_{ex}) shall be determined in accordance with the requirements of paragraph (b)(9)(i) of this section and the following equation:

(iii) The actual organic mass removal rate shall be calculated by using the results determined in accordance with the requirements of paragraph (b)(9)(ii) of this section and the following equation:

$$MR = E_{ej} - E_{ex}$$

where:

MR = Actual organic mass removal rate, kg/hr.

E_{ej} = Waste volatile organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(9)(iv) of this section, kg/hr.

E_{ex} = Waste volatile organic mass flow exiting process as determined in accordance with the requirements of paragraph (b)(9)(iv) of this section, kg/hr.

(10) Procedure to determine the actual organic mass biodegradation rate (MR_{bio}) for a treated hazardous waste.

(i) The actual organic mass biodegradation rate shall be determined based on results for a minimum of three consecutive runs. The sampling time for each run shall be 1 hour.

(ii) The waste organic mass flow entering the process (E_o) shall be determined in accordance with the requirements of paragraph (b)(6)(iv) of this section.

(iii) The fraction of organic biodegraded (F_{bw}) shall be determined using the procedure specified in 40 CFR part 63, appendix C.

(iv) The actual organic mass biodegradation rate shall be calculated by using the mass flow rates and fraction of organic biodegraded determined in accordance with the requirements of paragraphs (b)(10)(ii) and (b)(10)(iii) of this section and the following equation:

$$MR_{bw} = E_o \times F_{bw}$$

where:

MR_{bw} = Actual organic mass biodegradation rate, kg/hr.

E_o = Waste organic mass flow entering process as determined in accordance with the requirements of paragraph (b)(6)(iv) of this section, kg/hr.

F_{bw} = Fraction of organic biodegraded as determined in accordance with the requirements of paragraph (b)(10)(iii) of this section.

(c) Procedure to determine the maximum organic vapor pressure of a hazardous waste in a tank.

(1) An owner or operator shall determine the maximum organic vapor pressure for each hazardous waste placed in a tank using air emission controls in accordance with standards specified in § 265.1085(c) of this subpart.

(2) An owner or operator shall use either direct measurement as specified in paragraph (c)(3) of this section or knowledge of the waste as specified by paragraph (c)(4) of this section to determine the maximum organic vapor pressure which is representative of the hazardous waste composition stored or treated in the tank.

(3) To determine the maximum organic vapor pressure of the hazardous waste by direct measurement, the following procedure shall be used:

(i) Representative samples of the waste contained in the tank shall be

collected. Sampling shall be conducted in accordance with the requirements specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication No. SW-846, Third Edition, September 1986, as amended by Update 1, November 1992 (incorporated by reference—refer to § 260.11 of this chapter).

(ii) Any appropriate one of the following methods may be used to analyze the samples and compute the maximum organic vapor pressure:

(A) Method 25E in 40 CFR part 60, appendix A;

(B) Methods described in American Petroleum Institute Publication 2517, Third Edition, February 1989, "Evaporative Loss from External Floating Roof Tanks," (incorporated by reference—refer to § 260.11 of this chapter);

(C) Methods obtained from standard reference texts;

(D) ASTM Method 2879-92 (incorporated by reference—refer to § 260.11 of this chapter); or

(E) Any other method approved by the Regional Administrator.

(4) To determine the maximum organic vapor pressure of the hazardous waste by knowledge, sufficient information shall be prepared and recorded that documents the maximum organic vapor pressure of the hazardous waste in the tank. Examples of information that may be used include: documentation that the waste is generated by a process for which no organics-containing materials are used; or that the waste is generated by a process for which at other locations it previously has been determined by direct measurement that the waste maximum organic vapor pressure is less than the maximum vapor pressure limit for the appropriate design capacity category specified for the tank.

§ 265.1085 Standards: Tanks.

(a) This section applies to owners and operators of tanks subject to this subpart into which any hazardous waste is placed except for the following tanks:

(1) A tank in which all hazardous waste entering the tank meets the conditions specified in § 265.1083(c) of this subpart; or

(2) A tank used for biological treatment of hazardous waste in accordance

with the requirements of § 265.1083(c)(2)(iv) of this subpart.

(b) The owner or operator shall place the hazardous waste into one of the following tanks:

(i) A tank equipped with a cover (e.g., a fixed roof) that is vented through a closed-vent system to a control device in accordance with the requirements specified in paragraph (d) of this section;

(2) A tank equipped with a fixed roof and internal floating roof in accordance with the requirements of § 265.1091 of this subpart;

(3) A tank equipped with an external floating roof in accordance with the requirements of § 265.1091 of this subpart; or

(4) A pressure tank that is designed to operate as a closed system such that the tank operates with no detectable organic emissions at all times that hazardous waste is in the tank except as provided for in paragraph (g) of this section.

(c) As an alternative to complying with paragraph (b) of this section, an owner or operator may place hazardous waste in a tank equipped with a cover (e.g., a fixed roof) meeting the requirements specified in paragraph (d)(1) of this section when the hazardous waste is determined to meet all of the following conditions:

(1) The hazardous waste is neither mixed, stirred, agitated, nor circulated within the tank by the owner or operator using a process that results in splashing, frothing, or visible turbulent flow on the waste surface during normal process operations;

(2) The hazardous waste in the tank is not heated by the owner or operator except during conditions requiring that the waste be heated to prevent the waste from freezing or to maintain adequate waste flow conditions for continuing normal process operations;

(3) The hazardous waste in the tank is not treated by the owner or operator using a waste stabilization process or a process that produces an exothermic reaction; and

(4) The maximum organic vapor pressure of the hazardous waste in the tank as determined using the procedure specified in § 265.1084(c) of this subpart

is less than the following applicable value:

(i) If the tank design capacity is equal to or greater than 151 m³, then the maximum organic vapor pressure shall be less than 5.2 kPa;

(ii) If the tank design capacity is equal to or greater than 75 m³ but less than 151 m³, then the maximum organic vapor pressure shall be less than 27.6 kPa; or

(iii) If the tank design capacity is less than 75 m³, then the maximum organic vapor pressure shall be less than 76.6 kPa.

(d) To comply with paragraph (b)(1) of this section, the owner or operator shall design, install, operate, and maintain a cover that vents the organic vapors emitted from hazardous waste in the tank through a closed-vent system connected to a control device.

(1) The cover shall be designed and operated to meet the following requirements:

(i) The cover and all cover openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable organic emissions when all cover openings are secured in a closed, sealed position.

(ii) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the tank except as provided for in paragraph (f) of this section.

(2) The closed-vent system and control device shall be designed and operated in accordance with the requirements of § 265.1088 of this subpart.

(e) The owner and operator shall install, operate, and maintain enclosed pipes or other closed systems for the transfer of hazardous waste as described in paragraph (e)(1) or (e)(2) of this section. The EPA considers a drain system that meets the requirements of 40 CFR 61.346(a)(1) or 40 CFR 61.346(b)(1) through (b)(3) to be a closed system.

(1) Transfer all hazardous waste to the tank from another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in § 265.1083(c) of this subpart; and

(2) Transfer all hazardous waste from the tank to another tank, surface impoundment, or container subject to

this subpart except for those hazardous wastes that meet the conditions specified in §265.1083(c) of this subpart.

(f) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid) at all times that hazardous waste is in the tank except when it is necessary to use the cover opening to:

- (1) Add, remove, inspect, or sample the material in the tank;
- (2) Inspect, maintain, repair, or replace equipment located inside the tank; or
- (3) Vent gases or vapors from the tank to a closed-vent system connected to a control device that is designed and operated in accordance with the requirements of §265.1088 of this subpart.

(g) One or more safety devices which vent directly to the atmosphere may be used on the tank, cover, closed-vent system, or control device provided each safety device meets all of the following conditions:

- (1) The safety device is not used for planned or routine venting of organic vapors from the tank or the closed-vent system connected to a control device; and
- (2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the tank, cover, closed-vent system, or control device in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an unplanned event is a sudden power outage.

§265.1086 Standards: Surface impoundments.

(a) This section applies to owners and operators of surface impoundments subject to this subpart into which any hazardous waste is placed except for the following surface impoundments:

- (1) A surface impoundment in which all hazardous waste entering the surface impoundment meets the conditions specified in §265.1083(c) of this subpart; or
- (2) A surface impoundment used for biological treatment of hazardous waste in accordance with the require-

ments of §265.1083(c)(2)(iv) of this subpart.

(b) The owner or operator shall place the hazardous waste into a surface impoundment equipped with a cover (e.g., an air-supported structure or a rigid cover) that is vented through a closed-vent system to a control device meeting the requirements specified in paragraph (d) of this section.

(c) As an alternative to complying with paragraph (b) of this section, an owner or operator may place hazardous waste in a surface impoundment equipped with a floating membrane cover meeting the requirements specified in paragraph (e) of this section when the hazardous waste is determined to meet all of the following conditions:

- (1) The hazardous waste is neither mixed, stirred, agitated, nor circulated within the surface impoundment by the owner or operator using a process that results in splashing, frothing, or visible turbulent flow on the waste surface during normal process operations;
- (2) The hazardous waste in the surface impoundment is not heated by the owner or operator; and
- (3) The hazardous waste in the surface impoundment is not treated by the owner or operator using a waste stabilization process or a process that produces an exothermic reaction.

(d) To comply with paragraph (b)(1) of this section, the owner or operator shall design, install, operate, and maintain a cover that vents the organic vapors emitted from hazardous waste in the surface impoundment through a closed-vent system connected to a control device.

(1) The cover shall be designed, installed, operated, and maintained to meet the following requirements:

- (i) The cover and all cover openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable organic emissions when all cover openings are secured in a closed, sealed position.

(ii) Each cover opening shall be secured in the closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the surface impoundment except as provided for in paragraph (g) of this section.

(iii) The closed-vent system and control device shall be designed and operated in accordance with §265.1088 of this subpart.

(e) To comply with paragraph (c) of this section, the owner or operator shall design, install, operate, and maintain a floating membrane cover that meets all of the following requirements:

- (1) The floating membrane cover shall be designed, installed, and operated such that at all times when hazardous waste is in the surface impoundment, the entire surface area of the hazardous waste is enclosed by the cover, and any air spaces underneath the cover are not vented to the atmosphere except during conditions specified in paragraph (h) of this section.
- (2) The floating membrane cover and all cover openings (e.g., access hatches, sampling ports, and gauge wells) shall be designed to operate with no detectable organic emissions when all cover openings are secured in a closed, sealed position.

(3) Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the surface impoundment except as provided for in paragraphs (g)(1) through (g)(3) of this section; and

(4) The synthetic membrane material used for the floating membrane cover shall be either:

- (i) High density polyethylene with a thickness no less than 2.5 mm; or
- (ii) A material or a composite of different materials determined to have the following properties:

(A) Organic permeability properties that are equivalent to those of the material specified in paragraph (e)(4)(i) of this section; and

(B) Chemical and physical properties that maintain the material integrity for as long as the cover is in use. Factors that shall be considered in selecting the material include: the effects of contact with the waste managed in the impoundment, weather exposure, and cover installation and operation practices.

(f) The owner or operator shall install, operate, and maintain enclosed pipes or other closed systems for the transfer of hazardous waste as de-

scribed in paragraph (f)(1) or (f)(2) of this section. The EPA considers a drain system that meets the requirements of 40 CFR 61.346(a)(1) or 40 CFR 61.346(b)(1) through (b)(3) to be a closed system.

(1) Transfer all hazardous waste to the surface impoundment from another tank, surface impoundment, or container subject to this subpart except for those hazardous wastes that meet the conditions specified in §265.1083(c) of this subpart.

(g) Each cover opening shall be secured in the closed, sealed position (e.g., covered by a gasketed lid or cap) at all times that hazardous waste is in the surface impoundment except when it is necessary to use the cover opening to:

- (1) Add, remove, inspect, or sample the material in the surface impoundment;
- (2) Inspect, maintain, repair, or replace equipment located underneath the cover;
- (3) Remove treatment residues from the surface impoundment in accordance with the requirements of 40 CFR 268.4; or
- (4) Vent gases or vapors from the surface impoundment to a closed-vent system designed and operated in accordance with the requirements of §265.1088 of this subpart.

(h) One or more safety devices that vent directly to the atmosphere may be installed on the cover, closed-vent system, or control device provided each device meets all of the following conditions:

- (1) The safety device is not used for planned or routine venting of organic vapors from the surface impoundment or the closed-vent system connected to a control device; and
- (2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the cover, closed-

vent system, or control device in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an unplanned event is a sudden power outage.

§ 265.1087 Standards: Containers.

(a) This section applies to the owners and operators of containers having design capacities greater than 0.1 m³ subject to this subpart into which any hazardous waste is placed except for a container in which all hazardous waste entering the container meets the conditions specified in § 265.1083(c) of this subpart.

(b) An owner or operator shall manage hazardous waste in containers using the following procedures:

(1) The owner or operator shall place the hazardous waste into one of the following containers except when a container is used for hazardous waste treatment as required by paragraph (b)(2) of this section:

(i) A container that is equipped with a cover which operates with no detectable organic emissions when all container openings (e.g., lids, bungs, hatches, and sampling ports) are secured in a closed, sealed position. The owner or operator shall determine that a container operates with no detectable emissions by testing each opening on the container for leaks in accordance with Method 21 in 40 CFR part 60, appendix A the first time any portion of the hazardous waste is placed into the container. If a leak is detected and cannot be repaired immediately, the hazardous waste shall be removed from the container and the container not used to meet the requirements of this paragraph until the leak is repaired and the container is retested.

(ii) A container having a design capacity less than or equal to 0.46 m³ that is equipped with a cover and complies with all applicable Department of Transportation regulations on packaging hazardous waste for transport under 49 CFR part 178.

(A) A container that is managed in accordance with the requirements of 49 CFR part 178 for the purpose of complying with this subpart is not subject to any exceptions to the 49 CFR part 178

regulations, except as noted in paragraph (b)(1)(i)(B) of this section.

(B) A lab pack that is managed in accordance with the requirements of 49 CFR part 178 for the purpose of complying with this subpart may comply with the exceptions for combination packagings specified in 49 CFR 173.12(b).

(iii) A container that is attached to or forms a part of any truck, trailer, or railcar; and that has been demonstrated within the preceding 12 months to be organic vapor tight when all container openings are in a closed, sealed position (e.g., the container hatches or lids are gasketed and latched). For the purpose of meeting the requirements of this paragraph, a container is organic vapor tight if the container sustains a pressure change of not more than 750 pascals within 5 minutes after it is pressurized to a minimum of 4,500 pascals. This condition is to be demonstrated using the pressure test specified in Method 27 of 40 CFR part 60, appendix A, and a pressure measurement device which has a precision of ± 2.5 mm water and which is capable of measuring above the pressure at which the container is to be tested for vapor tightness.

(2) An owner or operator treating hazardous waste in a container by either a waste stabilization process, any process that requires the addition of heat to the waste, or any process that produces an exothermic reaction shall meet the following requirements:

(i) Whenever it is necessary for the container to be open during the treatment process, the container shall be located inside an enclosure that is vented through a closed-vent system to a control device.

(ii) The enclosure shall be a structure that is designed and operated in accordance with the following requirements:

(A) The enclosure shall be a structure that is designed and operated with sufficient airflow into the structure to capture the organic vapors emitted from the hazardous waste in the container and vent the vapors through the closed-vent system to the control device.

(B) The enclosure may have permanent or temporary openings to allow

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cated at a distance equal to or less than 15.25 cm from the container bottom.

(ii) Hazardous waste transferred by a means other than pumping shall be performed such that during transfer of the waste into the container, the cover remains in place and all container openings are maintained in a closed, sealed position except for those openings through which the hazardous waste is added and as provided for in paragraph (d) of this section.

(c) Each container opening shall be maintained in a closed, sealed position (e.g., covered by a gasketed lid) at all times that hazardous waste is in the container except when it is necessary to use the opening to:

(1) Add, remove, inspect, or sample the material in the container;

(2) Inspect, maintain, repair, or replace equipment located inside the container; or

(3) Vent gases or vapors from a cover located over or enclosing an open container to a closed-vent system connected to a control device that is designed and operated in accordance with the requirements of § 265.1088 of this subpart.

(d) One or more safety devices that vent directly to the atmosphere may be used on the container, cover, enclosure, closed-vent system, or control device provided each device meets all of the following conditions:

(1) The safety device is not used for planned or routine venting of organic vapors from the container, cover, enclosure, or closed-vent system connected to a control device; and

(2) The safety device remains in a closed, sealed position at all times except when an unplanned event requires that the device open for the purpose of preventing physical damage or permanent deformation of the container, cover, enclosure, closed-vent system, or control device in accordance with good engineering and safety practices for handling flammable, combustible, explosive, or other hazardous materials. An example of an unplanned event is a sudden power outage.

worker access; passage of containers through the enclosure by conveyor or other mechanical means; entry of permanent mechanical or electrical equipment; or to direct airflow into the enclosure. The pressure drop across each opening in the enclosure shall be maintained at a pressure below atmospheric pressure such that whenever an open container is placed inside the enclosure no organic vapors released from the container exit the enclosure through the opening. The owner or operator shall determine that an enclosure achieves this condition by measuring the pressure drop across each opening in the enclosure. If the pressure within the enclosure is equal to or greater than atmospheric pressure then the enclosure does not meet the requirements of this section.

(iii) The closed-vent system and control device shall be designed and operated in accordance with the requirements of § 265.1088 of this subpart.

(3) An owner or operator transferring hazardous waste into a container having a design capacity greater than 0.46 m³ shall meet the following requirements:

(i) Hazardous waste transfer by pumping shall be performed using a conveyance system that uses a tube (e.g., pipe, hose) to add the waste into the container. During transfer of the waste into the container, the cover shall remain in place and all container openings shall be maintained in a closed, sealed position except for those openings through which the tube enters the container and as provided for in paragraph (c) of this section. The tube shall be positioned in a manner such that either the:

(A) Tube outlet continuously remains submerged below the waste surface at all times waste is flowing through the tube;

(B) Lower bottom edge of the tube outlet is located at a distance no greater than two inside diameters of the tube or 15.25 cm, whichever distance is greater, from the bottom of the container at all times waste is flowing through the tube; or

(C) Tube is connected to a permanent port mounted on the bottom of the container so that the lower edge of the port opening inside the container is lo-

§ 265.1088 Standards: Closed-vent systems and control devices.

(a) This section applies to each closed-vent system and control device installed and operated by the owner or operator to control air emissions in accordance with standards of this subpart.

(b) The closed-vent system shall meet the following requirements:

(1) The closed-vent system shall route the gases, vapors, and fumes emitted from the hazardous waste in the waste management unit to a control device that meets the requirements specified in paragraph (c) of this section.

(2) The closed-vent system shall be designed and operated in accordance with the requirements specified in § 265.1033(f) of this part.

(3) If the closed-vent system contains one or more bypass devices that could be used to divert all or a portion of the gases, vapors, or fumes from entering the control device, the owner or operator shall meet the following requirements:

(i) For each bypass device except as provided for in paragraph (b)(3)(ii) of this section, the owner or operator shall either:

(A) Install, calibrate, maintain, and operate a flow indicator at the inlet to the bypass device that indicates at least once every 15 minutes whether gas, vapor, or fume flow is present in the bypass device; or

(B) Secure the valve installed at the inlet to the bypass device in the closed position using a car-seal or a lock-and-key type configuration. The owner or operator shall visually inspect the seal or closure mechanism at least once every month to verify that the valve is maintained in the closed position.

(ii) Low leg drains, high point bleeds, analyzer vents, open-ended valves or lines, and safety devices are not subject to the requirements of paragraph (b)(3)(i) of this section.

(c) The control device shall meet the following requirements:

(1) The control device shall be one of the following devices:

(i) A control device designed and operated to reduce the total organic content of the inlet vapor stream vented

to the control device by at least 95 percent by weight;

(ii) An enclosed combustion device designed and operated in accordance with the requirements of § 265.1033(c); or

(iii) A flare designed and operated in accordance with the requirements of § 265.1033(d).

(2) The control device shall be operating at all times when gases, vapors, or fumes are vented from the waste management unit through the closed-vent system to the control device.

(3) The owner or operator using a carbon adsorption system to comply with paragraph (c)(1) of this section shall operate and maintain the control device in accordance with the following requirements:

(i) Following the initial startup of the control device, all activated carbon in the control device shall be replaced with fresh carbon on a regular basis in accordance with the requirements of § 265.1033(g) or § 265.1033(h).

(ii) All carbon removed from the control device shall be managed in accordance with the requirements of § 265.1033(i).

(4) An owner or operator using a control device other than a thermal vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with paragraph (c)(1) of this section shall operate and maintain the control device in accordance with the requirements of § 265.1033(i).

(5) The owner or operator shall demonstrate that a control device achieves the performance requirements of paragraph (c)(1) of this section as follows:

(i) An owner or operator shall demonstrate using either a performance test as specified in paragraph (c)(5)(iii) of this section or a design analysis as specified in paragraph (c)(5)(iv) of this section the performance of each control device except for the following:

(A) A flare;

(B) A boiler or process heater with a design heat input capacity of 44 megawatts or greater;

(C) A boiler or process heater into which the vent stream is introduced with the primary fuel;

(D) A boiler or process heater burning hazardous waste for which the owner or operator has been issued a

final permit under 40 CFR part 270 and designs and operates the unit in accordance with the requirements of 40 CFR part 266, subpart H; or

(E) A boiler or process heater burning hazardous waste for which the owner or operator has certified compliance with the interim status requirements of 40 CFR part 266, subpart H.

(ii) An owner or operator shall demonstrate the performance of each flare in accordance with the requirements specified in § 265.1033(e).

(iii) For a performance test conducted to meet the requirements of paragraph (c)(5)(i) of this section, the owner or operator shall use the test methods and procedures specified in § 265.1033(c)(1) through (c)(4).

(iv) For a design analysis conducted to meet the requirements of paragraph (c)(5)(i) of this section, the design analysis shall meet the requirements specified in § 265.1033(b)(4)(iii).

(v) The owner or operator shall demonstrate that a carbon adsorption system achieves the performance requirements of paragraph (c)(1) of this section based on the total quantity of organics vented to the atmosphere from all carbon adsorption system equipment that is used for organic adsorption, organic desorption or carbon regeneration, organic recovery, and carbon disposal.

(6) If the owner or operator and the Regional Administrator do not agree on a demonstration of control device performance using a design analysis then the disagreement shall be resolved using the results of a performance test performed by the owner or operator in accordance with the requirements of paragraph (c)(5)(iii) of this section. The Regional Administrator may choose to have an authorized representative observe the performance test.

§ 265.1089 Inspection and monitoring requirements.

(a) This section applies to an owner or operator using air emission controls in accordance with the requirements of § 265.1085 through § 265.1088 of this subpart.

(b) Each cover used in accordance with requirements of § 265.1085 through § 265.1087 of this subpart shall be visually inspected and monitored for de-

tectable organic emissions by the owner or operator using the procedure specified in paragraph (f) of this section except as follows:

(1) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in paragraph (f) of this section for the following tank covers:

(i) A tank internal floating roof that is inspected and monitored in accordance with the requirements of § 265.1091 of this subpart; or

(ii) A tank external floating roof that is inspected and monitored in accordance with the requirements of § 265.1091 of this subpart.

(2) If a tank is buried partially or entirely underground, an owner or operator is required to perform the cover inspection and monitoring requirements specified in paragraph (f) of this section only for those portions of the tank cover and those connections to the tank cover or tank body (e.g. fill ports, access hatches, gauge wells, etc.) that extend to or above the ground surface and can be opened to the atmosphere.

(3) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in paragraph (f) of this section for a container that meets all requirements specified in either § 265.1087(b)(1)(i) or § 265.1087(b)(1)(ii) of this subpart.

(4) An owner or operator is exempted from performing the cover inspection and monitoring requirements specified in paragraph (f) of this section for an enclosure used to control air emissions from containers in accordance with the requirements of § 265.1087(b)(2) of this subpart.

(c) Each closed-vent system used in accordance with the requirements of § 265.1088 of this subpart shall be inspected and monitored by the owner or operator in accordance with the procedure specified in § 265.1033(j).

(d) Each control device used in accordance with the requirements of § 265.1088 of this subpart shall be inspected and monitored by the owner or operator in accordance with the procedure specified in § 265.1033(k).

(e) The owner or operator shall develop and implement a written plan and schedule to perform all inspection and monitoring requirements of this

section. The owner or operator shall incorporate this plan and schedule into the facility inspection plan required under 40 CFR 265.15.

(f) Inspection and monitoring of a cover in accordance with the requirements of paragraph (b) of this section shall be performed as follows:

(1) The cover and all cover openings shall be initially visually inspected and monitored for detectable organic emissions on or before the date that the tank, surface impoundment, or container using the cover becomes subject to the provisions of this subpart and at other times as requested by the Regional Administrator.

(2) At least once every 6 months following the initial visual inspection and monitoring for detectable organic emissions required under paragraph (f)(1) of this section, the owner and operator shall visually inspect and monitor the cover and each cover opening except for following cover openings:

(i) A cover opening that has continuously remained in a closed, sealed position for the entire period since the last time the cover opening was visually inspected and monitored for detectable emissions;

(ii) A cover opening that is designated as unsafe to inspect and monitor in accordance with paragraph (X)(5) of this section;

(iii) A cover opening on a cover installed and placed in operation before December 6, 1994, that is designated as difficult to inspect and monitor in accordance with paragraph (X)(6) of this section.

(3) To visually inspect a cover, the owner or operator shall view the entire cover surface and each cover opening in a closed, sealed position for evidence of any defect that may affect the ability of the cover or cover opening to continue to operate with no detectable organic emissions. A visible hole, gap, tear, or split in the cover surface or a cover opening is defined as a leak which shall be repaired in accordance with paragraph (X)(7) of this section.

(4) To monitor a cover for detectable organic emissions, the owner or operator shall use the following procedure:

(i) Method 21 in 40 CFR part 60, appendix A to test each cover seal and cover connection for detectable organic

emissions. Seals on floating membrane covers shall be monitored around the entire perimeter of the cover at locations spaced no greater than 3 meters apart.

(ii) For all cover connections and seals except for the seals around a rotating shaft that passes through a cover opening, if the monitoring instrument indicates detectable organic emissions (i.e., an instrument concentration reading greater than 500 ppmv plus the background level), then a leak is detected. Each detected leak shall be repaired in accordance with paragraph (X)(7) of this section.

(iii) For the seals around a rotating shaft that passes through a cover opening, if the monitoring instrument indicates a concentration reading greater than 10,000 ppmv, then a leak is detected. Each detected leak shall be repaired in accordance with paragraph (X)(7) of this section.

(5) An owner or operator may designate a cover as an unsafe to inspect and monitor cover if all of the following conditions are met:

(i) The owner or operator determines that inspection or monitoring of the cover would expose a worker to dangerous, hazardous, or other unsafe conditions.

(ii) The owner or operator develops and implements a written plan and schedule to inspect the cover using the procedure specified in paragraph (X)(3) of this section and monitor the cover using the procedure specified in paragraph (f)(4) of this section as frequently as practicable during those times when a worker can safely access the cover.

(6) An owner or operator may designate a cover installed and placed in operation before December 6, 1994, as a difficult to inspect and monitor cover if all of the following conditions are met:

(i) The owner or operator determines that inspection or monitoring the cover requires elevating a worker to a height greater than 2 meters above a support surface; and

(ii) The owner and operator develops and implements a written plan and schedule to inspect the cover using the procedure specified in paragraph (X)(3) of this section, and to monitor the cover using the procedure specified in

paragraph (X)(4) of this section at least once per calendar year.

(7) When a leak is detected by either of the methods specified in paragraph (f)(3) or (f)(4) of this section, the owner or operator shall repair the leak in the following manner:

(i) The owner or operator shall make a first attempt at repairing the leak no later than 5 calendar days after the leak is detected. Repair of the leak shall be completed as soon as practicable, but no later than 15 calendar days after the leak is detected. If repair of the leak cannot be completed within the 15-day period, except as provided in paragraph (X)(7)(ii) of this section, then the owner or operator shall not add hazardous waste to the tank, surface impoundment, or container on which the cover is installed until the repair of the leak is completed.

(ii) Repair of a leak detected on a cover installed on a tank or surface impoundment may be delayed beyond 15 calendar days if the owner or operator determines that both of the following conditions occur:

(A) Repair of the leak requires first emptying the contents of the tank or surface impoundment; and

(B) Temporary removal of the tank or surface impoundment from service will result in the unscheduled cessation of production from the process unit or operation of the waste management unit that is generating the hazardous waste managed in the tank or surface impoundment.

(iii) Repair of a leak determined by the owner or operator to meet the conditions specified in paragraph (X)(7)(ii) of this section shall be performed at the next time the process, system, or waste management unit that is generating the hazardous waste managed in the tank or surface impoundment stops operation for any reason.

§ 265.1090 Recordkeeping requirements.

(a) Each owner or operator of a facility subject to requirements in this subpart shall record and maintain the following information as applicable:

(1) Documentation for each cover installed on a tank in accordance with the requirements of § 265.1085(b)(2) or § 265.1085(b)(3) of this subpart that in-

cludes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the applicable design specifications as listed in § 265.1091(c) of this subpart.

(2) Documentation for each floating membrane cover installed on a surface impoundment in accordance with the requirements of § 265.1086(c) of this subpart that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the specifications listed in § 265.1086(e) of this subpart.

(3) Documentation for each enclosure used to control air emissions from containers in accordance with the requirements of § 265.1087(b)(2)(i) of this subpart that includes information prepared by the owner or operator or provided by the manufacturer or vendor describing the enclosure design, and certification by the owner or operator that the enclosure meets the specifications listed in § 265.1087(b)(2)(ii) of this subpart.

(4) Documentation for each closed-vent system and control device installed in accordance with the requirements of § 265.1088 of this subpart that includes:

(i) Certification that is signed and dated by the owner or operator stating that the control device is designed to operate at the performance level documented by a design analysis as specified in paragraph (a)(4)(ii) of this section or by performance tests as specified in paragraph (a)(4)(iii) of this section when the tank, surface impoundment, or container is or would be operating at capacity or the highest level reasonably expected to occur.

(ii) If a design analysis is used, then design documentation as specified in § 265.1035(b)(4). The documentation shall include information prepared by the owner or operator or provided by the control device manufacturer or vendor that describes the control device design in accordance with § 265.1035(b)(4)(iii) and certification by the owner or operator that the control

equipment meets the applicable specifications.

(iii) If performance tests are used, then a performance test plan as specified in § 265.1085(b)(3) and all test results.

(iv) Information as required by § 265.1035(c)(1) and § 265.1035(c)(2).

(5) Records for all Method 27 tests performed by the owner or operator for each container used to meet the requirements of § 265.1087(b)(1)(iii) of this subpart.

(6) Records for all visual inspections conducted in accordance with the requirements of § 265.1089 of this subpart.

(7) Records for all monitoring for detectable organic emissions conducted in accordance with the requirements of § 265.1089 of this subpart.

(8) Records of the date of each attempt to repair a leak, repair methods applied, and the date of successful repair.

(9) Records for all continuous monitoring conducted in accordance with the requirements of § 265.1089 of this subpart.

(10) Records of the management of carbon removed from a carbon adsorption system conducted in accordance with § 265.1088(c)(3)(ii) of this subpart.

(11) Records for all inspections of each cover installed on a tank in accordance with the requirements of § 265.1085(b)(2) or § 265.1085(b)(5) of this subpart that includes information as listed in § 265.1091(c) of this subpart.

(b) An owner or operator electing to use air emission controls for a tank in accordance with the conditions specified in § 265.1085(c) of this subpart shall record the following information:

(1) Date and time each waste sample is collected for direct measurement of maximum organic vapor pressure in accordance with § 265.1084(c) of this subpart.

(2) Results of each determination for the maximum organic vapor pressure of the waste in the tank performed in accordance with § 265.1084(c) of this subpart.

(3) Records specifying the tank dimensions and design capacity.

(c) An owner or operator electing to use air emission controls for a tank in accordance with the requirements of § 265.1091 of this subpart shall record

the information required by § 265.1091(c) of this subpart.

(d) An owner or operator electing not to use air emission controls for a particular tank, surface impoundment, or container subject to this subpart in accordance with the conditions specified in § 265.1083(c) of this subpart shall record the information used by the owner or operator for each waste determination (e.g., test results, measurements, calculations, and other documentation) in the facility operating log. If analysis results for waste samples are used for the waste determination, then the owner or operator shall record the date, time, and location that each waste sample is collected in accordance with applicable requirements of § 265.1084 of this subpart.

(e) An owner or operator electing to comply with requirements in accordance with § 265.1083(c)(2)(vi) or § 265.1083(c)(2)(v) of this subpart shall record the identification number for the incinerator, boiler, or industrial furnace in which the hazardous waste is treated.

(f) An owner or operator designating a cover as unsafe to inspect and monitor pursuant to § 265.1089(f)(5) of this subpart or difficult to inspect and monitor pursuant to § 265.1089(f)(6) of this subpart shall record in a log that is kept in the facility operating record the following information:

(1) A list of identification numbers for tanks with covers that are designated as unsafe to inspect and monitor in accordance with the requirements of § 265.1089(f)(5) of this subpart, an explanation for each cover stating why the cover is unsafe to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

(2) A list of identification numbers for tanks with covers that are designated as difficult to inspect and monitor in accordance with the requirements of § 265.1089(f)(6) of this subpart, an explanation for each cover stating why the cover is difficult to inspect and monitor, and the plan and schedule for inspecting and monitoring each cover.

(g) All records required by paragraphs (a) through (f) of this section except as required in paragraphs (a)(1) through (a)(4) of this section shall be

maintained in the operating record for a minimum of 3 years. All records required by paragraphs (a)(1) through (a)(4) of this section shall be maintained in the operating record until the air emission control equipment is replaced or otherwise no longer in service.

(h) The owner or operator of a facility that is subject to this subpart and to the control device standards in 40 CFR part 60, subpart VV, or 40 CFR part 61, subpart V, may elect to demonstrate compliance with the applicable sections of this subpart by documentation either pursuant to this subpart, or pursuant to the provisions of 40 CFR part 60, subpart VV or 40 CFR part 61, subpart V, to the extent that the documentation required by 40 CFR parts 60 or 61 duplicates the documentation required by this section.

§ 265.1091 Alternative tank emissions control requirements.

(a) This section applies to owners and operators of tanks electing to comply with § 265.1085(b)(2) or (b)(3) of this subpart.

(1) The owner or operator electing to comply with § 265.1085(b)(2) of this subpart shall design, install, operate, and maintain a fixed roof and internal floating roof that meet the following requirements:

(i) The fixed roof shall comply with the requirements of § 265.1085(d)(1) of this subpart. The internal floating roof shall rest or float on the waste surface (but not necessarily in complete contact with it) inside a tank that has a fixed roof. The internal floating roof shall be floating on the waste surface at all times, except during initial fill and during those intervals when the tank is completely emptied or subsequently emptied and refilled. When the roof is resting on the leg supports, the process of filling, emptying, or refilling shall be continuous and shall be accomplished as rapidly as possible.

(ii) Each internal floating roof shall be equipped with one of the following closure devices between the wall of the tank and the edge of the internal floating roof:

(A) A foam- or liquid-filled seal mounted in contact with the waste (liquid-mounted seal). A liquid-mounted

seal means a foam- or liquid-filled seal mounted in contact with the waste between the wall of the tank and the floating roof continuously around the circumference of the tank.

(B) Two seals mounted one above the other so that each forms a continuous closure that completely covers the space between the wall of the tank and the edge of the internal floating roof. The lower seal may be vapor-mounted, but both shall be continuous.

(C) A mechanical shoe seal. A mechanical shoe seal is a metal sheet held vertically against the wall of the tank by springs or weighted levers and is connected by braces to the floating roof. A flexible coated fabric (envelope) spans the annular space between the metal sheet and the floating roof.

(iii) Each opening in a noncontact internal floating roof except for automatic bleeder vents (vacuum breaker vents) and the rim space vents is to provide a projection below the waste surface.

(iv) Each opening in the internal floating roof except for leg sleeves, automatic bleeder vents, rim space vents, column wells, ladder wells, sample wells, and stub drains is to be equipped with a cover or lid which is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. The cover or lid shall be equipped with a gasket. Covers on each access hatch and automatic gauge float well shall be bolted except when they are in use.

(v) Automatic bleeder vents shall be equipped with a gasket and are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports.

(vi) Rim space vents shall be equipped with a gasket and are to be set to open only when the internal floating roof is not floating or at the manufacturer's recommended setting.

(vii) Each penetration of the internal floating roof for the purpose of sampling shall be a sample well. The sample well shall have a slit fabric cover that covers at least 90 percent of the opening.

(viii) Each penetration of the internal floating roof that allows for passage of a column supporting the fixed

roof shall have a flexible fabric sleeve seal or a gasketed sliding cover.

(ix) Each penetration of the internal floating roof that allows for passage of a ladder shall have a gasketed sliding cover.

(2) The owner or operator electing to comply with § 265.1095(b)(3) of this subpart shall design, install, operate, and maintain an external floating roof that meets the following requirements:

(i) Each external floating roof shall be equipped with a closure device between the wall of the tank and the roof edge. The closure device is to consist of two seals, one above the other. The lower seal is referred to as the primary seal, and the upper seal is referred to as the secondary seal.

(A) The primary seal shall be either a mechanical shoe seal or a liquid-mounted seal. Except as provided in paragraph (b)(2)(iv) of this section, the seal shall completely cover the annular space between the edge of the floating roof and tank wall.

(B) The secondary seal shall completely cover the annular space between the external floating roof and the wall of the tank in a continuous fashion except as allowed in paragraph (b)(2)(iv) of this section.

(ii) Except for automatic bleeder vents and rim space vents, each opening in a noncontact external floating roof shall provide a projection below the waste surface. Except for automatic bleeder vents, rim space vents, roof drains, and leg sleeves, each opening in the roof is to be equipped with a gasketed cover, seal, or lid that is to be maintained in a closed position at all times (i.e., no visible gap) except when the device is in actual use. Automatic bleeder vents are to be closed at all times when the roof is floating except when the roof is being floated off or is being landed on the roof leg supports. Rim vents are to be set to open when the roof is being floated off the roof leg supports or at the manufacturer's recommended setting. Automatic bleeder vents and rim space vents are to be gasketed. Each emergency roof drain is to be provided with a slotted membrane fabric cover that covers at least 90 percent of the area of the opening.

(iii) The roof shall be floating on the waste at all times (i.e., off the roof leg

supports) except during initial fill until the roof is lifted off leg supports and when the tank is completely emptied and subsequently refilled. The process of filling, emptying, or refilling when the roof is resting on the leg supports shall be continuous and shall be accomplished as rapidly as possible.

(3) The owner or operator may elect to comply with § 265.1095(b)(2) or (b)(3) of this subpart using an alternative means of emission limitation for which a FEDERAL REGISTER notice has been published in accordance with the requirements of 40 CFR 60.114b permitting its use as an alternative means for the purpose of compliance with 40 CFR 60.112b.

(b) Monitoring and inspection of the control equipment described in paragraph (a) of this section shall be conducted as follows:

(1) After installation, owners and operators of internal floating roofs shall:

(i) Visually inspect the internal floating roof, the primary seal, and the secondary seal (if one is in service), prior to filling the tank with waste. If there are holes, tears, or other openings in the primary seal, the secondary seal, or the seal fabric, or defects in the internal floating roof, or both, the owner or operator shall repair the items before filling the tank.

(ii) For tanks equipped with a liquid-mounted or mechanical shoe primary seal, visually inspect the internal floating roof and the primary seal or the secondary seal (if one is in service) through manholes and roof hatches on the fixed roof at least once every 12 months after initial fill. If the internal floating roof is not resting on the surface of the waste inside the tank, or there is liquid accumulated on the roof, or the seal is detached, or there are holes or tears in the seal fabric, the owner or operator shall repair the items or empty and remove the tank from service within 45 days. If a failure that is detected during inspections required in this paragraph cannot be repaired within 45 days and if the tank cannot be emptied within 45 days, a 30-day extension may be requested from the Regional Administrator. Such a request for an extension shall document that alternate capacity is unavailable and specify a schedule of actions the

owner or operator will take that will assure that the control equipment will be repaired or the tank will be emptied as soon as possible.

(iii) For tanks equipped with a double-seal system as specified in paragraph (a)(1)(i)(B) of this section:

(A) Visually inspect the tank as specified in paragraph (b)(1)(iv) of this section at least every 5 years; or

(B) Visually inspect the tank as specified in paragraph (b)(1)(ii) of this section.

(iv) Visually inspect the internal floating roof, the primary seal, the secondary seal (if one is in service), gaskets, slotted membranes, and sleeve seals (if any) each time the tank is emptied and degassed. If the internal floating roof has defects; the primary seal has holes, tears, or other openings in the seal or the seal fabric; or the secondary seal has holes, tears, or other openings in the seal or the seal fabric; or the gaskets no longer close off the waste surfaces from the atmosphere; or the slotted membrane has more than 10 percent open area, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before refilling the tank with waste. In no event shall inspections conducted in accordance with this provision occur at intervals greater than 10 years in the case of tanks conducting the annual visual inspection as specified in paragraph (b)(1)(i) of this section, and at intervals no greater than 5 years in the case of tanks specified in paragraph (b)(1)(ii) of this section.

(v) Notify the Regional Administrator in writing at least 30 days prior to the filling or refilling of each tank for which an inspection is required by paragraphs (b)(1)(i) and (b)(1)(iv) of this section to afford the Regional Administrator the opportunity to have an observer present. If the inspection required by paragraph (b)(1)(iv) of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance of refilling the tank, the owner or operator shall notify the Regional Administrator at least 7 days prior to the refilling of the tank. Notification shall be made by telephone immediately fol-

lowed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification, including the written documentation, may be made in writing and sent by express mail so that it is received 7 days prior to the refilling.

(2) After installation, the owner or operator of an external floating roof shall:

(i) Determine the gap areas and maximum gap widths between the primary seal and the wall of the tank and between the secondary seal and the wall of the tank according to the following frequency:

(A) Measurements of gaps between the tank wall and the primary seal (seal gaps) shall be performed during the hydrostatic testing of the tank or within 60 days of the initial fill with waste and at least once every 5 years thereafter.

(B) Measurements of gaps between the tank wall and the secondary seal shall be performed within 60 days of the initial fill with waste and at least once per year thereafter.

(C) If any tank ceases to hold waste for a period of 1 year or more, subsequent introduction of waste into the tank shall be considered an initial fill for the purposes of paragraphs (b)(2)(i)(A) and (b)(2)(i)(B) of this section.

(ii) Determine the gap widths and areas in the primary and secondary seals individually by the following procedures:

(A) Measure seal gaps, if any, at one or more floating roof levels when the roof is floating off the roof leg supports.

(B) Measure seal gaps around the entire circumference of the tank in each place where a 0.32-cm diameter uniform probe passes freely (without forcing or binding against the seal) between the seal and the wall of the tank and measure the circumferential distance of each such location.

(C) Determine the total surface area of each gap described in paragraph (b)(2)(i)(B) of this section by using probes of various widths to measure accurately the actual distance from the tank wall to the seal and multiplying

each such width by its respective circumferential distance.

(iii) Add the gap surface area of each gap location for the primary seal and the secondary seal individually and divide the sum for each seal by the nominal diameter of the tank and compare each ratio to the respective standards in paragraph (b)(2)(iv) of this section.

(iv) Make necessary repairs or empty the tank within 45 days of identification in any inspection for seals not meeting the following requirements:

(A) The accumulated area of gaps between the tank wall and the mechanical shoe or liquid-mounted primary seal shall not exceed 212 cm² per meter of tank diameter, and the width of any portion of any gap shall not exceed 3.81 cm.

(1) One end of the mechanical shoe is to extend into the waste contained in the tank, and the other end is to extend a minimum vertical distance of 61 cm above the waste surface.

(2) There are to be no holes, tears, or other openings in the shoe, seal fabric, or seal envelope.

(B) The secondary seal is to meet the following requirements:

(1) The secondary seal is to be installed above the primary seal so that it completely covers the space between the roof edge and the tank wall except as provided in paragraph (b)(2)(i)(C) of this section.

(2) The accumulated area of gaps between the tank wall and the secondary seal shall not exceed 21.2 cm² per meter of tank diameter, and the width of any portion of any gap shall not exceed 1.27 cm.

(3) There are to be no holes, tears, or other openings in the seal or seal fabric.

(v) If a failure that is detected during inspections required in paragraph (b)(2)(i) of this section cannot be repaired within 45 days and if the tank cannot be emptied within 45 days, a 30-day extension may be requested from the Regional Administrator. Such extension request shall include a demonstration of the unavailability of alternate capacity and a specification of a schedule that will assure that the control equipment will be repaired or the tank will be emptied as soon as possible.

(vi) Notify the Regional Administrator 30 days in advance of any gap measurements required by paragraph (b)(2)(i) of this section to afford the Regional Administrator the opportunity to have an observer present.

(vii) Visually inspect the external floating roof, the primary seal, secondary seal, and fittings each time the vessel is emptied and degassed.

(A) If the external floating roof has defects, the primary seal has holes, tears, or other openings in the seal or the seal fabric, or the secondary seal has holes, tears, or other openings in the seal or the seal fabric, the owner or operator shall repair the items as necessary so that none of the conditions specified in this paragraph exist before filling or refilling the tank with waste.

(B) For all the inspections required by paragraph (b)(2)(vii) of this section, the owner or operator shall notify the Regional Administrator in writing at least 30 days prior to the filling or refilling of each tank to afford the Regional Administrator the opportunity to inspect the tank prior to refilling. If the inspection required by paragraph (b)(2)(vii) of this section is not planned and the owner or operator could not have known about the inspection 30 days in advance of refilling the tank, the owner or operator shall notify the Regional Administrator at least 7 days prior to the refilling of the tank. Notification shall be made by telephone immediately followed by written documentation demonstrating why the inspection was unplanned. Alternatively, this notification, including the written documentation, may be made in writing and sent by express mail so that it is received by the Regional Administrator at least 7 days prior to the refilling.

(c) Owners and operators who elect to install and operate the control equipment in paragraph (a) of this section shall include the following information in the operating record in accordance with the requirements of § 265.1090(a)(1) and (a)(11) of this subpart:

(1) Internal floating roof.
(i) Documentation that describes the control equipment design and certifies that the control equipment meets the specifications of paragraphs (a)(1) and (b)(1) of this section.

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(ii) Records of each inspection performed as required by paragraphs (b)(1)(i) through (b)(1)(iv) of this section. Each record shall identify the tank on which the inspection was performed and shall contain the date the tank was inspected and the observed condition of each component of the control equipment (seals, internal floating roof, and fittings).

(iii) If any of the conditions described in paragraph (b)(1)(ii) of this section are detected during the annual visual inspection required by paragraph (b)(1)(i) of this section, the records shall identify the tank, the nature of the defects, and the date the tank was emptied or the nature of and date the repair was made.

(iv) After each inspection required by paragraph (b)(1)(ii) of this section that finds holes or tears in the seal or seal fabric, or defects in the internal floating roof, or other control equipment defects listed in paragraph (b)(1)(ii) of this section, the records shall identify the tank and the reason it did not meet the specifications of paragraph (a)(1) or (b)(1)(iii) of this section and describe each repair made.

(2) External floating roof.

(i) Documentation that describes the control equipment design and certifies that the control equipment meets the specifications of paragraphs (a)(2) and (b)(2)(i) through (b)(2)(iv) of this section.

(ii) Records of each gap measurement performed as required by paragraph (b)(2) of this section. Each record shall identify the tank in which the measurement was performed, the date of measurement, the raw data obtained in the measurement, and the calculations described in paragraphs (b)(2)(i) and (b)(2)(ii) of this section.

(iii) Records for each seal gap measurement that detects gaps exceeding the limitations specified by paragraph (b)(2)(iv) of this section that identifies the tank, the date the tank was emptied or the repairs made, and the nature of the repair.

Subpart DD—Containment Buildings

Source: 57 FR 37268, Aug. 18, 1992, unless otherwise noted.

§ 265.1100 Applicability.

The requirements of this subpart apply to owners or operators who store or treat hazardous waste in units designed and operated under § 265.1101 of this subpart. These provisions will become effective on February 18, 1993, although the owner or operator may notify the Regional Administrator of his intent to be bound by this subpart at an earlier time. The owner or operator is not subject to the definition of land disposal in RCRA section 3004(k) provided that the unit:

(a) Is a completely enclosed, self-supporting structure that is designed and constructed of manmade materials of sufficient strength and thickness to support themselves, the waste contents, and any personnel and heavy equipment that operate within the units, and to prevent failure due to pressure gradients, settlement, compression, or uplift, physical contact with the hazardous wastes to which they are exposed; climatic conditions; and the stresses of daily operation, including the movement of heavy equipment within the unit and contact of such equipment with containment walls;

(b) Has a primary barrier that is designed to be sufficiently durable to withstand the movement of personnel and handling equipment within the unit;

(c) If the unit is used to manage liquids, has:

(1) A primary barrier designed and constructed of materials to prevent migration of hazardous constituents into the barrier;

(2) A liquid collection system designed and constructed of materials to minimize the accumulation of liquid on the primary barrier; and

(3) A secondary containment system designed and constructed of materials to prevent migration of hazardous constituents into the barrier, with a leak detection and liquid collection system capable of detecting, collecting, and removing leaks of hazardous constituents at the earliest possible time, unless the unit has been granted a variance from the secondary containment system requirements under § 265.1101(b)(4);

(d) Has controls as needed to permit fugitive dust emissions; and

ing regeneration) spent lead-acid batteries that are recyclable materials ("spent batteries"). Persons who generate, transport, or collect spent batteries, who regenerate spent batteries, or who store spent batteries but do not reclaim them (other than spent batteries that are to be regenerated) are not subject to regulation under parts 262 through 266 or part 270 or 124 of this chapter, and also are not subject to the requirements of section 3010 of RCRA.

Subpart D—E—(Reserved)

Subpart F—Recyclable Materials Utilized for Precious Metal Recovery

§ 266.70 Applicability and requirements.

(a) The regulations of this subpart apply to recyclable materials that are reclaimed to recover economically significant amounts of gold, silver, platinum, palladium, iridium, osmium, rhodium, ruthenium, or any combination of these.

(b) Persons who generate, transport, or store recyclable materials that are regulated under this subpart are subject to the following requirements:

(1) Notification requirements under section 3010 of RCRA;

(2) Subpart B of part 262 (for generators), §§ 263.20 and 263.21 (for transporters), and §§ 265.71 and 265.72 (for persons who store) of this chapter;

(c) Persons who store recycled materials that are regulated under this subpart must keep the following records to document that they are not accumulating these materials speculatively (as defined in § 261.1(c) of this chapter):

(1) Records showing the volume of these materials stored at the beginning of the calendar year;

(2) The amount of these materials generated or received during the calendar year; and

(3) The amount of materials remaining at the end of the calendar year.

(d) Recyclable materials that are regulated under this subpart that are accumulated speculatively (as defined in § 261.1(c) of this chapter) are subject to all applicable provisions of parts 262 through 265, 270 and 124 of this chapter.

Subpart G—Spent Lead-Acid Batteries Being Reclaimed

§ 266.80 Applicability and requirements.

(a) The regulations of this subpart apply to persons who reclaim (including

regeneration) spent lead-acid batteries that are recyclable materials ("spent batteries"). Persons who generate, transport, or collect spent batteries, who regenerate spent batteries, or who store spent batteries but do not reclaim them (other than spent batteries that are to be regenerated) are not subject to regulation under parts 262 through 266 or part 270 or 124 of this chapter, and also are not subject to the requirements of section 3010 of RCRA.

(b) Owners or operators of facilities that store spent lead acid batteries before reclaiming (other than spent batteries that are to be regenerated) them are subject to the following requirements.

(50 FR 666, Jan. 4, 1985, as amended at 50 FR 33543, Aug. 20, 1985; 60 FR 25542, May 11, 1995)

Subpart H—Hazardous Waste Burned in Boilers and Industrial Furnaces

SOURCE: 56 FR 7208, Feb. 21, 1991, unless otherwise noted.

§ 266.100 Applicability.

(a) The regulations of this subpart apply to hazardous waste burned or processed in a boiler or industrial furnace (as defined in § 260.10 of this chapter) irrespective of the purpose of burning or processing, except as provided by paragraphs (b), (c), (d), and (f) of this section. In this subpart, the term "burn" means burning for energy recovery or destruction, or processing for materials recovery or as an ingredient. The emissions standards of §§ 266.104, 266.105, 266.106, and 266.107 apply to facilities operating under interim status or under a RCRA permit as specified in §§ 266.102 and 266.103.

(b) The following hazardous wastes and facilities are not subject to regulation under this subpart:

(1) Used oil burned for energy recovery that is also a hazardous waste solely because it exhibits a characteristic of hazardous waste identified in subpart C of part 261 of this chapter. Such used oil is subject to regulation under part 279 of this chapter;

(2) Gas recovered from hazardous or solid waste landfills when such gas is burned for energy recovery;

(3) Hazardous wastes that are exempt from regulation under §§ 261.4 and 261.6(a)(3) (iv) through (vi) of this chapter, and hazardous wastes that are subject to the special requirements for conditionally exempt small quantity generators under § 261.5 of this chapter; and

(4) Coke ovens, if the only hazardous waste burned is EPA Hazardous Waste No. K087, decanter tank tar sludge from coking operations.

(c) Owners and operators of smelting, melting, and refining furnaces (including pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces, but not including cement kilns, aggregate kilns, or halogen acid furnaces burning hazardous waste) that process hazardous waste solely for metal recovery are conditionally exempt from regulation under this subpart, except for §§ 266.101 and 266.112.

(1) To be exempt from §§ 266.102 through 266.111, an owner or operator of a metal recovery furnace or mercury recovery furnace, must comply with the following requirements, except that an owner or operator of a lead or a nickel-chromium recovery furnace, or a metal recovery furnace that burns baghouse bags used to capture metallic dusts emitted by steel manufacturing, must comply with the requirements of paragraph (c)(3) of this section:

(i) Provide a one-time written notice to the Director indicating the following:

(A) The owner or operator claims exemption under this paragraph;

(B) The hazardous waste is burned solely for metal recovery consistent with the provisions of paragraph (c)(2) of this section;

(C) The hazardous waste contains recoverable levels of metals; and

(D) The owner or operator will comply with the sampling and analysis and recordkeeping requirements of this paragraph;

(ii) Sample and analyze the hazardous waste and other feedstocks as necessary to comply with the requirements of this paragraph under procedures specified by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, incorporated by reference in § 260.11 of this

chapter or alternative methods that meet or exceed the SW-846 method performance capabilities. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method; and

(iii) Maintain at the facility for at least three years records to document compliance with the provisions of this paragraph including limits on levels of toxic organic constituents and recoverable metals in the hazardous waste compared to normal nonhazardous waste feedstocks.

(2) A hazardous waste meeting either of the following criteria is not processed solely for metal recovery:

(i) The hazardous waste has a total concentration of organic compounds listed in part 261, appendix VIII, of this chapter exceeding 500 ppm by weight, as-fired, and so is considered to be burned for destruction. The concentration of organic compounds in a waste as-generated may be reduced to the 500 ppm limit by *bona fide* treatment that removes or destroys organic constituents. Blending for dilution to meet the 500 ppm limit is prohibited and documentation that the waste has not been impermissibly diluted must be retained in the records required by paragraph (c)(1)(iii) of this section; or

(ii) The hazardous waste has a heating value of 5,000 Btu/lb or more, as-fired, and so is considered to be burned as fuel. The heating value of a waste as-generated may be reduced to below the 5,000 Btu/lb limit by *bona fide* treatment that removes or destroys organic constituents. Blending for dilution to meet the 5,000 Btu/lb limit is prohibited and documentation that the waste has not been impermissibly diluted must be retained in the records required by paragraph (c)(1)(iii) of this section.

(3) To be exempt from §§ 266.102 through 266.111, an owner or operator of a lead or nickel-chromium or mercury recovery furnace, or a metal recovery furnace that burns baghouse bags used to capture metallic dusts emitted by steel manufacturing, must provide a one-time written notice to the Director identifying each hazardous waste burned and specifying whether the owner or operator claims an exemption

for each waste under this paragraph or paragraph (c)(1) of this section. The owner or operator must comply with the requirements of paragraph (c)(1) of this section for those wastes claimed to be exempt under that paragraph and must comply with the requirements below for those wastes claimed to be exempt under this paragraph (c)(3).

(1) The hazardous wastes listed in appendices XI, XII, and XIII, part 266, and baghouse bags used to capture metallic dusts emitted by steel manufacturing are exempt from the requirements of paragraph (c)(1) of this section, provided that:

(A) A waste listed in appendix IX of this part must contain recoverable levels of lead, a waste listed in appendix XII of this part must contain recoverable levels of nickel or chromium, a waste listed in appendix XIII of this part must contain recoverable levels of mercury and contain less than 500 ppm of 40 CFR part 261, appendix VIII or organic constituents, and baghouse bags used to capture metallic dusts emitted by steel manufacturing must contain recoverable levels of metal; and

(B) The Director may decide on a case-by-case basis that the toxic organic constituents in a material listed in appendix XI, XII, or XIII of this part that contains a total concentration of more than 500 ppm toxic organic compounds listed in appendix VIII, part 261 of this chapter, may pose a hazard to human health and the environment when burned in a metal recovery furnace exempt from the requirements of this subpart. In that situation, after adequate notice and opportunity for comment, the metal recovery furnace will become subject to the requirements of this subpart when burning that material. In making the hazard determination, the Director will consider the following factors:

(A) The concentration and toxicity of organic constituents in the material; and

(B) The level of destruction of toxic organic constituents provided by the furnace; and

(C) Whether the acceptable ambient levels established in appendices IV or V of this part may be exceeded for any toxic organic compound that may be emitted based on dispersion modeling

to predict the maximum annual average off-site ground level concentration.

(d) The standards for direct transfer operations under § 266.111 apply only to facilities subject to the permit standards of § 266.102 or the Interim status standards of § 266.103.

(e) The management standards for residues under § 266.112 apply to any boiler or industrial furnace burning hazardous waste.

(f) Owners and operators of smelting, melting, and refining furnaces (including pyrometallurgical devices such as cupolas, sintering machines, roasters, and foundry furnaces) that process hazardous waste for recovery of economically significant amounts of the precious metals gold, silver, platinum, palladium, iridium, osmium, rhodium, or ruthenium, or any combination of these are conditionally exempt from regulation under this subpart, except for § 266.112. To be exempt from § 266.101 through 266.111, an owner or operator must:

(1) Provide a one-time written notice to the Director indicating the following:

(i) The owner or operator claims exemption under this paragraph;

(ii) The hazardous waste is burned for legitimate recovery of precious metal; and

(iii) The owner or operator will comply with the sampling and analysis and recordkeeping requirements of this paragraph; and

(2) Sample and analyze the hazardous waste as necessary to document that the waste is burned for recovery of economically significant amounts of precious metal using procedures specified by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, SW-846, incorporated by reference in § 260.11 of this chapter or alternative methods that meet or exceed the SW-846 method performance capabilities. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method; and

(3) Maintain at the facility for at least three years records to document that all hazardous wastes burned are

burned for recovery of economically significant amounts of precious metal.

56 FR 7208, Feb. 21, 1991; 56 FR 32688, July 17, 1991, as amended at 56 FR 42513, Aug. 27, 1991; 56 FR 13877, Sept. 5, 1991; 57 FR 27899, June 22, 1992; 57 FR 38564, Aug. 25, 1992; 57 FR 41612, Sept. 10, 1992; 59 FR 38545, July 28, 1994; 59 FR 48042, Sept. 19, 1994

§ 266.101 Management prior to burning.

(a) *Generators.* Generators of hazardous waste that is burned in a boiler or industrial furnace are subject to part 262 of this chapter.

(b) *Transporters.* Transporters of hazardous waste that is burned in a boiler or industrial furnace are subject to part 263 of this chapter.

(c) *Storage facilities.* (1) Owners and operators of facilities that store hazardous waste that is burned in a boiler or industrial furnace are subject to the applicable provisions of parts 264, 265, and 270 of this chapter, except as provided by paragraph (c)(2) of this section. These standards apply to storage facilities operated by intermediaries (processors, blenders, distributors, etc.) between the generator and the burner.

(2) Owners and operators of facilities that burn, in an onsite boiler or industrial furnace exempt from regulation under the small quantity burner provisions of § 266.108, hazardous waste that they generate are exempt from the regulations of parts 264, 265, and 270 of this chapter applicable to storage units for those storage units that store mixtures of hazardous waste and the primary fuel to the boiler or industrial furnace in tanks that feed the fuel mixture directly to the burner. Storage of hazardous waste prior to mixing with the primary fuel is subject to regulation as prescribed in paragraph (c)(1) of this section.

56 FR 7208, Feb. 21, 1991, as amended at 57 FR 38564, Aug. 25, 1992

§ 266.102 Permit standards for burners.

(a) *Applicability.*—(1) *General.* Owners and operators of boilers and industrial furnaces burning hazardous waste and not operating under Interim status must comply with the requirements of this section and §§ 270.22 and 270.66 of

this chapter, unless exempt under the small quantity burner exemption of § 266.108.

(2) *Applicability of part 264 standards.* Owners and operators of boilers and industrial furnaces that burn hazardous waste are subject to the following provisions of part 264 of this chapter, except as provided otherwise by this subpart:

(i) In subpart A (General), 264.4; (ii) In subpart B (General facility standards), §§ 264.11–264.18;

(iii) In subpart C (Preparedness and prevention), §§ 264.31–264.37;

(iv) In subpart D (Contingency plan and emergency procedures), §§ 264.51–264.56;

(v) In subpart E (Manifest system, recordkeeping, and reporting), the applicable provisions of §§ 264.71–264.77;

(vi) In subpart F (Corrective Action), §§ 264.90 and 264.101;

(vii) In subpart G (Closure and post-closure), §§ 264.111–264.115;

(viii) In subpart H (Financial requirements), §§ 264.141, 264.142, 264.143, and 264.147–264.151, except that States and the Federal government are exempt from the requirements of subpart H; and

(ix) Subpart BB (Air emission standards for equipment leaks), except §§ 264.1050(a).

(b) *Hazardous waste analysis.* (1) The owner or operator must provide an analysis of the hazardous waste that quantifies the concentration of any constituent identified in appendix VIII of part 261 of this chapter that may reasonably be expected to be in the waste. Such constituents must be identified and quantified if present, at levels detectable by analytical procedures prescribed by Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (incorporated by reference, see § 260.11 of this chapter). Alternative methods that meet or exceed the method performance capabilities of SW-846 may be used. If SW-846 does not prescribe a method for a particular determination, the owner or operator shall use the best available method. The appendix VIII, part 261 constituents excluded from this analysis must be identified and the basis for their exclusion explained. This analysis will be used to provide all information re-

quired by this subpart and § 270.22 and § 270.66 of this chapter and to enable the permit writer to prescribe such permit conditions as necessary to protect human health and the environment. Such analysis must be included as a portion of the part B permit application, or, for facilities operating under the interim status standards of this subpart, as a portion of the trial burn plan that may be submitted before the part B application under provisions of § 270.66(g) of this chapter as well as any other analysis required by the permit authority in preparing the permit. Owners and operators of boilers and industrial furnaces not operating under the interim status standards must provide the information required by §§ 270.22 or 270.66(c) of this chapter in the part B application to the greatest extent possible.

(2) Throughout normal operation, the owner or operator must conduct sampling and analysis as necessary to ensure that the hazardous waste, other fuels, and industrial furnace feedstocks fired into the boiler or industrial furnace are within the physical and chemical composition limits specified in the permit.

(c) *Emissions standards.* Owners and operators must comply with emissions standards provided by §§ 266.104 through 266.107.

(d) *Permits.* (1) The owner or operator may burn only hazardous wastes specified in the facility permit and only under the operating conditions specified under paragraph (e) of this section, except in approved trial burns under the conditions specified in § 270.66 of this chapter.

(2) Hazardous wastes not specified in the permit may not be burned until operating conditions have been specified under a new permit or permit modification, as applicable. Operating requirements for new wastes may be based on either trial burn results or alternative data included with part B of a permit application under § 270.22 of this chapter.

(3) Boilers and industrial furnaces operating under the interim status standards of § 266.103 are permitted under procedures provided by § 270.66(g) of this chapter.

(4) A permit for a new boiler or industrial furnace (those boilers and industrial furnaces not operating under the interim status standards) must establish appropriate conditions for each of the applicable requirements of this section, including but not limited to allowable hazardous waste firing rates and operating conditions necessary to meet the requirements of paragraph (e) of this section, in order to comply with the following standards:

(i) For the period beginning with initial introduction of hazardous waste and ending with initiation of the trial burn, and only for the minimum time required to bring the device to a point of operational readiness to conduct a trial burn, not to exceed a duration of 720 hours operating time when burning hazardous waste, the operating requirements must be those most likely to ensure compliance with the emission standards of §§ 266.104 through 266.107, based on the Director's engineering judgment. If the applicant is seeking a waiver from a trial burn to demonstrate conformance with a particular emission standard, the operating requirements during this initial period of operation shall include those specified by the applicable provisions of § 266.104, § 266.105, § 266.106, or § 266.107. The Director may extend the duration of this period for up to 720 additional hours when good cause for the extension is demonstrated by the applicant.

(ii) For the duration of the trial burn, the operating requirements must be sufficient to demonstrate compliance with the emissions standards of §§ 266.104 through 266.107 and must be in accordance with the approved trial burn plan;

(iii) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, submission of the trial burn results by the applicant, review of the trial burn results and modification of the facility permit by the Director to reflect the trial burn results, the operating requirements must be those most likely to ensure compliance with the emission standards §§ 266.104 through 266.107 based on the Director's engineering judgment.

(iv) For the remaining duration of the permit, the operating requirements must be those demonstrated in a trial burn or by alternative data specified in § 270.22 of this chapter, as sufficient to ensure compliance with the emissions standards of §§ 266.104 through 266.107.

(e) *Operating requirements—(1) General.* A boiler or industrial furnace burning hazardous waste must be operated in accordance with the operating requirements specified in the permit at all times where there is hazardous waste in the unit.

(2) *Requirements to ensure compliance with the organic emissions standards—(i) DRE standard.* Operating conditions will be specified either on a case-by-case basis for each hazardous waste burned as those demonstrated (in a trial burn or by alternative data as specified in § 270.22) to be sufficient to comply with the destruction and removal efficiency (DRE) performance standard of § 266.104(a) or as those special operating requirements provided by § 266.104(a)(4) for the waiver of the DRE trial burn. When the DRE trial burn is not waived under § 266.104(a)(4), each set of operating requirements will specify the composition of the hazardous waste (including acceptable variations in the physical and chemical properties of the hazardous waste which will not affect compliance with the DRE performance standard) to which the operating requirements apply. For each such hazardous waste, the permit will specify acceptable operating limits including, but not limited to, the following conditions as appropriate:

(A) Feed rate of hazardous waste and other fuels measured and specified as prescribed in paragraph (e)(6) of this section;

(B) Minimum and maximum device production rate when producing normal product expressed in appropriate units, measured and specified as prescribed in paragraph (e)(6) of this section;

(C) Appropriate controls of the hazardous waste firing system;

(D) Allowable variation in boiler and industrial furnace system design or operating procedures;

(E) Minimum combustion gas temperature measured at a location indic-

ative of combustion chamber temperature, measured and specified as prescribed in paragraph (e)(6) of this section;

(F) An appropriate indicator of combustion gas velocity, measured and specified as prescribed in paragraph (e)(6) of this section, unless documentation is provided under § 270.66 of this chapter demonstrating adequate combustion gas residence time; and

(G) Such other operating requirements as are necessary to ensure that the DRE performance standard of § 266.104(a) is met.

(ii) *Carbon monoxide and hydrocarbon standards.* The permit must incorporate a carbon monoxide (CO) limit and, as appropriate, a hydrocarbon (HC) limit as provided by paragraphs (b), (c), (d), (e) and (f) of § 266.104. The permit limits will be specified as follows:

(A) When complying with the CO standard of § 266.104(b)(1), the permit limit is 100 ppmv;

(B) When complying with the alternative CO standard under § 266.104(c), the permit limit for CO is based on the trial burn and is established as the average over all valid runs of the highest hourly rolling average CO level of each run, and the permit limit for HC is 20 ppmv (as defined in § 266.104(c)(1)), except as provided in § 266.104(f).

(C) When complying with the alternative HC limit for industrial furnaces under § 266.104(f), the permit limit for HC and CO is the baseline level when hazardous waste is not burned as specified by that paragraph.

(iii) *Start-up and shut-down.* During start-up and shut-down of the boiler or industrial furnace, hazardous waste (except waste fed solely as an ingredient under the Tier I (or adjusted Tier I) feed rate screening limits for metals and chloride/chlorine, and except low risk waste exempt from the trial burn requirements under §§ 266.104(a)(5), 266.105, 266.106, and 266.107) must not be fed into the device unless the device is operating within the conditions of operation specified in the permit.

(3) *Requirements to ensure conformance with the particulate standard.* (i) Except as provided in paragraphs (e)(3) (ii) and (iii) of this section, the permit shall specify the following operating requirements to ensure conformance with the

an hourly rolling average basis defined as follows:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(ii) An hourly rolling average is the arithmetic mean of the 60 most recent 1-minute average values recorded by the continuous monitoring system.

(2) The permit limit for the parameter shall be established based on trial burn data as the average over all valid test runs of the highest hourly rolling average value for each run.

(i) *Rolling average limits for carcinogenic metals and lead.* Feed rate limits for the carcinogenic metals (i.e., arsenic, beryllium, cadmium and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (e)(6)(i) of this section or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an average period from 2 to 24 hours:

(A) The feed rate of each metal shall be limited at any time to ten times the feed rate that would be allowed on an hourly rolling average basis;

(B) The continuous monitor shall meet the following specifications:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(2) The rolling average for the selected averaging period is defined as the arithmetic mean of one hour block averages for the averaging period. A one hour block average is the arithmetic mean of the one minute averages recorded during the 60-minute period beginning at one minute after the beginning of preceding clock hour; and

(C) The permit limit for the feed rate of each metal shall be established based on trial burn data as the average over all valid test runs of the highest hourly rolling average feed rate for each run.

(iii) *Feed rate limits for metals, total chlorine and chlorine, and ash.* Feed rate

limits for metals, total chlorine and chloride, and ash are established and monitored by knowing the concentration of the substance (i.e., metals, chloride/chlorine, and ash) in each feedstream and the flow rate of the feedstream. To monitor the feed rate of these substances, the flow rate of each feedstream must be monitored under the continuous monitoring requirements of paragraphs (e)(6)(i) and (ii) of this section.

(iv) *Conduct of trial burn testing.* (A) If compliance with all applicable emissions standards of § 266.104 through 266.107 is not demonstrated simultaneously during a set of test runs, the operating conditions of additional test runs required to demonstrate compliance with remaining emissions standards must be as close as possible to the original operating conditions.

(B) Prior to obtaining test data for purposes of demonstrating compliance with the emissions standards of § 266.104 through 266.107 or establishing limits on operating parameters under this section, the facility must operate under trial burn conditions for a sufficient period to reach steady-state operations. The Director may determine, however, that industrial furnaces that recycle collected particulate matter back into the furnace and that comply with an alternative implementation approach for metals under § 266.106(f) need not reach steady state conditions with respect to the flow of metals in the system prior to beginning compliance testing for metals emissions.

(C) Trial burn data on the level of an operating parameter for which a limit must be established in the permit must be obtained during emissions sampling for the pollutant(s) (i.e., metals, PM, HCl/Cl₂, organic compounds) for which the parameter must be established as specified by paragraph (e) of this section.

(7) *General requirements—(i) Fugitive emissions.* Fugitive emissions must be controlled by:

(A) Keeping the combustion zone totally sealed against fugitive emissions; or

(B) Maintaining the combustion zone pressure lower than atmospheric pressure; or

(C) An alternate means of control demonstrated (with part B of the permit application) to provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure.

(ii) *Automatic waste feed cutoff.* A boiler or industrial furnace must be operated with a functioning system that automatically cuts off the hazardous waste feed when operating conditions deviate from those established under this section. The Director may limit the number of cutoffs per an operating period on a case-by-case basis. In addition:

(A) The permit limit for the indicator of minimum combustion chamber temperature must be maintained while hazardous waste or hazardous waste residues remain in the combustion chamber.

(B) Exhaust gases must be ducted to the air pollution control system operated in accordance with the permit requirements while hazardous waste or hazardous waste residues remain in the combustion chamber; and

(C) Operating parameters for which permit limits are established must continue to be monitored during the cutoff, and the hazardous waste feed shall not be restarted until the levels of those parameters comply with the permit limits. For parameters that may be monitored on an instantaneous basis, the Director will establish a minimum period of time after a waste feed cutoff during which the parameter must not exceed the permit limit before the hazardous waste feed may be restarted.

(iii) *Changes.* A boiler or industrial furnace must cease burning hazardous waste when changes in combustion properties, or feed rates of the hazardous waste, other fuels, or industrial furnace feedstocks, or changes in the boiler or industrial furnace design or operating conditions deviate from the limits as specified in the permit.

(8) *Monitoring and inspections.* (i) The owner or operator must monitor and record the following, at a minimum, while burning hazardous waste:

(A) If specified by the permit, feed rates and composition of hazardous waste, other fuels, and industrial fur-

nace feedstocks, and feed rates of ash, metals, and total chloride and chlorine;

(B) If specified by the permit, carbon monoxide (CO), hydrocarbons (HC), and oxygen on a continuous basis at a corner point in the boiler or industrial furnace downstream of the combustion zone and prior to release of stack gases to the atmosphere in accordance with operating requirements specified in paragraph (e)(2)(ii) of this section. CO, HC, and oxygen monitors must be installed, operated, and maintained in accordance with methods specified in appendix IX of this part.

(C) Upon the request of the Director, sampling and analysis of the hazardous waste (and other fuels and industrial furnace feedstocks as appropriate), residues, and exhaust emissions must be conducted to verify that the operating requirements established in the permit achieve the applicable standards of §§ 266.104, 266.105, 266.106, and 266.107.

(ii) All monitors shall record data in units corresponding to the permit limit unless otherwise specified in the permit.

(iii) The boiler or industrial furnace and associated equipment (pumps, valves, pipes, fuel storage tanks, etc.) must be subjected to thorough visual inspection when it contains hazardous waste, at least daily for leaks, spills, fugitive emissions, and signs of tampering.

(iv) The automatic hazardous waste feed cutoff system and associated alarms must be tested at least once every 7 days when hazardous waste is burned to verify operability, unless the applicant demonstrates to the Director that weekly inspections will unduly restrict or upset operations and that less frequent inspections will be adequate. At a minimum, operational testing must be conducted at least once every 30 days.

(v) These monitoring and inspection data must be recorded and the records must be placed in the operating record required by § 264.73 of this chapter.

(9) *Direct transfer to the burner.* If hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit, the owner and operator must comply with § 266.111.

(10) *Recordkeeping.* The owner or operator must keep in the operating record of the facility all information and data required by this section until closure of the facility.

(11) *Closure.* At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the boiler or industrial furnace.

[56 FR 7206, Feb. 21, 1991; 56 FR 32698, July 17, 1991, as amended at 56 FR 42512, 42514, Aug. 27, 1991]

§ 266.103 Interim status standards for burners.

(a) *Purpose, scope, applicability.*—(1) *General.* (i) The purpose of this section is to establish minimum national standards for owners and operators of "existing" boilers and industrial furnaces that burn hazardous waste where such standards define the acceptable management of hazardous waste during the period of interim status. The standards of this section apply to owners and operators of existing facilities until either a permit is issued under § 266.102(d) or until closure responsibilities identified in this section are fulfilled.

(ii) *Existing or in existence* means a boiler or industrial furnace that on or before August 21, 1991 is either in operation burning or processing hazardous waste or for which construction (including the ancillary facilities to burn or to process the hazardous waste) has commenced. A facility has commenced construction if the owner or operator has obtained the Federal, State, and local approvals or permits necessary to begin physical construction; and either:

(A) A continuous on-site, physical construction program has begun; or
(B) The owner or operator has entered into contractual obligations which cannot be canceled or modified without substantial loss—for physical construction of the facility to be completed within a reasonable time.

(iii) If a boiler or industrial furnace is located at a facility that already has a permit or interim status, then the facility must comply with the applicable regulations dealing with permit mod-

(i) *Controls.* (A) The hazardous waste shall be fed at a location where combustion gas temperatures are at least 1800 °F.

(B) The owner or operator must determine that adequate oxygen is present in combustion gases to combust organic constituents in the waste and retain documentation of such determination in the facility record; (C) For cement kiln systems, the hazardous waste shall be fed into the kiln; and

(D) The hydrocarbon controls of § 266.104(c) or paragraph (c)(5) of this section apply upon certification of compliance under paragraph (c) of this section irrespective of the CO level achieved during the compliance test.

(ii) *Burning hazardous waste solely as an ingredient.* A hazardous waste is burned for a purpose other than solely as an ingredient if it meets either of these criteria:

(A) The hazardous waste has a total concentration of nonmetal compounds listed in part 261, appendix VIII, of this chapter exceeding 500 ppm by weight, as-fired, and so is considered to be burned for destruction. The concentration of nonmetal compounds in a waste as-generated may be reduced to the 500 ppm limit by *bona fide* treatment that removes or destroys nonmetal constituents. Blending for dilution to meet the 500 ppm limit is prohibited and documentation that the waste has not been impermissibly diluted must be retained in the facility record; or

(B) The hazardous waste has a heating value of 5,000 Btu/lb or more, as-fired, and so is considered to be burned as fuel. The heating value of a waste as-generated may be reduced to below the 5,000 Btu/lb limit by *bona fide* treatment that removes or destroys organic constituents. Blending to augment the heating value to meet the 5,000 Btu/lb limit is prohibited and documentation that the waste has not been impermissibly blended must be retained in the facility record.

(5) *Restrictions on burning hazardous waste that is not a fuel.* Prior to certification of compliance under paragraph (c) of this section, owners and operators shall not feed hazardous waste that has a heating value less than 5,000 Btu/lb, as-generated, (except that the

heating value of a waste as-generated may be increased to above the 5,000 Btu/lb limit by *bona fide* treatment; however, blending to augment the heating value to meet the 5,000 Btu/lb limit is prohibited and records must be kept to document that impermissible blending has not occurred) in a boiler or industrial furnace, except that:

(i) Hazardous waste may be burned solely as an ingredient; or
(ii) Hazardous waste may be burned for purposes of compliance testing (or testing prior to compliance testing) for a total period of time not to exceed 720 hours; or

(iii) Such waste may be burned if the Director has documentation to show that, prior to August 21, 1991:

(A) The boiler or industrial furnace is operating under the interim status standards for incinerators provided by subpart O of part 265 of this chapter, or the interim status standards for thermal treatment units provided by subpart P of part 265 of this chapter; and
(B) The boiler or industrial furnace met the interim status eligibility requirements under § 270.70 of this chapter for subpart O or subpart P of part 265 of this chapter; and

(C) Hazardous waste with a heating value less than 5,000 Btu/lb was burned prior to that date; or

(iv) Such waste may be burned in a halogen acid furnace if the waste was burned as an excluded ingredient under § 261.2(e) of this chapter prior to February 21, 1991 and documentation is kept on file supporting this claim.

(7) *Direct transfer to the burner.* If hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit, the owner and operator must comply with § 266.111.

(b) *Certification of precompliance.*—(1) *General.* The owner or operator must provide complete and accurate information specified in paragraph (b)(2) of this section to the Director on or before August 21, 1991, and must establish limits for the operating parameters specified in paragraph (b)(3) of this section. Such information is termed a "certification of precompliance" and constitutes a certification that the owner or operator has determined that, when the facility is operated within

the limits specified in paragraph (b)(3) of this section, the owner or operator believes that, using best engineering judgment, emissions of particulate matter, metals, and HCl and Cl₂ are not likely to exceed the limits provided by §§ 266.105, 266.106, and 266.107. The facility may burn hazardous waste only under the operating conditions that the owner or operator establishes under paragraph (b)(3) of this section until the owner or operator submits a revised certification of precompliance under paragraph (b)(8) of this section or a certification of compliance under paragraph (c) of this section, or until a permit is issued.

(2) *Information required.* The following information must be submitted with the certification of precompliance to support the determination that the limits established for the operating parameters identified in paragraph (b)(3) of this section are not likely to result in an exceedance of the allowable emission rates for particulate matter, metals, and HCl and Cl₂:

(i) General facility information:
(A) EPA facility ID number;
(B) Facility name, contact person, telephone number, and address;
(C) Description of boilers and industrial furnaces burning hazardous waste, including type and capacity of device;
(D) A scaled plot plan showing the entire facility and location of the boilers and industrial furnaces burning hazardous waste; and
(E) A description of the air pollution control system on each device burning hazardous waste, including the temperature of the flue gas at the inlet to the particulate matter control system.

(ii) Except for facilities complying with the Tier I or Adjusted Tier I feed rate screening limits for metals or total chlorine and chloride provided by §§ 266.106 (b) or (e) and 266.107 (b)(1) or (e), respectively, the estimated uncontrolled (at the inlet to the air pollution control system) emissions of particulate matter, each metal controlled by § 266.106, and hydrogen chloride and chlorine, and the following information to support such determinations:
(A) The feed rate (lb/hr) of ash, chlorine, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium in each

feedstream (hazardous waste, other fuels, industrial furnace feedstocks);
(B) The estimated partitioning factor to the combustion gas for the materials identified in paragraph (b)(2)(ii)(A) of this section and the basis for the estimate and an estimate of the partitioning to HCl and Cl₂ of total chlorine and chlorine in feed materials. To estimate the partitioning factor, the owner or operator must use either best engineering judgment or the procedures specified in appendix IX of this part.

(C) For industrial furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions standards under paragraph (c)(3)(ii)(A), the estimated enrichment factor for each metal. To estimate the enrichment factor, the owner or operator must use either best engineering judgment or the procedures specified in "Alternative Methodology for Implementing Metals Controls" in appendix IX of this part.

(D) If best engineering judgment is used to estimate partitioning factors or enrichment factors under paragraphs (b)(2)(ii)(B) or (b)(2)(ii)(C) respectively, the basis for the judgment. When best engineering judgment is used to develop or evaluate data or information and make determinations under this section, the determinations must be made by a qualified, registered professional engineer and a certification of his/her determinations in accordance with § 270.11(d) of this chapter must be provided in the certification of precompliance.

(iii) For facilities complying with the Tier I or Adjusted Tier I feed rate screening limits for metals or total chlorine and chloride provided by §§ 266.106 (b) or (e) and 266.107 (b)(1) or (e), the feed rate (lb/hr) of total chlorine and chlorine, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium in each feed stream (hazardous waste, other fuels, industrial furnace feedstocks).

(iv) For facilities complying with the Tier II or Tier III emission limits for metals or HCl and Cl₂ (under §§ 266.106 (c) or (d) or 266.107(b)(2) or (c)), the estimated controlled (outlet of the air pol-

lution control system) emissions rates of particulate matter, each metal controlled by § 266.106, and HCl and Cl₂, and the following information to support such determinations:

(A) The estimated air pollution control system (APCS) removal efficiency for particulate matter, HCl, Cl₂, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium.

(B) To estimate APCS removal efficiency, the owner or operator must use either best engineering judgment or the procedures prescribed in appendix IX of this part.

(C) If best engineering judgment is used to estimate APCS removal efficiency, the basis for the judgment. Use of best engineering judgment must be in conformance with provisions of paragraph (b)(2)(ii)(D) of this section.

(v) Determination of allowable emissions rates for HCl, Cl₂, antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, silver, and thallium, and the following information to support such determinations:

(A) For all facilities:

(1) Physical stack height;
(2) Good engineering practice stack height as defined by 40 CFR 51.100(i);
(3) Maximum flue gas flow rate;

(4) Maximum flue gas temperature;
(5) Attach a US Geological Service topographic map (or equivalent) showing the facility location and surrounding land within 5 km of the facility;

(6) Identify terrain type: complex or noncomplex; and
(7) Identify land use: urban or rural.

(B) For owners and operators using Tier III site specific dispersion modeling to determine allowable levels under § 266.106(d) or § 266.107(c), or Adjusted Tier I feed rate screening limits under §§ 266.106(e) or 266.107(e):

(1) Dispersion model and version used;
(2) Source of meteorological data;

(3) The dilution factor in micrograms per cubic meter per gram per second of emissions for the maximum annual average off-site (unless on-site is required) ground level concentration (MEI location); and
(4) Indicate the MEI location on the map required under paragraph (b)(2)(v)(A)(5);

(vi) For facilities complying with the Tier II or III emissions rate controls for metals or HCl and Cl₂, a comparison of the estimated controlled emissions rates determined under paragraph (b)(2)(iv) with the allowable emission rates determined under paragraph (b)(2)(v);

(vii) For facilities complying with the Tier I (or adjusted Tier I) feed rate screening limits for metals or total chlorine and chlorine, a comparison of actual feed rates of each metal and total chlorine and chloride determined under paragraph (b)(2)(ii) of this section to the Tier I allowable feed rates; and

(viii) For industrial furnaces that feed hazardous waste for any purpose other than solely as an ingredient (as defined by paragraph (a)(5)(ii) of this section) at any location other than the product discharge end of the device, documentation of compliance with the requirements of paragraphs (a)(5)(i) (A), (B), and (C) of this section.

(ix) For industrial furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions standards under paragraph (c)(3)(ii)(A) of this section:

(A) The applicable particulate matter standard in lb/hr; and

(B) The precompliance limit on the concentration of each metal in collected PM.

(3) *Limits on operating conditions.* The owner and operator shall establish limits on the following parameters consistent with the determinations made under paragraph (b)(2) of this section and certify (under provisions of paragraph (b)(9) of this section) to the Director that the facility will operate within the limits during interim status when there is hazardous waste in the unit until revised certification of precompliance under paragraph (b)(8) of this section or certification of compliance under paragraph (c) of this section:

(i) Feed rate of total hazardous waste and (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106 (b) or (e)) pumpable hazardous waste;
(ii) Feed rate of each metal in the following feed streams:

(A) Total feed streams, except that industrial furnaces that comply with the alternative metals implementation approach under paragraph (b)(4) of this section must specify limits on the concentration of each metal in collected particulate matter in lieu of feed rate limits for total feedstreams;

(B) Total hazardous waste feed, unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106 (b) or (e); and

(C) Total pumpable hazardous waste feed, unless complying with the Tier I or adjusted Tier I metals feed rate screening limits under § 266.106 (b) or (e);

(iii) Total feed rate of chlorine and chloride in total feed streams;

(iv) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light-weight aggregate kilns is not limited; and

(v) Maximum production rate of the device in appropriate units when producing normal product, unless complying with the Tier I or Adjusted Tier I feed rate screening limits for chlorine under § 266.107 (b)(1) or (e) and for all metals under § 266.106 (b) or (e), and the uncontrolled particulate emissions do not exceed the standard under § 266.105.

(4) Operating requirements for furnaces that recycle PM. Owners and operators of furnaces that recycle collected particulate matter (PM) back into the furnace and that will certify compliance with the metals emissions controls under paragraph (c)(3)(i)(A) of this section must comply with the special operating requirements provided in "Alternative Metals Controls" in appendix IX of this part.

(5) Measurement of feed rates and production rate—(i) General requirements. Limits on each of the parameters specified in paragraph (b)(3) of this section (except for limits on metals concentrations in collected particulate matter (PM) for industrial furnaces that recycle collected PM) shall be established and continuously monitored under either of the following methods:

(A) *Instantaneous limits.* A limit for a parameter may be established and continuously monitored and recorded on an instantaneous basis (i.e., the value

that occurs at any time) not to be exceeded at any time; or
(B) *Hourly rolling average limits.* A limit for a parameter may be established and continuously monitored on an hourly rolling average basis defined as follows:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(2) An hourly rolling average is the arithmetic mean of the 60 most recent 1-minute average values recorded by the continuous monitoring system.

(ii) Rolling average limits for carcinogenic metals and lead. Feed rate limits for the carcinogenic metals (arsenic, beryllium, cadmium, and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (b)(5)(X)(B) or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an averaging period from 2 to 24 hours:

(A) The feed rate of each metal shall be limited at any time to ten times the feed rate that would be allowed on a hourly rolling average basis;

(B) The continuous monitor shall meet the following specifications:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(2) The rolling average for the selected averaging period is defined as the arithmetic mean of one hour block averages for the averaging period. A one hour block average is the arithmetic mean of the one minute averages recorded during the 60-minute period beginning at one minute after the beginning of preceding clock hour.

(ii) Feed rate limits for metals, total chloride and chlorine, and ash. Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored by knowing the concentration of the substance (i.e., metals, chloride/chlorine, and ash) in each feedstream and the flow rate of the feedstream. To monitor the feed rate of

these substances, the flow rate of each feedstream must be monitored under the continuous monitoring requirements of paragraphs (b)(5) (i) and (ii) of this section.

(6) *Public notice requirements at precompliance.* On or before August 21, 1991 the owner or operator must submit a notice with the following information for publication in a major local newspaper of general circulation and send a copy of the notice to the appropriate units of State and local government. The owner and operator must provide to the Director with the certification of precompliance evidence of submitting the notice for publication. The notice, which shall be entitled "Notice of Certification of Precompliance with Hazardous Waste Burning Requirements of 40 CFR 266.103(b)", must include:

(i) Name and address of the owner and operator of the facility as well as the location of the device burning hazardous waste;

(ii) Date that the certification of precompliance is submitted to the Director;

(iii) Brief description of the regulatory process required to comply with the interim status requirements of this section including required emissions testing to demonstrate conformance with emissions standards for organic compounds, particulate matter, metals, and HCl and Cl₂;

(iv) Types and quantities of hazardous waste burned including, but not limited to, source, whether solids or liquids, as well as an appropriate description of the waste;

(v) Type of device(s) in which the hazardous waste is burned including a physical description and maximum production rate of each device;

(vi) Types and quantities of other fuels and industrial furnace feedstocks fed to each unit;

(vii) Brief description of the basis for this certification of precompliance as specified in paragraph (b)(2) of this section;

(viii) Locations where the record for the facility can be viewed and copied by interested parties. These records and locations shall at a minimum include:

(A) The administrative record kept by the Agency office where the supporting documentation was submitted or another location designated by the Director; and

(B) The BIF correspondence file kept at the facility site where the device is located. The correspondence file must include all correspondence between the facility and the Director, State and local regulatory officials, including copies of all certifications and notifications, such as the precompliance certification, precompliance public notice, notice of compliance testing, compliance test report, compliance certification, time extension requests and approvals or denials, enforcement notifications of violations, and copies of EPA and State site visit reports submitted to the owner or operator.

(ix) Notification of the establishment of a facility mailing list whereby interested parties shall notify the Agency that they wish to be placed on the mailing list to receive future information and notices about this facility; and

(x) Location (mailing address) of the applicable EPA Regional Office, Hazardous Waste Division, where further information can be obtained on EPA regulation of hazardous waste burning.

(7) *Monitoring other operating parameters.* When the monitoring systems for the operating parameters listed in paragraphs (c)(1) (v through xii) of this section are installed and operating in conformance with vendor specifications or (for CO, HC, and oxygen) specifications provided by appendix IX of this part, as appropriate, the parameters shall be continuously monitored and records shall be maintained in the operating record.

(8) *Revised certification of precompliance.* The owner or operator may revise at any time the information and operating conditions documented under paragraphs (b)(2) and (b)(3) of this section in the certification of precompliance by submitting a revised certification of precompliance under procedures provided by those paragraphs.

(i) The public notice requirements of paragraph (b)(6) of this section do not apply to recertifications.

(ii) The owner and operator must operate the facility within the limits es-

published for the operating parameters under paragraph (b)(3) of this section until a revised certification is submitted under this paragraph or a certification of compliance is submitted under paragraph (c) of this section.

(9) *Certification of precompliance statement.* The owner or operator must include the following signed statement with the certification of precompliance submitted to the Director:

"I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information and supporting documentation. Copies of all emissions tests, dispersion modeling results and other information used to determine conformance with the requirements of § 266.103(b) are available at the facility and can be obtained from the facility contact person listed above. Based on my inquiry of the person or persons who manages the facility, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also acknowledge that the operating limits established in this certification pursuant to § 266.103(b) (3) and (4) are enforceable limits at which the facility can legally operate during interim status until: (1) A revised certification of precompliance is submitted, (2) a certification of compliance is issued, or (3) an operating permit is issued."

(c) *Certification of compliance.* The owner or operator shall conduct emissions testing to document compliance with the emissions standards of §§ 266.104 (b) through (e), 266.105, 266.106, 266.107, and paragraph (a)(5)(i)(D) of this section, under the procedures prescribed by this paragraph, except under extensions of time provided by paragraph (c)(7). Based on the compliance test, the owner or operator shall submit to the Director on or before August 21, 1992 a complete and accurate "Certification of compliance" (under paragraph (c)(4) of this section) with those emission standards establishing limits on the operating parameters specified in paragraph (c)(1).

(1) *Limits on operating conditions.* The owner or operator shall establish limits on the following parameters based on

operations during the compliance test (under procedures prescribed in paragraph (c)(4)(iv) of this section) or as otherwise specified and include these limits with the certification of compliance. The boiler or industrial furnace must be operated in accordance with these operating limits and the applicable emissions standards of §§ 266.104(b) through (e), 266.105, 266.106, 266.107, and 266.103(a)(5)(i)(D) at all times when there is hazardous waste in the unit.

(i) Feed rate of total hazardous waste and (unless complying with the Tier I or adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under § 266.107(b) or (e)), pumpable hazardous waste;

(ii) Feed rate of each metal in the following feedstreams:

(A) Total feedstreams, except that:

(1) Facilities that comply with Tier I or Adjusted Tier I metals feed rate screening limits may set their operating limits at the metals feed rate screening limits determined under § 266.106(b) or (e); and

(2) Industrial furnaces that must comply with the alternative metals implementation approach under paragraph (c)(3)(ii) of this section must specify limits on the concentration of each metal in the collected particulate matter in lieu of feed rate limits for total feedstreams;

(B) Total hazardous waste feed (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e)); and

(C) Total pumpable hazardous waste feed (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e)).

(iii) Total feed rate of chlorine and chloride in total feed streams, except that facilities that comply with Tier I or Adjusted Tier I feed rate screening limits may set their operating limits at the total chlorine and chloride feed rate screening limits determined under § 266.107(b)(1) or (e);

(iv) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light-weight aggregate kilns is not limited;

(v) Carbon monoxide concentration, and where required, hydrocarbon con-

centration in stack gas. When complying with the CO controls of § 266.104(b), the CO limit is 100 ppmv, and when complying with the HC controls of § 266.104(c), the HC limit is 20 ppmv. When complying with the CO controls of § 266.104(c), the CO limit is established based on the compliance test;

(vi) Maximum production rate of the device in appropriate units when producing normal product, unless complying with the Tier I or Adjusted Tier I feed rate screening limits for chlorine under § 266.107(b)(1) or (e) and for all metals under § 266.106(b) or (e), and the uncontrolled particulate emissions do not exceed the standard under § 266.105;

(vii) Maximum combustion chamber temperature where the temperature measurement is as close to the combustion zone as possible and is upstream of any quench water injection (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e));

(viii) Maximum flue gas temperature entering a particulate matter control device (unless complying with Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under § 266.107(b) or (e));

(ix) For systems using wet scrubbers, including wet ionizing scrubbers (unless complying with Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b)(1) or (e));

(A) Minimum liquid to flue gas ratio;

(B) Minimum scrubber blowdown from the system or maximum suspended solids content of scrubber water; and

(C) Minimum pH level of the scrubber water;

(x) For systems using venturi scrubbers, the minimum differential gas pressure across the venturi (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under § 266.107(b)(1) or (e));

(xi) For systems using dry scrubbers (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed

rate screening limits under § 266.107(b)(1) or (e));

(A) Minimum caustic feed rate; and

(B) Maximum flue gas flow rate;

(xii) For systems using wet ionizing scrubbers or electrostatic precipitators (unless complying with the Tier I or Adjusted Tier I metals feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under § 266.107(b)(1) or (e));

(A) Minimum electrical power in kilovolt amperes (kVA) to the precipitator plates; and

(B) Maximum flue gas flow rate;

(xiii) For systems using fabric filters (baghouses), the minimum pressure drop (unless complying with the Tier I or Adjusted Tier I metal feed rate screening limits under § 266.106(b) or (e) and the total chlorine and chloride feed rate screening limits under § 266.107(b)(1) or (e)).

(2) *Prior notice of compliance testing.*

At least 30 days prior to the compliance testing required by paragraph (c)(3) of this section, the owner or operator shall notify the Director and submit the following information:

(1) General facility information including:

(A) EPA facility ID number;

(B) Facility name, contact person, telephone number, and address;

(C) Person responsible for conducting compliance test, including company name, address, and telephone number, and a statement of qualifications;

(D) Planned date of the compliance test;

(1) Specific information on each device to be tested including:

(A) Description of boiler or industrial furnace;

(B) A scaled plot plan showing the entire facility and location of the boiler or industrial furnace;

(C) A description of the air pollution control system;

(D) Identification of the continuous emission monitors that are installed, including:

(1) Carbon monoxide monitor;

(2) Oxygen monitor;

(3) Hydrocarbon monitor, specifying the minimum temperature of the system and, if the temperature is less than 150 °C, an explanation of why a

heated system is not used (see paragraph (c)(5) of this section) and a brief description of the sample gas conditioning system;

(E) Indication of whether the stack is shared with another device that will be in operation during the compliance test;

(F) Other information useful to an understanding of the system design or operation.

(iii) Information on the testing planned, including a complete copy of the test protocol and Quality Assurance/Quality Control (QA/QC) plan, and a summary description for each test providing the following information at a minimum:

(A) Purpose of the test (e.g., demonstrate compliance with emissions of particulate matter); and

(B) Planned operating conditions, including levels for each pertinent parameter specified in paragraph (c)(1) of this section.

(3) *Compliance testing*—(i) *General*. Compliance testing must be conducted under conditions for which the owner or operator has submitted a certification of precompliance under paragraph (b) of this section and under conditions established in the notification of compliance testing required by paragraph (c)(2) of this section. The owner or operator may seek approval on a case-by-case basis to use compliance test data from one unit in lieu of testing a similar onsite unit. To support the request, the owner or operator must provide a comparison of the hazardous waste burned and other feedstreams, and the design, operation, and maintenance of both the tested unit and the similar unit. The Director shall provide a written approval to use compliance test data in lieu of testing a similar unit if he finds that the hazardous wastes, the devices, and the operating conditions are sufficiently similar, and the data from the other compliance test is adequate to meet the requirements of § 266.103(c).

(ii) *Special requirements for industrial furnaces that recycle collected PM*. Owners and operators of industrial furnaces that recycle back into the furnace particulate matter (PM) from the air pollution control system must comply with one of the following procedures

for testing to determine compliance with the metals standards of § 266.106(c) or (d):

(A) The special testing requirements prescribed in "Alternative Method for Implementing Metals Controls" in appendix IX of this part; or

(B) Stack emissions testing for a minimum of 6 hours each day while hazardous waste is burned during incineration status. The testing must be conducted when burning normal hazardous waste for that day at normal feed rates for that day and when the air pollution control system is operated under normal conditions. During interim status, hazardous waste analysis for metals content must be sufficient for the owner or operator to determine if changes in metals content may affect the ability of the facility to meet the metals emissions standards established under § 266.106(c) or (d). Under this option, operating limits (under paragraph (c)(1) of this section) must be established during compliance testing under the following parameters:

(1) Feed rate of total hazardous waste;

(2) Total feed rate of chlorine and chloride in total feed streams;

(3) Total feed rate of ash in total feed streams, except that the ash feed rate for cement kilns and light-weight aggregate kilns is not limited;

(4) Carbon monoxide concentration, and where required, hydrocarbon concentration in stack gas;

(5) Maximum production rate of the device in appropriate units when producing normal product; or

(C) Conduct compliance testing to determine compliance with the metals standards to establish limits on the operating parameters of paragraph (c)(1) of this section only after the kiln system has been conditioned to enable it to reach equilibrium with respect to metals fed into the system and metals emissions. During conditioning, hazardous waste and raw materials having the same metals content as will be fed during the compliance test must be fed at the feed rates that will be fed during the compliance test.

(iii) *Conduct of compliance testing*. (A) If compliance with all applicable emissions standards of § 266.104 through

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266.107 is not demonstrated simultaneously during a set of test runs, the operating conditions of additional test runs required to demonstrate compliance with remaining emissions standards must be as close as possible to the original operating conditions.

(B) Prior to obtaining test data for purposes of demonstrating compliance with the applicable emissions standards of §§ 266.104 through 266.107 or establishing limits on operating parameters under this section, the facility must operate under compliance test conditions for a sufficient period to reach steady-state operations. Industrial furnaces that recycle collected particulate matter back into the furnace and that comply with paragraphs (c)(3)(i)(A) or (B) of this section, however, need not reach steady state conditions with respect to the flow of metals in the system prior to beginning compliance testing for metals.

(C) Compliance test data on the level of an operating parameter for which a limit must be established in the certification of compliance must be obtained during emissions sampling for the pollutant(s) (i.e., metals, PM, HCl/Cl₂, organic compounds) for which the parameter must be established as specified by paragraph (c)(1) of this section. (4) *Certification of compliance*. Within 90 days of completing compliance testing, the owner or operator must certify to the Director compliance with the emissions standards of §§ 266.104 (b), (c), and (e), 266.105, 266.106, 266.107, and paragraph (a)(5)(i)(D) of this section. The certification of compliance must include the following information:

(i) General facility and testing information including:

(A) EPA facility ID number;

(B) Facility name, contact person, telephone number, and address;

(C) Person responsible for conducting compliance testing, including company name, address, and telephone number, and a statement of qualifications;

(D) Date(s) of each compliance test;

(E) Description of boiler or industrial furnace tested;

(F) Person responsible for quality assurance/quality control (QA/QC), title, and telephone number, and statement that procedures prescribed in the QA/QC plan submitted under

§ 266.103(c)(2)(iii) have been followed, or a description of any changes and an explanation of why changes were necessary.

(G) Description of any changes in the unit configuration prior to or during testing that would alter any of the information submitted in the prior notice of compliance testing under paragraph (c)(2) of this section, and an explanation of why the changes were necessary.

(H) Description of any changes in the planned test conditions prior to or during the testing that alter any of the information submitted in the prior notice of compliance testing under paragraph (c)(2) of this section, and an explanation of why the changes were necessary; and

(I) The complete report on results of emissions testing.

(ii) Specific information on each test including:

(A) Purpose(s) of test (e.g., demonstrate conformance with the emissions limits for particulate matter, metals, HCl, Cl₂, and CO).

(B) Summary of test results for each run and for each test including the following information:

(1) Date of run;

(2) Duration of run;

(3) Time-weighted average and highest hourly rolling average CO level for each run and for the test;

(4) Highest hourly rolling average HCl level, if HCl monitoring is required for each run and for the test;

(5) If dioxin and furan testing is required under § 266.104(e), time-weighted average emissions for each run and for the test of chlorinated dioxin and furan emissions, and the predicted maximum annual average ground level concentration of the toxicity equivalency factor;

(6) Time-weighted average particulate matter emissions for each run and for the test;

(7) Time-weighted average HCl and Cl₂ emissions for each run and for the test;

(8) Time-weighted average emissions for the metals subject to regulation under § 266.106 for each run and for the test; and

(9) QA/QC results.

(iii) Comparison of the actual emissions during each test with the emis-

slons limits prescribed by §§ 266.104 (b), (c), and (e), 266.106, 266.106, and 266.107 and established for the facility in the certification of precompliance under paragraph (b) of this section.

(iv) Determination of operating limits based on all valid runs of the compliance test for each applicable parameter listed in paragraph (c)(1) of this section using either of the following procedures:

(A) *Instantaneous limits.* A parameter may be measured and recorded on an instantaneous basis (i.e., the value that occurs at any time) and the operating limit specified as the time-weighted average during all runs of the compliance test; or

(B) *Hourly rolling average basis.* (1) The limit for a parameter may be established and continuously monitored on an hourly rolling average basis defined as follows:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(ii) An hourly rolling average is the arithmetic mean of the 60 most recent 1-minute average values recorded by the continuous monitoring system.

(2) The operating limit for the parameter shall be established based on compliance test data as the average over all test runs of the highest hourly rolling average value for each run.

(C) *Rolling average limits for carcinogenic metals and lead.* Feed rate limits for the carcinogenic metals (i.e., arsenic, beryllium, cadmium and chromium) and lead may be established either on an hourly rolling average basis as prescribed by paragraph (c)(4)(iv)(B) of this section or on (up to) a 24 hour rolling average basis. If the owner or operator elects to use an averaging period from 2 to 24 hours:

(1) The feed rate of each metal shall be limited at any time to ten times the feed rate that would be allowed on a hourly rolling average basis;

(2) The continuous monitor shall meet the following specifications:

(i) A continuous monitor is one which continuously samples the regulated parameter without interruption, and

evaluates the detector response at least once each 15 seconds, and computes and records the average value at least every 60 seconds.

(ii) The rolling average for the selected averaging period is defined as arithmetic mean of one hour block averages for the averaging period. A one hour block average is the arithmetic mean of the one minute averages recorded during the 60-minute period beginning at one minute after the beginning of preceding clock hour; and

(3) The operating limit for the feed rate of each metal shall be established based on compliance test data as the average over all test runs of the highest hourly rolling average feed rate for each run.

(D) *Feed rate limits for metals, total chloride and chlorine, and ash.* Feed rate limits for metals, total chlorine and chloride, and ash are established and monitored by knowing the concentration of the substance (i.e., metals, chloride/chlorine, and ash) in each feedstream and the flow rate of the feedstream. To monitor the feed rate of these substances, the flow rate of each feedstream must be monitored under the continuous monitoring requirements of paragraphs (c)(4)(iv) (A) through (C) of this section.

(v) *Certification of compliance statement.* The following statement shall accompany the certification of compliance:

"I certify under penalty of law that this information was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gathered and evaluated the information and supporting documentation. Copies of all emissions tests, dispersion modeling results and other information used to determine conformance with the requirements of § 266.103(c) are available at the facility and can be obtained from the facility contact person listed above. Based on my inquiry of the person or persons who manage the facility, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

I also acknowledge that the operating conditions established in this certification pursuant to § 266.103(c)(4)(iv) are enforceable

limits at which the facility can legally operate during interim status until a revised certification of compliance is submitted."

(5) *Special requirements for HC monitoring systems.* When an owner or operator is required to comply with the hydrocarbon (HC) controls provided by § 266.104(c) or paragraph (a)(5)(i)(D) of this section, a conditioned gas monitoring system may be used in conformance with specifications provided in appendix IX of this part provided that the owner or operator submits a certification of compliance without using extensions of time provided by paragraph (c)(7) of this section.

(6) *Special operating requirements for industrial furnaces that recycle collected PM.* Owners and operators of industrial furnaces that recycle back into the furnace particulate matter (PM) from the air pollution control system must:

(i) When complying with the requirements of paragraph (c)(3)(i)(A) of this section, comply with the operating requirements prescribed in "Alternative Method to Implement the Metals Controls" in appendix IX of this part; and

(ii) When complying with the requirements of paragraph (c)(3)(i)(B) of this section, comply with the operating requirements prescribed by that paragraph.

(7) *Extensions of time.* (i) If the owner or operator does not submit a complete certification of compliance for all of the applicable emissions standards of §§ 266.104, 266.105, 266.106, and 266.107 by August 21, 1992, he/she must either:

(A) Stop burning hazardous waste and begin closure activities under paragraph (i) of this section for the hazardous waste portion of the facility; or

(B) Limit hazardous waste burning only for purposes of compliance testing (and pretesting to prepare for compliance testing) a total period of 720 hours for the period of time beginning August 21, 1992, submit a notification to the Director by August 21, 1992 stating that the facility is operating under restricted interim status and intends to resume burning hazardous waste, and submit a complete certification of compliance by August 23, 1993; or

(C) Obtain a case-by-case extension of time under paragraph (c)(7)(ii) of this section.

(ii) The owner or operator may request a case-by-case extension of time to extend any time limit provided by paragraph (c) of this section if compliance with the time limit is not practicable for reasons beyond the control of the owner or operator.

(A) In granting an extension, the Director may apply conditions as the facts warrant to ensure timely compliance with the requirements of this section and that the facility operates in a manner that does not pose a hazard to human health and the environment;

(B) When an owner or operator requests an extension of time to enable the facility to comply with the alternative hydrocarbon provisions of § 266.104(f) and obtain a RCRA operating permit because the facility cannot meet the HC limit of § 266.104(c) of this chapter:

(i) The Director shall, in considering whether to grant the extension:

(i) Determine whether the owner and operator have submitted in a timely manner a complete part B permit application that includes information required under § 270.22(b) of this chapter; and

(ii) Consider whether the owner and operator have made a good faith effort to certify compliance with all other emission controls, including the controls on dioxins and furans of § 266.104(e) and the controls on PM, metals, and HCl/Ch.

(2) If an extension is granted, the Director shall, as a condition of the extension, require the facility to operate under flue gas concentration limits on CO and HC that, based on available information, including information in the part B permit application, are based on line CO and HC levels as defined by § 266.104(f)(1).

(8) *Revised certification of compliance.* The owner or operator may submit at any time a revised certification of compliance (recertification of compliance) under the following procedures:

(i) Prior to submittal of a revised certification of compliance, hazardous waste may not be burned for more than a total of 720 hours under operating conditions that exceed those established under a current certification of compliance, and such burning may be conducted only for purposes of deter-

mining whether the facility can operate under revised conditions and continue to meet the applicable emissions standards of §§ 266.104, 266.105, 266.106, and 266.107;

(ii) At least 30 days prior to first burning hazardous waste under operating conditions that exceed those established under a current certification of compliance, the owner or operator shall notify the Director and submit the following information:

(A) EPA facility ID number, and facility name, contact person, telephone number, and address;

(B) Operating conditions that the owner or operator is seeking to revise and description of the changes in facility design or operation that prompted the need to seek to revise the operating conditions;

(C) A determination that when operating under the revised operating conditions, the applicable emissions standards of §§ 266.104, 266.105, 266.106, and 266.107 are not likely to be exceeded. To document this determination, the owner or operator shall submit the applicable information required under paragraph (b)(2) of this section; and

(D) Complete emissions testing protocol for any pretesting and for a new compliance test to determine compliance with the applicable emissions standards of §§ 266.104, 266.105, 266.106, and 266.107 when operating under revised operating conditions. The protocol shall include a schedule of pre-testing and compliance testing. If the owner and operator revises the scheduled date for the compliance test, he/she shall notify the Director in writing at least 30 days prior to the revised date of the compliance test;

(iii) Conduct a compliance test under the revised operating conditions and the protocol submitted to the Director to determine compliance with the applicable emissions standards of §§ 266.104, 266.105, 266.106, and 266.107; and

(iv) Submit a revised certification of compliance under paragraph (c)(4) of this section.

(d) *Periodic Recertifications.* The owner or operator must conduct compliance testing and submit to the Director a recertification of compliance under provisions of paragraph (c) of this section.

tion within three years from submitting the previous certification or recertification. If the owner or operator seeks to recertify compliance under new operating conditions, he/she must comply with the requirements of paragraph (c)(8) of this section.

(e) *Noncompliance with certification schedule.* If the owner or operator does not comply with the interim status compliance schedule provided by paragraphs (b), (c), and (d) of this section, hazardous waste burning must terminate on the date that the deadline is missed, closure activities must begin under paragraph (i) of this section, and hazardous waste burning may not resume except under an operating permit issued under § 270.66 of this chapter. For purposes of compliance with the closure provisions of paragraph (i) of this section and §§ 265.112(d)(2) and 265.113 of this chapter the boiler or industrial furnace has received "the known final volume of hazardous waste" on the date that the deadline is missed.

(f) *Start-up and shut-down.* Hazardous waste (except waste fed solely as an ingredient under the Tier I (or adjusted Tier I) feed rate screening limits for metals and chloride/chlorine) must not be fed into the device during start-up and shut-down of the boiler or industrial furnace, unless the device is operating within the conditions of operation specified in the certification of compliance.

(g) *Automatic waste feed cutoff.* During the compliance test required by paragraph (c)(3) of this section, and upon certification of compliance under paragraph (c) of this section, a boiler or industrial furnace must be operated with a functioning system that automatically cuts off the hazardous waste feed when the applicable operating conditions specified in paragraphs (c)(1) and (v) through (xii) of this section deviate from those established in the certification of compliance. In addition:

(1) To minimize emissions of organic compounds, the minimum combustion chamber temperature (or the indicator of combustion chamber temperature) that occurred during the compliance test must be maintained while hazardous waste or hazardous waste residues remain in the combustion chamber.

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with the minimum temperature during the compliance test defined as either:

(i) If compliance with the combustion chamber temperature limit is based on a hourly rolling average, the minimum temperature during the compliance test is considered to be the average over all runs of the lowest hourly rolling average for each run; or

(ii) If compliance with the combustion chamber temperature limit is based on an instantaneous temperature measurement, the minimum temperature during the compliance test is considered to be the time-weighted average temperature during all runs of the test; and

(2) Operating parameters limited by the certification of compliance must continue to be monitored during the cutoff, and the hazardous waste feed shall not be restarted until the levels of those parameters comply with the limits established in the certification of compliance.

(h) *Fugitive emissions.* Fugitive emissions must be controlled by:

(1) Keeping the combustion zone totally sealed against fugitive emissions; or

(2) Maintaining the combustion zone pressure lower than atmospheric pressure; or

(3) An alternate means of control that the owner or operator can demonstrate provide fugitive emissions control equivalent to maintenance of combustion zone pressure lower than atmospheric pressure. Support for such demonstration shall be included in the operating record.

(i) *Changes.* A boiler or industrial furnace must cease burning hazardous waste when changes in combustion properties, or feed rates of the hazardous waste, or other fuels, or industrial furnace feedstocks, or changes in the boiler or industrial furnace design or operating conditions deviate from the limits specified in the certification of compliance.

(j) *Monitoring and Inspections.* (1) The owner or operator must monitor and record the following, at a minimum, while burning hazardous waste:

(i) Feed rates and composition of hazardous waste, other fuels, and industrial furnace feed stocks, and feed rates of ash, metals, and total chloride

and chlorine as necessary to ensure conformance with the certification of precompliance or certification of compliance;

(ii) Carbon monoxide (CO), oxygen, and if applicable, hydrocarbons (HC), on a continuous basis at a common point in the boiler or industrial furnace downstream of the combustion zone and prior to release of stack gases to the atmosphere in accordance with the operating limits specified in the certification of compliance. CO, HC, and oxygen monitors must be installed, operated, and maintained in accordance with methods specified in appendix IX of this part.

(iii) Upon the request of the Director, sampling and analysis of the hazardous waste (and other fuels and industrial furnace feed stocks as appropriate) and the stack gas emissions must be conducted to verify that the operating conditions established in the certification of precompliance or certification of compliance achieve the applicable standards of §§ 266.104, 266.105, 266.106, and 266.107.

(2) The boiler or industrial furnace and associated equipment (pumps, valves, pipes, fuel storage tanks, etc.) must be subjected to thorough visual inspection when they contain hazardous waste, at least daily for leaks, spills, fugitive emissions, and signs of tampering.

(3) The automatic hazardous waste feed cutoff system and associated alarms must be tested at least once every 7 days when hazardous waste is burned to verify operability, unless the owner or operator can demonstrate that weekly inspections will unduly restrict or upset operations and that less frequent inspections will be adequate. Support for such demonstration shall be included in the operating record. At a minimum, operational testing must be conducted at least once every 30 days.

(4) These monitoring and inspection data must be recorded and the records must be placed in the operating log.

(k) *Recordkeeping.* The owner or operator must keep in the operating record of the facility all information and data required by this section until closure of the boiler or industrial furnace unit.

(1) *Closure.* At closure, the owner or operator must remove all hazardous waste and hazardous waste residues (including, but not limited to, ash, scrubber waters, and scrubber sludges) from the boiler or industrial furnace and must comply with §§ 265.111-265.115 of this chapter.

[66 FR 7208, Feb. 21, 1991; 56 FR 32689, July 17, 1991, as amended at 56 FR 42512, 42514, Aug. 27, 1991; 57 FR 38564, Aug. 25, 1992; 57 FR 45000, Sept. 30, 1992; 60 FR 33913, June 29, 1995]

§ 266.104 Standards to control organic emissions.

(a) *DRE standard*—(1) *General.* Except as provided in paragraph (a)(3) of this section, a boiler or industrial furnace burning hazardous waste must achieve a destruction and removal efficiency (DRE) of 99.99% for all organic hazardous constituents in the waste feed. To demonstrate conformance with this requirement, 99.99% DRE must be demonstrated during a trial burn for each principal organic hazardous constituent (POHC) designated (under paragraph (a)(2) of this section) in its permit for each waste feed. DRE is determined for each POHC from the following equation:

$$DRE = \left[1 - \frac{W_{out}}{W_{in}} \right] \times 100$$

where:

W_{in} = Mass feed rate of one principal organic hazardous constituent (POHC) in the hazardous waste fired to the boiler or industrial furnace; and
 W_{out} = Mass emission rate of the same POHC present in stack gas prior to release to the atmosphere.

(2) *Designation of POHCs.* Principal organic hazardous constituents (POHCs) are those compounds for which compliance with the DRE requirements of this section shall be demonstrated in a trial burn in conformance with procedures prescribed in § 270.66 of this chapter. One or more POHCs shall be designated by the Director for each waste feed to be burned. POHCs shall be designated based on the degree of difficulty of destruction of the organic constituents in the waste and on their concentrations or mass in the waste feed considering the results

of waste analyses submitted with part B of the permit application. POHCs are most likely to be selected from among those compounds listed in part 261, appendix VIII of this chapter that are also present in the normal waste feed. However, if the applicant demonstrates to the Regional Administrator's satisfaction that a compound not listed in appendix VIII or not present in the normal waste feed is a suitable indicator of compliance with the DRE requirements of this section, that compound may be designated as a POHC. Such POHCs need not be toxic or organic compounds.

(3) *Dioxin-listed waste.* A boiler or industrial furnace burning hazardous waste containing (or derived from) EPA Hazardous Wastes Nos. F020, F021, F022, F023, F026, or F027 must achieve a destruction and removal efficiency (DRE) of 99.9999% for each POHC designated (under paragraph (a)(2) of this section) in its permit. This performance must be demonstrated on POHCs that are more difficult to burn than tetra-, penta-, and hexachlorodibenzo-p-dioxins and dibenzofurans. DRE is determined for each POHC from the equation in paragraph (a)(1) of this section. In addition, the owner or operator of the boiler or industrial furnace must notify the Director of intent to burn EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027.

(4) *Automatic waiver of DRE trial burn.* Owners and operators of boilers operated under the special operating requirements provided by § 266.110 are considered to be in compliance with the DRE standard of paragraph (a)(1) of this section and are exempt from the DRE trial burn.

(5) *Low risk waste.* Owners and operators of boilers or industrial furnaces that burn hazardous waste in compliance with the requirements of § 266.109(a) are considered to be in compliance with the DRE standard of paragraph (a)(1) of this section and are exempt from the DRE trial burn.

(b) *Carbon monoxide standard.* (1) Except as provided in paragraph (c) of this section, the stack gas concentration of carbon monoxide (CO) from a boiler or industrial furnace burning hazardous waste cannot exceed 100 ppmv on an hourly rolling average

basis (i.e., over any 60 minute period), continuously corrected to 7 percent oxygen, dry gas basis.

(2) CO and oxygen shall be continuously monitored in conformance with "Performance Specifications for Continuous Emission Monitoring of Carbon Monoxide and Oxygen for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste" in appendix IX of this part.

(3) Compliance with the 100 ppmv CO limit must be demonstrated during the trial burn (for new facilities or an interim status facility applying for a permit) or the compliance test (for interim status facilities). To demonstrate compliance, the highest hourly rolling average CO level during any valid run of the trial burn or compliance test must not exceed 100 ppmv.

(c) *Alternative carbon monoxide standard.* (1) The stack gas concentration of carbon monoxide (CO) from a boiler or industrial furnace burning hazardous waste may exceed the 100 ppmv limit provided that stack gas concentrations of hydrocarbons (HC) do not exceed 20 ppmv, except as provided by paragraph (f) of this section for certain industrial furnaces.

(2) HC limits must be established under this section on an hourly rolling average basis (i.e., over any 60 minute period), reported as propane, and continuously corrected to 7 percent oxygen, dry gas basis.

(3) HC shall be continuously monitored in conformance with "Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste" in appendix IX of this part. CO and oxygen shall be continuously monitored in conformance with paragraph (b)(2) of this section.

(4) The alternative CO standard is established based on CO data during the trial burn (for a new facility) and the compliance test (for an interim status facility). The alternative CO standard is the average over all valid runs of the highest hourly average CO level for each run. The CO limit is implemented on an hourly rolling average basis, and continuously corrected to 7 percent oxygen, dry gas basis.

(d) *Special requirements for furnaces.* Owners and operators of industrial furnaces (e.g., kilns, cupolas) that feed hazardous waste for a purpose other than solely as an ingredient (see § 266.103(a)(5)(ii)) at any location other than the end where products are normally discharged and where fuels are normally fired must comply with the hydrocarbon limits provided by paragraphs (c) or (f) of this section irrespective of whether stack gas CO concentrations meet the 100 ppmv limit of paragraph (b) of this section.

(e) *Controls for dioxins and furans.* Owners and operators of boilers and industrial furnaces that are equipped with a dry particulate matter control device that operates within the temperature range of 450-750 °F, and industrial furnaces operating under an alternative hydrocarbon limit established under paragraph (f) of this section must conduct a site-specific risk assessment as follows to demonstrate that emissions of chlorinated dibenzop-dioxins and dibenzofurans do not result in an increased lifetime cancer risk to the hypothetical maximum exposed individual (MEI) exceeding 1 in 100,000:

(1) During the trial burn (for new facilities or an interim status facility applying for a permit) or compliance test (for interim status facilities), determine emission rates of the tetra-octa congeners of chlorinated dibenzop-dioxins and dibenzofurans (CDDs/CDFs) using Method 23, "Determination of Polychlorinated Dibenzop-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) from Stationary Sources", in appendix IX of this part;

(2) Estimate the 2,3,7,8-TCDD toxicity equivalence of the tetra-octa CDDs/CDFs congeners using "Procedures for Estimating the Toxicity Equivalence of Chlorinated Dibenzop-Dioxin and Dibenzofuran Congeners" in appendix IX of this part. Multiply the emission rates of CDD/CDF congeners with a toxicity equivalence greater than zero (see the procedure) by the calculated toxicity equivalence factor to estimate the equivalent emission rate of 2,3,7,8-TCDD;

(3) Conduct dispersion modeling using methods recommended in appen-

dix W of part 51 of this chapter ("Guideline on Air Quality Models (Revised)" (1986) and its supplements), the "Hazardous Waste Combustion Air Quality Screening Procedure", provided in appendix IX of this part, or in Screening Procedures for Estimating the Air Quality Impact of Stationary Sources, Revised (Incorporated by reference in § 260.11) to predict the maximum annual average off-site ground level concentration of 2,3,7,8-TCDD equivalents determined under paragraph (a)(2) of this section. The maximum annual average concentration must be used when a person resides on-site; and

(4) The ratio of the predicted maximum annual average ground level concentration of 2,3,7,8-TCDD equivalents to the risk-specific dose for 2,3,7,8-TCDD provided in appendix V of this part (2.2 X 10⁻⁷) shall not exceed 1.0.

(f) Monitoring CO and HC in the by-pass duct of a cement kiln. Cement kilns may comply with the carbon monoxide and hydrocarbon limits provided by paragraphs (b), (c), and (d) of this section by monitoring in the by-pass duct provided that:

- (1) Hazardous waste is fired only into the kiln and not at any location downstream from the kiln exit relative to the direction of gas flow; and
- (2) The by-pass duct diverts a minimum of 10% of kiln off-gas into the duct.

(g) Use of emissions test data to demonstrate compliance and establish operating limits. Compliance with the requirements of this section must be demonstrated simultaneously by emissions testing or during separate runs under identical operating conditions. Further, data to demonstrate compliance with the CO and HC limits of this section or to establish alternative CO or HC limits under this section must be obtained during the time that DRE testing, and where applicable, CDD/CDF testing under paragraph (e) of this section and comprehensive organic emissions testing under paragraph (f) is conducted.

(h) Enforcement. For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under § 266.102) will be regarded as compliance with this section.

However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 270.41 of this chapter.

(56 FR 7208, Feb. 21, 1991; 56 FR 32689, July 17, 1991, as amended at 57 FR 38563, Aug. 25, 1992; 58 FR 38883, July 20, 1993; 60 FR 33914, June 29, 1995)

§ 266.106 Standards to control particulate matter.

(a) A boiler or industrial furnace burning hazardous waste may not emit particulate matter in excess of 180 milligrams per dry standard cubic meter (0.08 grains per dry standard cubic foot) after correction to a stack gas concentration of 7% oxygen, using procedures prescribed in 40 CFR part 60, appendix A, methods 1 through 5, and appendix IX of this part.

(b) An owner or operator meeting the requirements of § 266.109(b) for the low risk waste exemption is exempt from the particulate matter standard.

(c) For the purposes of permit enforcement, compliance with the operating requirements specified in the permit (under § 266.102) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 270.41 of this chapter.

§ 266.106 Standards to control metals emissions.

(a) General. The owner or operator must comply with the metals standards provided by paragraphs (b), (c), (d), (e), or (f) of this section for each metal listed in paragraph (b) of this section that is present in the hazardous waste at detectable levels using analytical procedures specified in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846), incorporated by reference in § 260.11 of this chapter.

(b) Tier I feed rate screening limits. Feed rate screening limits for metals are specified in appendix I of this part as a function of terrain-adjusted effec-

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tive stack height and terrain and land use in the vicinity of the facility. Criteria for facilities that are not eligible to comply with the screening limits are provided in paragraph (b)(7) of this section.

(1) Noncarcinogenic metals. The feed rates of antimony, barium, lead, mercury, thallium, and silver in all feed streams, including hazardous waste, fuels, and industrial furnace feed stocks shall not exceed the screening limits specified in appendix I of this part.

(i) The feed rate screening limits for antimony, barium, mercury, thallium, and silver are based on either:

- (A) An hourly rolling average as defined in § 266.102(e)(6)(1)(B); or
- (B) An instantaneous limit not to be exceeded at any time.

(ii) The feed rate screening limit for lead is based on one of the following:

- (A) An hourly rolling average as defined in § 266.102(e)(6)(1)(B);
- (B) An averaging period of 2 to 24 hours as defined in § 266.102(e)(6)(1)(i) with an instantaneous feed rate limit not to exceed 10 times the feed rate that would be allowed on an hourly rolling average basis; or
- (C) An instantaneous limit not to be exceeded at any time.

(2) Carcinogenic metals. (i) The feed rates of arsenic, cadmium, beryllium, and chromium in all feed streams, including hazardous waste, fuels, and industrial furnace feed stocks shall not exceed values derived from the screening limits specified in appendix I of this part. The feed rate of each of these metals is limited to a level such that the sum of the ratios of the actual feed rate to the feed rate screening limit specified in appendix I shall not exceed 1.0, as provided by the following equation:

$$\sum_{i=1}^n \frac{AFR_{i,j}}{FRSL_{i,j}} \leq 1.0$$

where:

n=number of carcinogenic metals
AFR_{i,j}=actual feed rate to the device for metal "i";

FRSL_{i,j}=feed rate screening limit provided by appendix I of this part for metal "i".

(ii) The feed rate screening limits for the carcinogenic metals are based on either:

- (A) An hourly rolling average; or
 - (B) An averaging period of 2 to 24 hours as defined in § 266.102(e)(6)(1)(i) with an instantaneous feed rate limit not to exceed 10 times the feed rate that would be allowed on an hourly rolling average basis.
- (3) TESH. (i) The terrain-adjusted effective stack height is determined according to the following equation:

$$TESH = H_a + H_i - T_r$$

where:

H_a=Actual physical stack height

H_i=Plume rise as determined from appendix VI of this part as a function of stack flow rate and stack gas exhaust temperature.

T_r=Terrain rise within five kilometers of the stack.

(ii) The stack height (H_a) may not exceed good engineering practice as specified in 40 CFR 51.100(ii).

(iii) If the TESH for a particular facility is not listed in the table in the appendices, the nearest lower TESH listed in the table shall be used. If the TESH is four meters or less, a value of four meters shall be used.

(4) Terrain type. The screening limits are a function of whether the facility is located in noncomplex or complex terrain. A device located where any part of the surrounding terrain within 5 kilometers of the stack equals or exceeds the elevation of the physical stack height (H_a) is considered to be in complex terrain and the screening limits measurements are to be made from U.S. Geological Survey 7.5-minute topographic maps of the area surrounding the facility.

(5) Land use. The screening limits are a function of whether the facility is located in an area where the land use is urban or rural. To determine whether land use in the vicinity of the facility is urban or rural, procedures provided in appendices IX or X of this part shall be used.

(6) Multiple stacks. Owners and operators of facilities with more than one on-site stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls of metals emissions under a RCRA oper-

ating permit or interim status controls must comply with the screening limits for all such units assuming all hazardous waste is fed into the device with the worst-case stack based on dispersion characteristics. The worst-case stack is determined from the following equation as applied to each stack:

$$K = HVT$$

Where:

K=a parameter accounting for relative influence of stack height and plume rise;
H=physical stack height (meters);
V=stack gas flow rate (m³/second); and
T=exhaust temperature (°K).

The stack with the lowest value of K is the worst-case stack.

(7) *Criteria for facilities not eligible for screening limits.* If any criteria below are met, the Tier I and Tier II screening limits do not apply. Owners and operators of such facilities must comply with either the Tier III standards provided by paragraph (d) of this section or with the adjusted Tier I feed rate screening limits provided by paragraph (e) of this section.

(i) The device is located in a narrow valley less than one kilometer wide;
(ii) The device has a stack taller than 20 meters and is located such that the terrain rises to the physical height within one kilometer of the facility;
(iii) The device has a stack taller than 20 meters and is located within five kilometers of a shoreline of a large body of water such as an ocean or large lake;

(iv) The physical stack height of any stack is less than 2.5 times the height of any building within five building heights or five projected building widths of the stack and the distance from the stack to the closest boundary is within five building heights or five projected building widths of the associated building; or

(v) The Director determines that standards based on site-specific dispersion modeling are required.

(8) *Implementation.* The feed rate of metals in each feedstream must be monitored to ensure that the feed rate screening limits are not exceeded.

(c) *Tier II emission rate screening limits.* Emission rate screening limits are specified in appendix I as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity

of the facility. Criteria for facilities that are not eligible to comply with the screening limits are provided in paragraph (b)(7) of this section.

(1) *Noncarcinogenic metals.* The emission rates of antimony, barium, lead, mercury, thallium, and silver shall not exceed the screening limits specified in appendix I of this part.

(2) *Carcinogenic metals.* The emission rates of arsenic, cadmium, beryllium, and chromium shall not exceed values derived from the screening limits specified in appendix I of this part. The emission rate of each of these metals is limited to a level such that the sum of the ratios of the actual emission rate to the emission rate screening limit specified in appendix I shall not exceed 1.0, as provided by the following equation:

$$\frac{n}{\sum} \frac{AER_n}{ERSL_n} \leq 1.0$$

where:

n=number of carcinogenic metals
AER=actual emission rate for metal "..."
ERSL=emission rate screening limit provided by appendix I of this part for metal "...".

(3) *Implementation.* The emission rate limits must be implemented by limiting feed rates of the individual metals to levels during the trial burn (for new facilities or an interim status facility applying for a permit) or the compliance test (for interim status facilities). The feed rate averaging periods are the same as provided by paragraphs (b)(1)(i) and (ii) and (b)(2)(ii) of this section. The feed rate of metals in each feedstream must be monitored to ensure that the feed rate limits for the feedstreams specified under §§ 266.102 or 266.103 are not exceeded.

(4) *Definitions and limitations.* The definitions and limitations provided by paragraph (b) of this section for the following terms also apply to the Tier II emission rate screening limits provided by paragraph (c) of this section: terrain-adjusted effective stack height, good engineering practice stack height, terrain type, land use, and criteria for facilities not eligible to use the screening limits.

ground level) concentration for each dispersion modeling to predict the maximum annual average off-site ground level concentration for each metal, and a demonstration that acceptable ambient levels are not exceeded.

(2) *Acceptable ambient levels.* Appendices IV and V of this part list the acceptable ambient levels for purposes of this rule. Reference air concentrations (RACs) are listed for the noncarcinogenic metals and 10⁻⁵ risk-specific doses (RSDs) are listed for the carcinogenic metals. The RSD for a metal is the acceptable ambient level for that metal provided that only one of the four carcinogenic metals is emitted. If more than one carcinogenic metal is emitted, the acceptable ambient level for the carcinogenic metals is a fraction of the RSD as described in paragraph (d)(3) of this section.

(3) *Carcinogenic metals.* For the carcinogenic metals, arsenic, cadmium, beryllium, and chromium, the sum of the ratios of the predicted maximum annual average off-site ground level concentrations (except that on-site concentrations must be considered if a person resides on site) to the risk-specific dose (RSD) for all carcinogenic metals emitted shall not exceed 1.0 as determined by the following equation:

$$\frac{n}{\sum} \frac{\text{Predicted Ambient Concentration}_{n10^{-5}}}{\text{Risk-Specific Dose}_{n10^{-5}}} \leq 1.0$$

where: n=number of carcinogenic metals

(4) *Noncarcinogenic metals.* For the noncarcinogenic metals, the predicted maximum annual average off-site ground level concentration for each metal shall not exceed the reference air concentration (RAC).

(5) *Multiple stacks.* Owners and operators of facilities with more than one on-site stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on metals emissions under a RCRA operating permit or interim status controls must conduct emissions testing (except that facilities complying with Adjusted Tier I controls need not conduct emis-

sions testing) and dispersion modeling to demonstrate that the aggregate emissions from all such on-site stacks do not result in an exceedance of the acceptable ambient levels.

(6) *Implementation.* Under Tier III, the metals controls must be implemented by limiting feed rates of the individual metals to levels during the trial burn (for new facilities or an interim status facility applying for a permit) or the compliance test (for interim status facilities). The feed rate averaging periods are the same as provided by paragraphs (b)(1) (i) and (ii) and (b)(2)(ii) of this section. The feed rate of metals in each feedstream must be monitored to

ensure that the feed rate limits for the feedstreams specified under § 266.102 or 266.103 are not exceeded.

(e) *Adjusted Tier I feed rate screening limits.* The owner or operator may adjust the feed rate screening limits provided by appendix I of this part to account for site-specific dispersion modeling. Under this approach, the adjusted feed rate screening limit for a metal is determined by back-calculating from the acceptable ambient level provided by appendices IV and V of this part using dispersion modeling to determine the maximum allowable emission rate. This emission rate becomes the adjusted Tier I feed rate screening limit. The feed rate screening limits for carcinogenic metals are implemented as prescribed in paragraph (b)(2) of this section.

(f) *Alternative implementation approaches.* (1) The Director may approve on a case-by-case basis approaches to implement the Tier II or Tier III metals emission limits provided by paragraphs (c) or (d) of this section alternative to monitoring the feed rate of metals in each feedstream.

(2) The emission limits provided by paragraph (d) of this section must be determined as follows:

(i) For each noncarcinogenic metal, by back-calculating from the RAC provided in appendix IV of this part to determine the allowable emission rate for each metal using the dilution factor for the maximum annual average ground level concentration predicted by dispersion modeling in conformance with paragraph (h) of this section; and

(ii) For each carcinogenic metal by: (A) Back-calculating from the RSD provided in appendix V of this part to determine the allowable emission rate for each metal if that metal were the only carcinogenic metal emitted using the dilution factor for the maximum annual average ground level concentration predicted by dispersion modeling in conformance with paragraph (h) of this section; and

(B) If more than one carcinogenic metal is emitted, selecting an emission limit for each carcinogenic metal not to exceed the emission rate determined by paragraph (ix)(2)(i)(A) of this section such that the sum for all carcinogenic metals of the ratios of the selected

limits are specified for total chlorine in appendix II of this part as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. The feed rate of total chlorine and chloride, both organic and inorganic, in all feed streams, including hazardous waste, fuels, and industrial furnace feed stocks shall not exceed the levels specified.

(2) *Tier II emission rate screening limits.* Emission rate screening limits for HCl and Cl₂ are specified in appendix III of this part as a function of terrain-adjusted effective stack height and terrain and land use in the vicinity of the facility. The stack emission rates of HCl and Cl₂ shall not exceed the levels specified.

(3) *Definitions and limitations.* The definitions and limitations provided by § 266.106(b) for the following terms also apply to the screening limits provided by this paragraph: terrain-adjusted effective stack height, good engineering practice stack height, terrain type, land use, and criteria for facilities not eligible to use the screening limits.

(4) *Multiple stacks.* Owners and operators of facilities with more than one on-site stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on HCl or Cl₂ emissions under a RCRA operating permit or interim status control must comply with the Tier I and Tier II screening limits for those stacks assuming all hazardous waste is fed into the device with the worst-case stack based on dispersion characteristics.

(i) The worst-case stack is determined by procedures provided in § 266.106(b)(6).

(ii) Under Tier I, the total feed rate of chlorine and chloride to all subject devices shall not exceed the screening limit for the worst-case stack.

(iii) Under Tier II, the total emissions of HCl and Cl₂ from all subject stacks shall not exceed the screening limit for the worst-case stack.

(c) *Tier III site-specific risk assessments—(1) General.* Conformance with the Tier III controls must be demonstrated by emissions testing to determine the emission rate for HCl and Cl₂, air dispersion modeling to predict

the maximum annual average off-site ground level concentration for each compound, and a demonstration that acceptable ambient levels are not exceeded.

(2) *Acceptable ambient levels.* Appendix IV of this part lists the reference air concentrations (RACs) for HCl (7 micrograms per cubic meter) and Cl₂ (0.4 micrograms per cubic meter).

(3) *Multiple stacks.* Owners and operators of facilities with more than one on-site stack from a boiler, industrial furnace, incinerator, or other thermal treatment unit subject to controls on HCl or Cl₂ emissions under a RCRA operating permit or interim status control must conduct emissions testing and dispersion modeling to demonstrate that the aggregate emissions from all such on-site stacks do not result in an exceedance of the acceptable ambient levels for HCl and Cl₂.

(d) *Averaging periods.* The HCl and Cl₂ controls are implemented by limiting the feed rate of total chlorine and chloride in all feedstreams, including hazardous waste, fuels, and industrial furnace feed stocks. Under Tier I, the feed rate of total chloride and chlorine is limited to the Tier I Screening Limits. Under Tier II and Tier III, the feed rate of total chloride and chlorine is limited to the feed rates during the trial burn (for new facilities or an interim status facility applying for a permit) or the compliance test (for interim status facilities). The feed rate limits are based on either:

(1) An hourly rolling average as defined in § 266.102(e)(6); or

(2) An instantaneous basis not to be exceeded at any time.

(e) *Adjusted Tier I feed rate screening limits.* The owner or operator may adjust the feed rate screening limit provided by appendix II of this part to account for site-specific dispersion modeling. Under this approach, the adjusted feed rate screening limit is determined by back-calculating from the acceptable ambient level for Cl₂ provided by appendix IV of this part using dispersion modeling to determine the maximum allowable emission rate. This emission rate becomes the adjusted Tier I feed rate screening limit.

(f) *Emissions testing.* Emissions testing for HCl and Cl₂ shall be conducted

using the procedures described in appendix IX of this part.

(g) *Dispersion modeling.* Dispersion modeling shall be conducted according to the provisions of § 266.106(h).

(h) *Enforcement.* For the purposes of permit enforcement, comments specified in the permit (under § 266.102) will be regarded as compliance with this section. However, evidence that compliance with those permit conditions is insufficient to ensure compliance with the requirements of this section may be "information" justifying modification or revocation and re-issuance of a permit under § 270.41 of this chapter.

[56 FR 7206, Feb. 21, 1991; 56 FR 32690, July 17, 1991; 57 FR 38566, Aug. 25, 1992]

§ 266.106 Small quantity on-site burner exemption.

(a) *Exempt quantities.* Owners and operators of facilities that burn hazardous waste in an on-site boiler or industrial furnace are exempt from the requirements of this subpart provided that:

(1) The quantity of hazardous waste burned in a device for a calendar month does not exceed the limits provided in the following table based on the terrain-adjusted effective stack height as defined in § 266.106(b)(3):

EXEMPT QUANTITIES FOR SMALL QUANTITY BURNER EXEMPTION

Terrain-adjusted effective stack height of device (meters)	Allowable hazardous waste burning rate (ton/ton/month)
0 to 3.9	0
4.0 to 5.9	13
6.0 to 7.9	18
8.0 to 9.9	27

* Actual Quantity Burned_h

$$\frac{\sum}{h} \text{ Allowable Quantity Burned}_{h_i}$$

where:

n means the number of stacks;

Actual Quantity Burned means the waste quantity burned per month in device "i";

Allowable Quantity Burned means the maximum allowable exempt quantity for stack "i" from the table in (a)(1) above.

NOTE: Hazardous wastes that are subject to the special requirements for small quantity generators under § 261.5 of this chapter may be burned in an off-site device under the exemption provided by § 266.106, but must be included in the quantity determination for the exemption.

(d) *Notification requirements.* The owner or operator of facilities qualifying for the small quantity burner exemption under this section must provide a one-time signed, written notice to EPA indicating the following:

(1) The combustion unit is operating as a small quantity burner of hazardous waste;

(2) The owner and operator are in compliance with the requirements of this section; and

(3) The maximum quantity of hazardous waste that the facility may burn per month as provided by § 266.106(a)(1).

(e) *Recordkeeping requirements.* The owner or operator must maintain at the facility for at least three years sufficient records documenting compliance with the hazardous waste quantity, firing rate, and heating value limits of this section. At a minimum, these records must indicate the quantity of hazardous waste and other fuel burned in each unit per calendar month, and the heating value of the hazardous waste.

[56 FR 7208, Feb. 21, 1991; 56 FR 32690, July 17, 1991, as amended at 56 FR 42515, Aug. 27, 1991; 57 FR 38566, Aug. 25, 1992]

§ 266.109 Low risk waste exemption.

(a) *Waiver of DRE standard.* The DRE standard of § 266.104(a) does not apply if the boiler or industrial furnace is operated in conformance with (a)(1) of this section and the owner or operator demonstrates by procedures prescribed in (a)(2) of this section that the burning will not result in unacceptable adverse health effects.

(1) The device shall be operated as follows:

(i) A minimum of 50 percent of fuel fired to the device shall be fossil fuel, fuels derived from fossil fuel, tail oil, or, if approved by the Director on a case-by-case basis, other nonhazardous fuel with combustion characteristics

comparable to fossil fuel. Such fuels are termed "primary fuel" for purposes of this section. (Tail oil is a fuel derived from vegetable and rosin fatty acids.) The 50 percent primary fuel firing rate shall be determined on a total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired;

(ii) Primary fuels and hazardous waste fuels shall have a minimum as-fired heating value of 8,000 Btu/lb;

(iii) The hazardous waste is fired directly into the primary fuel flame zone of the combustion chamber; and

(iv) The device operates in conformance with the carbon monoxide controls provided by § 266.104(b)(1). Devices subject to the exemption provided by this section are not eligible for the alternative carbon monoxide controls provided by § 266.104(c).

(2) Procedures to demonstrate that the hazardous waste burning will not pose unacceptable adverse public health effects are as follows:

(i) Identify and quantify those nonmetal compounds listed in appendix VIII, part 261 of this chapter that could reasonably be expected to be present in the hazardous waste. The constituents excluded from analysis must be identified and the basis for their exclusion explained;

(ii) Calculate reasonable, worst case emission rates for each constituent identified in paragraph (a)(2)(i) of this section by assuming the device achieves 99.9 percent destruction and removal efficiency. That is, assume that 0.1 percent of the mass weight of each constituent fed to the device is emitted.

(iii) For each constituent identified in paragraph (a)(2)(i) of this section, use emissions dispersion modeling to predict the maximum annual average ground level concentration of the constituent.

(A) Dispersion modeling shall be conducted using methods specified in § 266.106(h).

(B) Owners and operators of facilities with more than one on-site stack from a boiler or industrial furnace that is exempt under this section must conduct dispersion modeling of emissions from all stacks exempt under this sec-

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§ 266.111 Standards for direct transfer.

(a) *Applicability.* The regulations in this section apply to owners and operators of boilers and industrial furnaces subject to §§ 266.102 or 266.103 if hazardous waste is directly transferred from a transport vehicle to a boiler or industrial furnace without the use of a storage unit.

(b) *Definitions.* (1) When used in this section, the following terms have the meanings given below:

Direct transfer equipment means any device (including but not limited to, such devices as piping, fittings, flanges, valves, and pumps) that is used to distribute, meter, or control the flow of hazardous waste between a container (i.e., transport vehicle) and a boiler or industrial furnace.

Container means any portable device in which hazardous waste is transported, stored, treated, or otherwise handled, and includes transport vehicles that are containers themselves (e.g., tank trucks, tanker-trailers, and rail tank cars), and containers placed on or in a transport vehicle.

(2) This section references several requirements provided in subparts 1 and 2 of parts 264 and 265. For purposes of this section, the term "tank systems" in those referenced requirements means direct transfer equipment as defined in paragraph (b)(1) of this section.

(c) *General operating requirements.* (1) No direct transfer of a pumpable hazardous waste shall be conducted from an open-top container to a boiler or industrial furnace.

(2) Direct transfer equipment used for pumpable hazardous waste shall always be closed, except when necessary to add or remove the waste, and shall not be opened, handled, or stored in a manner that may cause any rupture or leak.

(3) The direct transfer of hazardous waste to a boiler or industrial furnace shall be conducted so that it does not:

- (i) Generate extreme heat or pressure, fire, explosion, or violent reaction;
- (ii) Produce uncontrolled toxic mists, fumes, dusts, or gases in sufficient quantities to threaten human health;
- (iii) Produce uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;

(iv) Damage the structural integrity of the container or direct transfer equipment containing the waste;

(v) Adversely affect the capability of the boiler or industrial furnace to meet the standards provided by §§ 266.104 through 266.107; or

(vi) Threaten human health or the environment.

(4) Hazardous waste shall not be placed in direct transfer equipment, if it could cause the equipment or its secondary containment system to rupture, leak, corrode, or otherwise fail.

(5) The owner or operator of the facility shall use appropriate controls and practices to prevent spills and overflows from the direct transfer equipment or its secondary containment systems. These include at a minimum:

- (i) Spill prevention controls (e.g., check valves, dry discount couplings); and
- (ii) Automatic waste feed cutoff to use if a leak or spill occurs from the direct transfer equipment.

(d) *Areas where direct transfer vehicles (containers) are located.* Applying the definition of container under this section, owners and operators must comply with the following requirements:

- (1) The containment requirements of § 264.175 of this chapter;
- (2) The use and management requirements of subpart 1, part 265 of this chapter, except for §§ 265.170 and 265.174, and except that in lieu of the special requirements of § 265.176 for ignitable or reactive waste, the owner or operator may comply with the requirements for the maintenance of protective distances between the waste management area and any public ways, streets, alleys, or an adjacent property line that can be built upon as required in Tables 2-1 through 2-6 of the National Fire Protection Association's (NFPA) "Flammable and Combustible Liquids Code," (1977 or 1981), (incorporated by reference, see § 260.11). The owner or operator must obtain and keep on file at the facility a written certification by the local Fire Marshal that the installation meets the subject NFPA codes; and
- (3) The closure requirements of § 264.178 of this chapter.

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(b) Boiler load shall not be less than 40 percent. Boiler load is the ratio at any time of the total heat input to the maximum design heat input;

(c) Primary fuels and hazardous waste fuels shall have a minimum as-fired heating value of 8,000 Btu/lb, and each material fired in a burner where hazardous waste is fired must have a heating value of at least 8,000 Btu/lb, as-fired;

(d) The device shall operate in conformance with the carbon monoxide standard provided by § 266.104(b)(1). Boilers subject to the waiver of the DRE trial burn provided by this section are not eligible for the alternative carbon monoxide standard provided by § 266.104(c);

(e) The boiler must be a watertube type boiler that does not feed fuel using a stoker or stoker type mechanism; and

(f) The hazardous waste shall be fired directly into the primary fuel flame zone of the combustion chamber with an air or steam atomization firing system, mechanical atomization system, or a rotary cup atomization system under the following conditions:

- (1) *Viscosity.* The viscosity of the hazardous waste fuel as-fired shall not exceed 300 SSU;
- (2) *Particle size.* When a high pressure air or steam atomizer, low pressure atomizer, or mechanical atomizer is used, 70% of the hazardous waste fuel must pass through a 200 mesh (74 micron) screen, and when a rotary cup atomizer is used, 70% of the hazardous waste must pass through a 100 mesh (150 micron) screen;
- (3) *Mechanical atomization systems.* Fuel pressure within a mechanical atomization system and fuel flow rate shall be maintained within the design range taking into account the viscosity and volatility of the fuel;
- (4) *Rotary cup atomization systems.* Fuel flow rate through a rotary cup atomization system must be maintained within the design range taking into account the viscosity and volatility of the fuel.

(56 FR 7208, Feb. 21, 1991; 56 FR 32680, July 17, 1991, as amended at 56 FR 42515, Aug. 27, 1991)

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tion to predict ambient levels prescribed by this paragraph.

(iv) Ground level concentrations of constituents predicted under paragraph (a)(2)(iii) of this section must not exceed the following levels:

(A) For the noncarcinogenic compounds listed in appendix IV of this part, the levels established in appendix IV;

(B) For the carcinogenic compounds listed in appendix V of this part, the sum for all constituents of the ratios of the actual ground level concentration to the level established in appendix V cannot exceed 1.0; and

(C) For constituents not listed in appendix IV or V, 0.1 micrograms per cubic meter.

(b) *Waiver of particular matter standard.* The particulate matter standard of § 266.105 does not apply if:

- (1) The DRE standard is waived under paragraph (a) of this section; and
- (2) The owner or operator complies with the Tier I or adjusted Tier I metals feed rate screening limits provided by § 266.106 (b) or (e).

(56 FR 7208, Feb. 21, 1991; 56 FR 32680, July 17, 1991, as amended at 56 FR 42515, Aug. 27, 1991)

§ 266.110 Waiver of DRE trial burn for boilers.

Boilers that operate under the special requirements of this section, and that do not burn hazardous waste containing (or derived from) EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, or F027, are considered to be in conformance with the DRE standard of § 266.104(a), and a trial burn to demonstrate DRE is waived. When burning hazardous waste:

- (a) A minimum of 50 percent of fuel fired to the device shall be fossil fuel, fuels derived from fossil fuel, tail oil, or, if approved by the Director on a case-by-case basis, other nonhazardous fuel with combustion characteristics comparable to fossil fuel. Such fuels are termed "primary fuel" for purposes of this section. (Tail oil is a fuel derived from vegetable and rosin fatty acids.) The 50 percent primary fuel firing rate shall be determined on a total heat or mass input basis, whichever results in the greater mass feed rate of primary fuel fired;

(e) *Direct transfer equipment.* Direct transfer equipment must meet the following requirements:

(1) *Secondary containment.* Owners and operators shall comply with the secondary containment requirements of § 265.193 of this chapter, except for paragraphs 265.193 (a), (d), (e), and (f) as follows:

(i) For all new direct transfer equipment, prior to their being put into service; and

(ii) For existing direct transfer equipment within 2 years after August 21, 1991.

(2) *Requirements prior to meeting secondary containment requirements.* (i) For existing direct transfer equipment that does not have secondary containment, the owner or operator shall determine whether the equipment is leaking or is unfit for use. The owner or operator shall obtain and keep on file at the facility a written assessment reviewed and certified by a qualified, registered professional engineer in accordance with § 270.11(d) of this chapter that attests to the equipment's integrity by August 21, 1992.

(ii) This assessment shall determine whether the direct transfer equipment is adequately designed and has sufficient structural strength and compatibility with the waste(s) to be transferred to ensure that it will not collapse, rupture, or fail. At a minimum, this assessment shall consider the following:

(A) Design standard(s), if available, according to which the direct transfer equipment was constructed;

(B) Hazardous characteristics of the waste(s) that have been or will be handled;

(C) Existing corrosion protection measures;

(D) Documented age of the equipment, if available, (otherwise, an estimate of the age); and

(E) Results of a leak test or other integrity examination such that the effects of temperature variations, vapor pockets, cracks, leaks, corrosion, and erosion are accounted for.

(iii) If, as a result of the assessment specified above, the direct transfer equipment is found to be leaking or unfit for use, the owner or operator

shall comply with the requirements of §§ 265.196 (a) and (b) of this chapter.

(3) *Inspections and recordkeeping.* (i) The owner or operator must inspect at least once each operating hour when hazardous waste is being transferred from the transport vehicle (container) to the boiler or industrial furnace:

(A) Overfill/spill control equipment (e.g., waste-feed cutoff systems, bypass systems, and drainage systems) to ensure that it is in good working order;

(B) The above ground portions of the direct transfer equipment to detect corrosion, erosion, or releases of waste (e.g., wet spots, dead vegetation); and

(C) Data gathered from monitoring equipment and leak-detection equipment, (e.g., pressure and temperature gauges) to ensure that the direct transfer equipment is being operated according to its design.

(ii) The owner or operator must inspect cathodic protection systems, if used, to ensure that they are functioning properly according to the schedule provided by § 265.195(b) of this chapter: (i) Records of inspections made under this paragraph shall be maintained in the operating record at the facility, and available for inspection for at least 3 years from the date of the inspection.

(4) *Design and installation of new ancillary equipment.* Owners and operators must comply with the requirements of § 265.192 of this chapter.

(5) *Response to leaks or spills.* Owners and operators must comply with the requirements of § 265.196 of this chapter.

(6) *Closure.* Owners and operators must comply with the requirements of § 265.197 of this chapter, except for § 265.197 (c)(2) through (c)(4).

[50 FR 666, Jan. 4, 1985, as amended at 56 FR 42515, Aug. 27, 1991]

§ 266.112 Regulation of residues.

A residue derived from the burning or processing of hazardous waste in a boiler or industrial furnace is not excluded from the definition of a hazardous waste under § 261.4(b) (4), (7), or (8) unless the device and the owner or operator meet the following requirements:

(a) The device meets the following criteria:

(1) *Boilers.* Boilers must burn at least 50% coal on a total heat input or mass input basis, whichever results in the greater mass feed rate of coal;

(2) *Ore or mineral furnaces.* Industrial furnaces subject to § 261.4(b)(7) must process at least 50% by weight normal, nonhazardous raw materials;

(3) *Cement kilns.* Cement kilns must process at least 50% by weight normal cement-production raw materials;

(b) The owner or operator demonstrates that the hazardous waste does not significantly affect the residue by demonstrating conformance with either of the following criteria:

(1) *Comparison of waste-derived residue with normal residue.* The waste-derived residue must not contain appendix VIII, part 261 constituents (toxic constituents) that could reasonably be attributable to the hazardous waste at concentrations significantly higher than in residue generated without burning or processing of hazardous waste, using the following procedure. Toxic compounds that could reasonably be attributable to burning or processing the hazardous waste (constituents of concern) include toxic constituents in the hazardous waste, and the organic compounds listed in appendix VIII of this part that may be generated as products of incomplete combustion. Sampling and analyses shall be in conformance with procedures prescribed in *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*, incorporated by reference in § 260.11(a) of this chapter.

(i) *Normal residue.* Concentrations of toxic constituents of concern in normal residue shall be determined based on analyses of a minimum of 10 samples representing a minimum of 10 days of operation. Composite samples may be used to develop a sample for analysis provided that the compositing period does not exceed 24 hours. The upper tolerance limit (at 95% confidence with a 95% proportion of the sample distribution) of the concentration in the normal residue shall be considered the statistically-derived concentration in the normal residue. If changes in raw materials or fuels reduce the statistically-derived concentrations of the toxic constituents of concern in the normal residue, the statistically-de-

rived concentrations must be revised or statistically-derived concentrations of toxic constituents in normal residue must be established for a new mode of operation with the new raw material or fuel. To determine the upper tolerance limit in the normal residue, the owner or operator shall use statistical procedures prescribed in "Statistical Methodology for Bevill Residue Determinations" in appendix IX of this part.

(ii) *Waste-derived residue.* Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has concentrations of toxic constituents that are higher than the concentrations established for the normal residue under paragraph (b)(1)(i) of this section. If so, hazardous waste burning has significantly affected the residue and the residue shall not be excluded from the definition of a hazardous waste. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed 24 hours. If more than one sample is analyzed to characterize waste-derived residues generated over a 24-hour period, the concentration of each toxic constituent shall be the arithmetic mean of the concentrations in the samples. No results may be disregarded; or

(2) *Comparison of waste-derived residue concentrations with health-based limits—*

(i) *Nonmetal constituents.* The concentration of each nonmetal toxic constituent of concern (specified in paragraph (b)(1) of this section) in the waste-derived residue must not exceed the health-based level specified in appendix VII of this part, or the level of detection (using analytical procedures prescribed in SW-846), whichever is higher. If a health-based limit for a constituent of concern is not listed in appendix VII of this part, then a limit of 0.002 micrograms per kilogram or the level of detection (using analytical procedures prescribed in SW-846), whichever is higher, shall be used. The levels specified in appendix VII of this

part (and the default level of 0.002 micrograms per kilogram or the level of detection for constituents as identified in Note 1 of appendix VII of this chapter) are administratively stayed under the condition, for those constituents specified in paragraph (b)(1) of this section, that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in § 268.43 of this chapter for F039 nonwastewaters. In complying with those alternative levels, if an owner or operator is unable to detect a constituent despite documenting use of best good-faith efforts as defined by applicable Agency guidance or standards, the owner or operator is deemed to be in compliance for that constituent. Until new guidance or standards are developed, the owner or operator may demonstrate such good-faith efforts by achieving a detection limit for the constituent that does not exceed an order of magnitude above the level provided by § 268.43 for F039 nonwastewaters. The stay will remain in effect until further administrative action is taken and notice is published in the FEDERAL REGISTER and the Code of Federal Regulations; and

(ii) *Metal constituents.* The concentration of metals in an extract obtained using the Toxicity Characteristic Leaching Procedure of § 261.24 of this chapter must not exceed the levels specified in appendix VII of this part; and

(iii) *Sampling and analysis.* Waste-derived residue shall be sampled and analyzed as often as necessary to determine whether the residue generated during each 24-hour period has con-

centrations of toxic constituents that are higher than the health-based levels. Concentrations of toxic constituents of concern in the waste-derived residue shall be determined based on analysis of one or more samples obtained over a 24-hour period. Multiple samples may be analyzed, and multiple samples may be taken to form a composite sample for analysis provided that the sampling period does not exceed 24 hours. If more than one sample is analyzed to characterize waste-derived residues generated over a 24-hour period, the concentration of each toxic constituent shall be the arithmetic mean of the concentrations in the samples. No results may be disregarded; and

(c) Records sufficient to document compliance with the provisions of this section shall be retained until closure of the boiler or industrial furnace unit. At a minimum, the following shall be recorded:

- (1) Levels of constituents in appendix VIII, part 261, that are present in waste-derived residues;
- (2) If the waste-derived residue is compared with normal residue under paragraph (b)(1) of this section:

- (i) The levels of constituents in appendix VIII, part 261, that are present in normal residues; and
- (ii) Data and information, including analyses of samples as necessary, obtained to determine if changes in raw materials or fuels would reduce the concentration of toxic constituents of concern in the normal residue.

(50 FR 666, Jan. 4, 1985, as amended at 56 FR 42516, Aug. 27, 1991; 57 FR 38566, Aug. 25, 1992; 58 FR 55602, Nov. 9, 1993)

APPENDIX I TO PART 266—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR METALS

TABLE I—A—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR NONCARCINOGENIC METALS FOR FACILITIES IN NONCOMPLEX TERRAIN

(Values for rural areas)

Thallium (g/hr)	Silver (g/hr)	Mercury (g/hr)	Lead (g/hr)	Barium (g/hr)	Antimony (g/hr)	Terrain adjusted eff. stack ht. (m)
6.0E+01	6.0E+02	6.0E+01	1.8E+01	1.0E+04	6.0E+01	4
6.8E+01	6.8E+02	6.8E+01	2.0E+01	1.1E+04	6.8E+01	6
7.6E+01	7.6E+02	7.6E+01	2.3E+01	1.2E+04	7.6E+01	8
8.5E+01	8.5E+02	8.5E+01	3.0E+01	1.4E+04	8.5E+01	10
9.6E+01	9.6E+02	9.6E+01	3.4E+01	1.6E+04	9.6E+01	12
1.1E+02	1.1E+03	1.1E+02	3.8E+01	1.7E+04	1.1E+02	14
1.3E+02	1.3E+03	1.3E+02	4.3E+01	2.0E+04	1.3E+02	16
1.4E+02	1.4E+03	1.4E+02	4.8E+01	2.2E+04	1.4E+02	18
1.6E+02	1.6E+03	1.6E+02	5.4E+01	2.7E+04	1.6E+02	20
2.0E+02	2.0E+03	2.0E+02	6.8E+01	3.0E+04	2.0E+02	22
2.3E+02	2.3E+03	2.3E+02	7.8E+01	3.3E+04	2.3E+02	24
2.6E+02	2.6E+03	2.6E+02	8.8E+01	3.9E+04	2.6E+02	26
3.0E+02	3.0E+03	3.0E+02	9.0E+01	4.5E+04	3.0E+02	28
4.0E+02	4.0E+03	4.0E+02	1.1E+02	5.0E+04	4.0E+02	30
4.6E+02	4.6E+03	4.6E+02	1.3E+02	5.8E+04	4.6E+02	32
6.0E+02	6.0E+03	6.0E+02	1.8E+02	7.8E+04	6.0E+02	34
7.8E+02	7.8E+03	7.8E+02	2.3E+02	1.0E+05	7.8E+02	36
9.6E+02	9.6E+03	9.6E+02	2.9E+02	1.3E+05	9.6E+02	38
1.1E+03	1.1E+04	1.1E+03	3.5E+02	1.7E+05	1.1E+03	40
1.3E+03	1.3E+04	1.3E+03	4.3E+02	2.0E+05	1.3E+03	42
1.5E+03	1.5E+04	1.5E+03	5.0E+02	2.5E+05	1.5E+03	44
1.7E+03	1.7E+04	1.7E+03	5.8E+02	3.2E+05	1.7E+03	46
1.9E+03	1.9E+04	1.9E+03	6.4E+02	3.8E+05	1.9E+03	48
2.2E+03	2.2E+04	2.2E+03	7.6E+02	4.0E+05	2.2E+03	50
2.5E+03	2.5E+04	2.5E+03	8.2E+02	4.6E+05	2.5E+03	52
3.2E+03	3.2E+04	3.2E+03	9.6E+02	5.4E+05	3.2E+03	54
3.6E+03	3.6E+04	3.6E+03	1.1E+03	6.0E+05	3.6E+03	56
4.0E+03	4.0E+04	4.0E+03	1.2E+03	6.8E+05	4.0E+03	58
4.6E+03	4.6E+04	4.6E+03	1.4E+03	7.8E+05	4.6E+03	60
5.4E+03	5.4E+04	5.4E+03	1.6E+03	8.2E+05	5.4E+03	62
6.0E+03	6.0E+04	6.0E+03	1.8E+03	1.0E+06	6.0E+03	64
6.8E+03	6.8E+04	6.8E+03	2.0E+03	1.1E+06	6.8E+03	66
7.6E+03	7.6E+04	7.6E+03	2.3E+03	1.3E+06	7.6E+03	68
8.5E+03	8.5E+04	8.5E+03	2.9E+03	1.7E+06	8.5E+03	70
9.6E+03	9.6E+04	9.6E+03	3.5E+03	2.0E+06	9.6E+03	72
1.1E+04	1.1E+05	1.1E+04	4.3E+03	2.5E+06	1.1E+04	74
1.3E+04	1.3E+05	1.3E+04	5.0E+03	3.2E+06	1.3E+04	76
1.5E+04	1.5E+05	1.5E+04	5.8E+03	3.8E+06	1.5E+04	78
1.7E+04	1.7E+05	1.7E+04	6.4E+03	4.0E+06	1.7E+04	80
1.9E+04	1.9E+05	1.9E+04	7.6E+03	4.6E+06	1.9E+04	82
2.2E+04	2.2E+05	2.2E+04	8.2E+03	5.4E+06	2.2E+04	84
2.5E+04	2.5E+05	2.5E+04	9.6E+03	6.0E+06	2.5E+04	86
3.2E+04	3.2E+05	3.2E+04	1.1E+04	6.8E+06	3.2E+04	88
3.6E+04	3.6E+05	3.6E+04	1.2E+04	7.8E+06	3.6E+04	90
4.0E+04	4.0E+05	4.0E+04	1.4E+04	8.2E+06	4.0E+04	92
4.6E+04	4.6E+05	4.6E+04	1.6E+04	1.0E+07	4.6E+04	94
5.4E+04	5.4E+05	5.4E+04	1.8E+04	1.1E+07	5.4E+04	96
6.0E+04	6.0E+05	6.0E+04	2.0E+04	1.3E+07	6.0E+04	98
6.8E+04	6.8E+05	6.8E+04	2.3E+04	1.7E+07	6.8E+04	100
7.6E+04	7.6E+05	7.6E+04	2.9E+04	2.0E+07	7.6E+04	102
8.5E+04	8.5E+05	8.5E+04	3.5E+04	2.5E+07	8.5E+04	104
9.6E+04	9.6E+05	9.6E+04	4.3E+04	3.2E+07	9.6E+04	106
1.1E+05	1.1E+06	1.1E+05	5.0E+04	3.8E+07	1.1E+05	108
1.3E+05	1.3E+06	1.3E+05	5.8E+04	4.0E+07	1.3E+05	110
1.5E+05	1.5E+06	1.5E+05	6.4E+04	4.6E+07	1.5E+05	112
1.7E+05	1.7E+06	1.7E+05	7.6E+04	5.4E+07	1.7E+05	114
1.9E+05	1.9E+06	1.9E+05	8.2E+04	6.0E+07	1.9E+05	116
2.2E+05	2.2E+06	2.2E+05	9.6E+04	6.8E+07	2.2E+05	118
2.5E+05	2.5E+06	2.5E+05	1.1E+05	7.8E+07	2.5E+05	120

TABLE I—B—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR NONCARCINOGENIC METALS FOR FACILITIES IN NONCOMPLEX TERRAIN

(Values for rural areas)

Thallium (g/hr)	Silver (g/hr)	Mercury (g/hr)	Lead (g/hr)	Barium (g/hr)	Antimony (g/hr)	Terrain adjusted eff. stack ht. (m)
3.1E+01	3.1E+02	3.1E+01	9.4E+00	5.2E+03	3.1E+01	4

TABLE I-B—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR FACILITIES IN NONCOMPLEX TERRAIN—Continued

Values for rural areas					
Thallium (g/hr)	Silver (g/hr)	Mercury (g/hr)	Lead (g/hr)	Barium (g/hr)	Antimony (g/hr)
3.6E+01	3.6E+02	3.6E+01	1.1E+01	6.0E+03	3.6E+01
4.0E+01	4.0E+02	4.0E+01	1.2E+01	6.8E+03	4.0E+01
4.5E+01	4.5E+02	4.5E+01	1.4E+01	7.8E+03	4.5E+01
5.8E+01	5.8E+02	5.8E+01	1.7E+01	9.8E+03	5.8E+01
6.8E+01	6.8E+02	6.8E+01	2.1E+01	1.1E+04	6.8E+01
8.6E+01	8.6E+02	8.6E+01	2.6E+01	1.4E+04	8.6E+01
1.1E+02	1.1E+03	1.1E+02	3.2E+01	1.8E+04	1.1E+02
1.3E+02	1.3E+03	1.3E+02	4.0E+01	2.2E+04	1.3E+02
1.7E+02	1.7E+03	1.7E+02	5.0E+01	2.8E+04	1.7E+02
2.2E+02	2.2E+03	2.2E+02	6.4E+01	3.6E+04	2.2E+02
2.8E+02	2.8E+03	2.8E+02	8.2E+01	4.6E+04	2.8E+02
3.5E+02	3.5E+03	3.5E+02	1.0E+02	5.8E+04	3.5E+02
4.3E+02	4.3E+03	4.3E+02	1.3E+02	7.6E+04	4.3E+02
7.2E+02	7.2E+03	7.2E+02	2.1E+02	1.2E+05	7.2E+02
1.1E+03	1.1E+04	1.1E+03	3.2E+02	1.8E+05	1.1E+03
1.5E+03	1.5E+04	1.5E+03	4.5E+02	2.5E+05	1.5E+03
2.0E+03	2.0E+04	2.0E+03	6.0E+02	3.0E+05	2.0E+03
2.8E+03	2.8E+04	2.8E+03	8.0E+02	4.0E+05	2.8E+03
3.6E+03	3.6E+04	3.6E+03	1.0E+03	5.0E+05	3.6E+03
4.4E+03	4.4E+04	4.4E+03	1.2E+03	6.0E+05	4.4E+03
5.2E+03	5.2E+04	5.2E+03	1.4E+03	7.0E+05	5.2E+03
6.0E+03	6.0E+04	6.0E+03	1.6E+03	8.0E+05	6.0E+03
6.8E+03	6.8E+04	6.8E+03	1.8E+03	9.0E+05	6.8E+03
7.6E+03	7.6E+04	7.6E+03	2.0E+03	1.0E+06	7.6E+03
8.4E+03	8.4E+04	8.4E+03	2.2E+03	1.1E+06	8.4E+03
9.2E+03	9.2E+04	9.2E+03	2.4E+03	1.2E+06	9.2E+03
1.0E+04	1.0E+05	1.0E+04	2.6E+03	1.3E+06	1.0E+04
1.1E+04	1.1E+05	1.1E+04	2.8E+03	1.4E+06	1.1E+04
1.2E+04	1.2E+05	1.2E+04	3.0E+03	1.5E+06	1.2E+04
1.3E+04	1.3E+05	1.3E+04	3.2E+03	1.6E+06	1.3E+04
1.4E+04	1.4E+05	1.4E+04	3.4E+03	1.7E+06	1.4E+04
1.5E+04	1.5E+05	1.5E+04	3.6E+03	1.8E+06	1.5E+04
1.6E+04	1.6E+05	1.6E+04	3.8E+03	1.9E+06	1.6E+04
1.7E+04	1.7E+05	1.7E+04	4.0E+03	2.0E+06	1.7E+04
1.8E+04	1.8E+05	1.8E+04	4.2E+03	2.1E+06	1.8E+04
1.9E+04	1.9E+05	1.9E+04	4.4E+03	2.2E+06	1.9E+04
2.0E+04	2.0E+05	2.0E+04	4.6E+03	2.3E+06	2.0E+04
2.1E+04	2.1E+05	2.1E+04	4.8E+03	2.4E+06	2.1E+04
2.2E+04	2.2E+05	2.2E+04	5.0E+03	2.5E+06	2.2E+04
2.3E+04	2.3E+05	2.3E+04	5.2E+03	2.6E+06	2.3E+04
2.4E+04	2.4E+05	2.4E+04	5.4E+03	2.7E+06	2.4E+04
2.5E+04	2.5E+05	2.5E+04	5.6E+03	2.8E+06	2.5E+04
2.6E+04	2.6E+05	2.6E+04	5.8E+03	2.9E+06	2.6E+04
2.7E+04	2.7E+05	2.7E+04	6.0E+03	3.0E+06	2.7E+04
2.8E+04	2.8E+05	2.8E+04	6.2E+03	3.1E+06	2.8E+04
2.9E+04	2.9E+05	2.9E+04	6.4E+03	3.2E+06	2.9E+04
3.0E+04	3.0E+05	3.0E+04	6.6E+03	3.3E+06	3.0E+04
3.1E+04	3.1E+05	3.1E+04	6.8E+03	3.4E+06	3.1E+04
3.2E+04	3.2E+05	3.2E+04	7.0E+03	3.5E+06	3.2E+04
3.3E+04	3.3E+05	3.3E+04	7.2E+03	3.6E+06	3.3E+04
3.4E+04	3.4E+05	3.4E+04	7.4E+03	3.7E+06	3.4E+04
3.5E+04	3.5E+05	3.5E+04	7.6E+03	3.8E+06	3.5E+04
3.6E+04	3.6E+05	3.6E+04	7.8E+03	3.9E+06	3.6E+04
3.7E+04	3.7E+05	3.7E+04	8.0E+03	4.0E+06	3.7E+04
3.8E+04	3.8E+05	3.8E+04	8.2E+03	4.1E+06	3.8E+04
3.9E+04	3.9E+05	3.9E+04	8.4E+03	4.2E+06	3.9E+04
4.0E+04	4.0E+05	4.0E+04	8.6E+03	4.3E+06	4.0E+04
4.1E+04	4.1E+05	4.1E+04	8.8E+03	4.4E+06	4.1E+04
4.2E+04	4.2E+05	4.2E+04	9.0E+03	4.5E+06	4.2E+04
4.3E+04	4.3E+05	4.3E+04	9.2E+03	4.6E+06	4.3E+04
4.4E+04	4.4E+05	4.4E+04	9.4E+03	4.7E+06	4.4E+04
4.5E+04	4.5E+05	4.5E+04	9.6E+03	4.8E+06	4.5E+04
4.6E+04	4.6E+05	4.6E+04	9.8E+03	4.9E+06	4.6E+04
4.7E+04	4.7E+05	4.7E+04	1.0E+04	5.0E+06	4.7E+04
4.8E+04	4.8E+05	4.8E+04	1.0E+04	5.1E+06	4.8E+04
4.9E+04	4.9E+05	4.9E+04	1.0E+04	5.2E+06	4.9E+04
5.0E+04	5.0E+05	5.0E+04	1.0E+04	5.3E+06	5.0E+04
5.1E+04	5.1E+05	5.1E+04	1.0E+04	5.4E+06	5.1E+04
5.2E+04	5.2E+05	5.2E+04	1.0E+04	5.5E+06	5.2E+04
5.3E+04	5.3E+05	5.3E+04	1.0E+04	5.6E+06	5.3E+04
5.4E+04	5.4E+05	5.4E+04	1.0E+04	5.7E+06	5.4E+04
5.5E+04	5.5E+05	5.5E+04	1.0E+04	5.8E+06	5.5E+04
5.6E+04	5.6E+05	5.6E+04	1.0E+04	5.9E+06	5.6E+04
5.7E+04	5.7E+05	5.7E+04	1.0E+04	6.0E+06	5.7E+04
5.8E+04	5.8E+05	5.8E+04	1.0E+04	6.1E+06	5.8E+04
5.9E+04	5.9E+05	5.9E+04	1.0E+04	6.2E+06	5.9E+04
6.0E+04	6.0E+05	6.0E+04	1.0E+04	6.3E+06	6.0E+04
6.1E+04	6.1E+05	6.1E+04	1.0E+04	6.4E+06	6.1E+04
6.2E+04	6.2E+05	6.2E+04	1.0E+04	6.5E+06	6.2E+04
6.3E+04	6.3E+05	6.3E+04	1.0E+04	6.6E+06	6.3E+04
6.4E+04	6.4E+05	6.4E+04	1.0E+04	6.7E+06	6.4E+04
6.5E+04	6.5E+05	6.5E+04	1.0E+04	6.8E+06	6.5E+04
6.6E+04	6.6E+05	6.6E+04	1.0E+04	6.9E+06	6.6E+04
6.7E+04	6.7E+05	6.7E+04	1.0E+04	7.0E+06	6.7E+04
6.8E+04	6.8E+05	6.8E+04	1.0E+04	7.1E+06	6.8E+04
6.9E+04	6.9E+05	6.9E+04	1.0E+04	7.2E+06	6.9E+04
7.0E+04	7.0E+05	7.0E+04	1.0E+04	7.3E+06	7.0E+04
7.1E+04	7.1E+05	7.1E+04	1.0E+04	7.4E+06	7.1E+04
7.2E+04	7.2E+05	7.2E+04	1.0E+04	7.5E+06	7.2E+04
7.3E+04	7.3E+05	7.3E+04	1.0E+04	7.6E+06	7.3E+04
7.4E+04	7.4E+05	7.4E+04	1.0E+04	7.7E+06	7.4E+04
7.5E+04	7.5E+05	7.5E+04	1.0E+04	7.8E+06	7.5E+04
7.6E+04	7.6E+05	7.6E+04	1.0E+04	7.9E+06	7.6E+04
7.7E+04	7.7E+05	7.7E+04	1.0E+04	8.0E+06	7.7E+04
7.8E+04	7.8E+05	7.8E+04	1.0E+04	8.1E+06	7.8E+04
7.9E+04	7.9E+05	7.9E+04	1.0E+04	8.2E+06	7.9E+04
8.0E+04	8.0E+05	8.0E+04	1.0E+04	8.3E+06	8.0E+04
8.1E+04	8.1E+05	8.1E+04	1.0E+04	8.4E+06	8.1E+04
8.2E+04	8.2E+05	8.2E+04	1.0E+04	8.5E+06	8.2E+04
8.3E+04	8.3E+05	8.3E+04	1.0E+04	8.6E+06	8.3E+04
8.4E+04	8.4E+05	8.4E+04	1.0E+04	8.7E+06	8.4E+04
8.5E+04	8.5E+05	8.5E+04	1.0E+04	8.8E+06	8.5E+04
8.6E+04	8.6E+05	8.6E+04	1.0E+04	8.9E+06	8.6E+04
8.7E+04	8.7E+05	8.7E+04	1.0E+04	9.0E+06	8.7E+04
8.8E+04	8.8E+05	8.8E+04	1.0E+04	9.1E+06	8.8E+04
8.9E+04	8.9E+05	8.9E+04	1.0E+04	9.2E+06	8.9E+04
9.0E+04	9.0E+05	9.0E+04	1.0E+04	9.3E+06	9.0E+04
9.1E+04	9.1E+05	9.1E+04	1.0E+04	9.4E+06	9.1E+04
9.2E+04	9.2E+05	9.2E+04	1.0E+04	9.5E+06	9.2E+04
9.3E+04	9.3E+05	9.3E+04	1.0E+04	9.6E+06	9.3E+04
9.4E+04	9.4E+05	9.4E+04	1.0E+04	9.7E+06	9.4E+04
9.5E+04	9.5E+05	9.5E+04	1.0E+04	9.8E+06	9.5E+04
9.6E+04	9.6E+05	9.6E+04	1.0E+04	9.9E+06	9.6E+04
9.7E+04	9.7E+05	9.7E+04	1.0E+04	1.0E+07	9.7E+04
9.8E+04	9.8E+05	9.8E+04	1.0E+04	1.0E+07	9.8E+04
9.9E+04	9.9E+05	9.9E+04	1.0E+04	1.0E+07	9.9E+04
1.0E+05	1.0E+06	1.0E+05	1.0E+04	1.0E+07	1.0E+05

TABLE I-D—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR CARCINOGENIC METALS FOR FACILITIES IN NONCOMPLEX TERRAIN

12	5.4E+01	9.0E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	1.7E+01	5.4E+01	2.4E+03	
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TABLE I-E—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR CARCINOGENIC METALS FOR FACILITIES IN COMPLEX TERRAIN

Values for use in urban areas

Terrain adjusted eff. stack ht. (m)	Arsenic (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	1.1E-01	2.8E-01	4.0E-02
6	2.4E-01	8.8E-01	5.8E-02
8	3.5E-01	1.0E-01	6.8E-01
10	4.3E-01	1.0E-01	7.6E-01
12	5.0E-01	1.0E-01	9.4E-01
14	6.0E-01	1.4E-01	1.1E+00
16	6.8E-01	1.6E-01	1.2E+01
18	7.6E-01	1.8E-01	1.3E+00
20	8.2E-01	1.9E-01	1.3E+00
22	9.0E-01	2.1E+00	1.5E+00
24	1.0E+00	2.4E+00	1.6E+00
26	1.1E+00	2.7E+00	1.8E+00
28	1.2E+00	3.0E+00	2.0E+00
30	1.3E+00	3.2E+00	2.2E+00
35	1.5E+00	4.0E+00	2.7E+00
40	1.9E+00	4.5E+00	3.4E+00

Values for use in rural areas

Terrain adjusted eff. stack ht. (m)	Arsenic (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	1.1E-01	2.8E-01	4.0E-02
6	2.4E-01	8.8E-01	5.8E-02
8	3.5E-01	1.0E-01	6.8E-01
10	4.3E-01	1.0E-01	7.6E-01
12	5.0E-01	1.0E-01	9.4E-01
14	6.0E-01	1.4E-01	1.1E+00
16	6.8E-01	1.6E-01	1.2E+01
18	7.6E-01	1.8E-01	1.3E+00
20	8.2E-01	1.9E-01	1.3E+00
22	9.0E-01	2.1E+00	1.5E+00
24	1.0E+00	2.4E+00	1.6E+00
26	1.1E+00	2.7E+00	1.8E+00
28	1.2E+00	3.0E+00	2.0E+00
30	1.3E+00	3.2E+00	2.2E+00
35	1.5E+00	4.0E+00	2.7E+00
40	1.9E+00	4.5E+00	3.4E+00

TABLE I-D—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR CARCINOGENIC METALS FOR FACILITIES IN NONCOMPLEX TERRAIN—Continued

Values for use in urban areas

Terrain adjusted eff. stack ht. (m)	Arsenic (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	1.1E-01	2.8E-01	4.0E-02
6	2.4E-01	8.8E-01	5.8E-02
8	3.5E-01	1.0E-01	6.8E-01
10	4.3E-01	1.0E-01	7.6E-01
12	5.0E-01	1.0E-01	9.4E-01
14	6.0E-01	1.4E-01	1.1E+00
16	6.8E-01	1.6E-01	1.2E+01
18	7.6E-01	1.8E-01	1.3E+00
20	8.2E-01	1.9E-01	1.3E+00
22	9.0E-01	2.1E+00	1.5E+00
24	1.0E+00	2.4E+00	1.6E+00
26	1.1E+00	2.7E+00	1.8E+00
28	1.2E+00	3.0E+00	2.0E+00
30	1.3E+00	3.2E+00	2.2E+00
35	1.5E+00	4.0E+00	2.7E+00
40	1.9E+00	4.5E+00	3.4E+00

Values for use in rural areas

Terrain adjusted eff. stack ht. (m)	Arsenic (g/hr)	Chromium (g/hr)	Beryllium (g/hr)
4	1.1E-01	2.8E-01	4.0E-02
6	2.4E-01	8.8E-01	5.8E-02
8	3.5E-01	1.0E-01	6.8E-01
10	4.3E-01	1.0E-01	7.6E-01
12	5.0E-01	1.0E-01	9.4E-01
14	6.0E-01	1.4E-01	1.1E+00
16	6.8E-01	1.6E-01	1.2E+01
18	7.6E-01	1.8E-01	1.3E+00
20	8.2E-01	1.9E-01	1.3E+00
22	9.0E-01	2.1E+00	1.5E+00
24	1.0E+00	2.4E+00	1.6E+00
26	1.1E+00	2.7E+00	1.8E+00
28	1.2E+00	3.0E+00	2.0E+00
30	1.3E+00	3.2E+00	2.2E+00
35	1.5E+00	4.0E+00	2.7E+00
40	1.9E+00	4.5E+00	3.4E+00

TABLE I-D—TIER I AND TIER II FEED RATE AND EMISSIONS SCREENING LIMITS FOR CARCINOGENIC METALS FOR FACILITIES IN NONCOMPLEX TERRAIN—Continued

APPENDIX II TO PART 266—TIER I FEED RATE SCREENING LIMITS FOR TOTAL CHLORINE

Terrain-adjusted effective stack height (m)	Noncomplex terrain			Complex terrain
	Urban (g/hr)		Rural (g/hr)	
	C ₁ (g/hr)	C ₂ (g/hr)	C ₁ (g/hr)	
4	9.2E+01	4.2E+01	4.2E+01	1.8E+01
6	9.1E+01	4.8E+01	4.8E+01	2.0E+01
8	1.0E+02	5.3E+01	5.3E+01	4.1E+01
10	1.2E+02	6.2E+01	6.2E+01	5.8E+01
12	1.3E+02	7.7E+01	7.7E+01	7.2E+01
14	1.5E+02	9.1E+01	9.1E+01	9.1E+01
16	1.7E+02	1.2E+02	1.2E+02	1.1E+02
18	1.9E+02	1.4E+02	1.4E+02	1.2E+02
20	2.1E+02	1.6E+02	1.6E+02	1.3E+02
22	2.4E+02	2.3E+02	2.3E+02	1.4E+02
24	2.7E+02	2.9E+02	2.9E+02	1.6E+02
26	3.1E+02	3.7E+02	3.7E+02	1.7E+02
28	3.5E+02	4.7E+02	4.7E+02	1.9E+02
30	3.9E+02	5.8E+02	5.8E+02	2.1E+02
32	4.3E+02	6.9E+02	6.9E+02	2.6E+02
34	4.7E+02	8.0E+02	8.0E+02	3.3E+02
36	5.1E+02	9.1E+02	9.1E+02	4.0E+02
38	5.5E+02	1.0E+03	1.0E+03	4.8E+02
40	5.9E+02	1.1E+03	1.1E+03	5.6E+02
42	6.3E+02	1.2E+03	1.2E+03	6.2E+02
44	6.7E+02	1.3E+03	1.3E+03	6.7E+02
46	7.1E+02	1.4E+03	1.4E+03	7.2E+02
48	7.5E+02	1.5E+03	1.5E+03	7.7E+02
50	7.9E+02	1.6E+03	1.6E+03	8.2E+02
52	8.3E+02	1.7E+03	1.7E+03	8.7E+02
54	8.7E+02	1.8E+03	1.8E+03	9.1E+02
56	9.1E+02	1.9E+03	1.9E+03	9.6E+02
58	9.5E+02	2.0E+03	2.0E+03	1.0E+03
60	9.9E+02	2.1E+03	2.1E+03	1.1E+03
62	1.0E+03	2.2E+03	2.2E+03	1.2E+03
64	1.0E+03	2.3E+03	2.3E+03	1.3E+03
66	1.0E+03	2.4E+03	2.4E+03	1.4E+03
68	1.0E+03	2.5E+03	2.5E+03	1.5E+03
70	1.0E+03	2.6E+03	2.6E+03	1.6E+03
72	1.0E+03	2.7E+03	2.7E+03	1.7E+03
74	1.0E+03	2.8E+03	2.8E+03	1.8E+03
76	1.0E+03	2.9E+03	2.9E+03	1.9E+03
78	1.0E+03	3.0E+03	3.0E+03	2.0E+03
80	1.0E+03	3.1E+03	3.1E+03	2.1E+03
82	1.0E+03	3.2E+03	3.2E+03	2.2E+03
84	1.0E+03	3.3E+03	3.3E+03	2.3E+03
86	1.0E+03	3.4E+03	3.4E+03	2.4E+03
88	1.0E+03	3.5E+03	3.5E+03	2.5E+03
90	1.0E+03	3.6E+03	3.6E+03	2.6E+03
92	1.0E+03	3.7E+03	3.7E+03	2.7E+03
94	1.0E+03	3.8E+03	3.8E+03	2.8E+03
96	1.0E+03	3.9E+03	3.9E+03	2.9E+03
98	1.0E+03	4.0E+03	4.0E+03	3.0E+03
100	1.0E+03	4.1E+03	4.1E+03	3.1E+03
102	1.0E+03	4.2E+03	4.2E+03	3.2E+03
104	1.0E+03	4.3E+03	4.3E+03	3.3E+03
106	1.0E+03	4.4E+03	4.4E+03	3.4E+03
108	1.0E+03	4.5E+03	4.5E+03	3.5E+03
110	1.0E+03	4.6E+03	4.6E+03	3.6E+03
112	1.0E+03	4.7E+03	4.7E+03	3.7E+03
114	1.0E+03	4.8E+03	4.8E+03	3.8E+03
116	1.0E+03	4.9E+03	4.9E+03	3.9E+03
118	1.0E+03	5.0E+03	5.0E+03	4.0E+03
120	1.0E+03	5.1E+03	5.1E+03	4.1E+03

[56 FR 32680, July 17, 1991]

APPENDIX III TO PART 266—TIER II EMISSION RATE SCREENING LIMITS FOR FREE CHLORINE AND HYDROGEN CHLORIDE

Terrain-adjusted effective stack height (m)	Noncomplex terrain			Complex terrain		
	Urban (g/hr)		Rural (g/hr)	Urban (g/hr)		Rural (g/hr)
	C ₁ (g/hr)	C ₂ (g/hr)	C ₁ (g/hr)	C ₁ (g/hr)	C ₂ (g/hr)	C ₁ (g/hr)
4	9.2E+01	4.2E+01	4.2E+01	1.9E+01	7.3E+02	3.3E+02
6	9.1E+01	4.8E+01	4.8E+01	2.8E+01	8.3E+02	3.9E+02
8	1.0E+02	5.3E+01	5.3E+01	3.7E+01	9.2E+02	4.5E+02
10	1.2E+02	6.2E+01	6.2E+01	4.6E+01	1.0E+03	5.1E+02
12	1.3E+02	7.7E+01	7.7E+01	5.5E+01	1.1E+03	5.7E+02
14	1.5E+02	9.1E+01	9.1E+01	6.4E+01	1.2E+03	6.3E+02
16	1.7E+02	1.2E+02	1.2E+02	7.3E+01	1.3E+03	6.9E+02
18	1.9E+02	1.4E+02	1.4E+02	8.2E+01	1.4E+03	7.5E+02
20	2.1E+02	1.6E+02	1.6E+02	9.1E+01	1.5E+03	8.1E+02
22	2.4E+02	2.3E+02	2.3E+02	1.0E+02	1.6E+03	8.7E+02
24	2.7E+02	2.9E+02	2.9E+02	1.1E+02	1.7E+03	9.3E+02
26	3.1E+02	3.7E+02	3.7E+02	1.2E+02	1.8E+03	9.9E+02
28	3.5E+02	4.7E+02	4.7E+02	1.3E+02	1.9E+03	1.0E+03
30	3.9E+02	5.8E+02	5.8E+02	1.4E+02	2.0E+03	1.1E+03
32	4.3E+02	6.9E+02	6.9E+02	1.5E+02	2.1E+03	1.2E+03
34	4.7E+02	8.0E+02	8.0E+02	1.6E+02	2.2E+03	1.3E+03
36	5.1E+02	9.1E+02	9.1E+02	1.7E+02	2.3E+03	1.4E+03
38	5.5E+02	1.0E+03	1.0E+03	1.8E+02	2.4E+03	1.5E+03
40	5.9E+02	1.1E+03	1.1E+03	1.9E+02	2.5E+03	1.6E+03
42	6.3E+02	1.2E+03	1.2E+03	2.0E+02	2.6E+03	1.7E+03
44	6.7E+02	1.3E+03	1.3E+03	2.1E+02	2.7E+03	1.8E+03
46	7.1E+02	1.4E+03	1.4E+03	2.2E+02	2.8E+03	1.9E+03
48	7.5E+02	1.5E+03	1.5E+03	2.3E+02	2.9E+03	2.0E+03
50	7.9E+02	1.6E+03	1.6E+03	2.4E+02	3.0E+03	2.1E+03
52	8.3E+02	1.7E+03	1.7E+03	2.5E+02	3.1E+03	2.2E+03
54	8.7E+02	1.8E+03	1.8E+03	2.6E+02	3.2E+03	2.3E+03
56	9.1E+02	1.9E+03	1.9E+03	2.7E+02	3.3E+03	2.4E+03
58	9.5E+02	2.0E+03	2.0E+03	2.8E+02	3.4E+03	2.5E+03
60	9.9E+02	2.1E+03	2.1E+03	2.9E+02	3.5E+03	2.6E+03
62	1.0E+03	2.2E+03	2.2E+03	3.0E+02	3.6E+03	2.7E+03
64	1.0E+03	2.3E+03	2.3E+03	3.1E+02	3.7E+03	2.8E+03
66	1.0E+03	2.4E+03	2.4E+03	3.2E+02	3.8E+03	2.9E+03
68	1.0E+03	2.5E+03	2.5E+03	3.3E+02	3.9E+03	3.0E+03
70	1.0E+03	2.6E+03	2.6E+03	3.4E+02	4.0E+03	3.1E+03
72	1.0E+03	2.7E+03	2.7E+03	3.5E+02	4.1E+03	3.2E+03
74	1.0E+03	2.8E+03	2.8E+03	3.6E+02	4.2E+03	3.3E+03
76	1.0E+03	2.9E+03	2.9E+03	3.7E+02	4.3E+03	3.4E+03
78	1.0E+03	3.0E+03	3.0E+03	3.8E+02	4.4E+03	3.5E+03
80	1.0E+03	3.1E+03	3.1E+03	3.9E+02	4.5E+03	3.6E+03
82	1.0E+03	3.2E+03	3.2E+03	4.0E+02	4.6E+03	3.7E+03
84	1.0E+03	3.3E+03	3.3E+03	4.1E+02	4.7E+03	3.8E+03
86	1.0E+03	3.4E+03	3.4E+03	4.2E+02	4.8E+03	3.9E+03
88	1.0E+03	3.5E+03	3.5E+03	4.3E+02	4.9E+03	4.0E+03
90	1.0E+03	3.6E+03	3.6E+03	4.4E+02	5.0E+03	4.1E+03
92	1.0E+03	3.7E+03	3.7E+03	4.5E+02	5.1E+03	4.2E+03
94	1.0E+03	3.8E+03	3.8E+03	4.6E+02	5.2E+03	4.3E+03
96	1.0E+03	3.9E+03	3.9E+03	4.7E+02	5.3E+03	4.4E+03
98	1.0E+03	4.0E+03	4.0E+03	4.8E+02	5.4E+03	4.5E+03
100	1.0E+03	4.1E+03	4.1E+03	4.9E+02	5.5E+03	4.6E+03
102	1.0E+03	4.2E+03	4.2E+03	5.0E+02	5.6E+03	4.7E+03
104	1.0E+03	4.3E+03	4.3E+03	5.1E+02	5.7E+03	4.8E+03
106	1.0E+03	4.4E+03	4.4E+03	5.2E+02	5.8E+03	4.9E+03
108	1.0E+03	4.5E+03	4.5E+03	5.3E+02	5.9E+03	5.0E+03
110	1.0E+03	4.6E+03	4.6E+03	5.4E+02	6.0E+03	5.1E+03
112	1.0E+03	4.7E+03	4.7E+03	5.5E+02	6.1E+03	5.2E+03
114	1.0E+03	4.8E+03	4.8E+03	5.6E+02	6.2E+03	5.3E+03
116	1.0E+03	4.9E+03	4.9E+03	5.7E+02	6.3E+03	5.4E+03
118	1.0E+03	5.0E+03	5.0E+03	5.8E+02	6.4E+03	5.5E+03
120	1.0E+03	5.1E+03	5.1E+03	5.9E+02	6.5E+03	5.6E+03

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APPENDIX III TO PART 266—TIER II EMISSION RATE SCREENING LIMITS FOR FREE CHLORINE AND HYDROGEN CHLORIDE—Continued

Terrain-adjusted effective stack height (m)	Noncomplex terrain			Complex terrain
	Urban (g/hr)		Rural (g/hr)	
	C ₁ (g/hr)	C ₂ (g/hr)	C ₁ (g/hr)	
70	2.3E+03	3.9E+04	7.2E+03	1.1E+05
75	2.5E+03	4.5E+04	8.6E+03	1.2E+05
80	2.9E+03	5.0E+04	1.0E+04	1.3E+05
85	3.3E+03	5.8E+04	1.2E+04	1.4E+05
90	3.7E+03	6.6E+04	1.4E+04	1.5E+05
95	4.2E+03	7.4E+04	1.7E+04	1.6E+05
100	4.8E+03	8.4E+04	2.1E+04	1.8E+05
105	5.3E+03	9.2E+04	2.4E+04	2.0E+05
110	5.9E+03	1.0E+05	2.9E+04	2.2E+05
115	6.2E+03	1.1E+05	3.5E+04	2.5E+05
120	6.7E+03	1.2E+05	4.1E+04	2.8E+05

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APPENDIX IV TO PART 266—REFERENCE AIR CONCENTRATIONS*

Constituent	CAS No.	RAC (µg/m³)	Constituent	CAS No.	RAC (µg/m³)
Acetaldehyde	75-07-0	10	Lead	7439-92-1	0.09
Acetonitrile	75-05-8	10	Maleic Anhydride	108-31-6	100
Acetophenone	98-06-2	100	Mercury	7439-97-6	0.3
Acrolein	107-02-8	20	Methacrylonitrile	126-98-7	0.1
Aldicarb	116-06-3	1	Methoxychlor	1652-77-5	20
Aluminum Phosphide	20659-73-8	0.3	Methyl Chloroformate	72-43-6	50
Amyl Alcohol	107-18-6	5	Methyl Chlorobenzene	78-22-1	1000
Antimony	7440-38-0	0.3	Methyl Ethyl Ketone	78-93-3	80
Barium	7440-39-3	50	Methyl Parathion	298-00-0	0.3
Bromomethane	74-83-9	50	Nickel Cyanide	557-19-7	20
Calcium Cyanide	542-82-1	0.8	Nitric Oxide	10102-43-9	100
Carbon Disulfide	75-15-0	200	Nitrobenzene	98-95-3	0.8
Chloral	75-87-6	2	Pentachlorobenzene	609-83-6	0.8
Chlorine (free)	75-08-0	0.4	Pentachlorophenol	87-86-5	30
Chloro-1,3-butadiene	126-99-8	3	Phenol	108-96-2	5
Chromium III	16065-83-1	1000	M-Phenylmethanamine	108-45-2	0.075
Copper Cyanide	544-92-3	5	Phenylmercuric Acetate	62-38-4	0.075
Cresols	1319-77-3	50	Phosphine	7803-51-2	0.005
Cumene	98-82-9	1	Phthalic Anhydride	85-44-9	200
Cyanogen	57-12-15	20	Potassium Cyanide	151-50-8	50
Cyanogen Bromide	460-19-5	30	Potassium Silver Cyanide	506-61-6	200
Dibutyl Phthalate	508-68-3	80	Pyridine	110-86-1	50
Dichlorobenzene	84-74-2	100	Selenious Acid	7783-80-8	10
Dichlorodifluoromethane	106-46-7	10	Selenosulfuric Acid	530-10-4	10
Dichlorophenol	120-83-2	3	Silver	7440-22-4	100
Diethyl Phthalate	84-66-2	800	Silver Cyanide	506-64-9	100
Dimethyl Sulfide	60-51-5	0.8	Sodium Cyanide	143-33-9	30
Dinitrophenol	88-85-7	0.9	Strychnine	57-24-9	0
Dioxane	122-36-4	20	1,2,4,5-Tetrachlorobenzene	95-94-3	0
Diphenylamine	115-29-1	0.05	2,3,4,6-Tetrachlorophenol	50-80-2	30
Endosulfan	72-20-8	0.3	2,3,4,6-Tetrachlorophenol	78-00-2	10
Endrin	7882-41-4	50	Tetraethyl Lead	109-98-9	10
Fluorine	7723-71-4	2000	Thallous Oxide	1314-32-5	0
Formic Acid	7665-34-4	5	Thallium	7440-28-0	0
Glycidoldehyde	77-47-4	0.3	Thallium (I) Acetate	563-68-8	0
Hexachlorocyclopentadiene	70-30-4	0.3	Thallium (I) Carbonate	6533-73-9	0
Hexachlorocyclopentadiene	70-30-4	0.3	Thallium (I) Chloride	7791-12-0	0
Hydrocyanic Acid	74-85-0	7	Thallium (I) Nitrate	10102-45-1	0
Hydrogen Chloride	7782-01-1	300	Thallium Selenite	12039-32-0	0
Hydrogen Sulfide	7782-06-4	300	Thallium (II) Sulfate	7446-18-6	0.07
Isobutyl Alcohol	78-83-1	300	Thiam	137-26-8	30
Lead	7439-92-1	0.09	Toluene	108-88-3	20
Maleic Anhydride	108-31-6	100	1,2,4-Trichlorobenzene	120-82-1	30
Mercury	7439-97-6	0.3	Trichloromethane	75-86-0	300
Methacrylonitrile	126-98-7	0.1			
Methoxychlor	1652-77-5	20			
Methyl Chloroformate	72-43-6	50			
Methyl Chlorobenzene	78-22-1	80			
Methyl Ethyl Ketone	78-93-3	0.3			
Methyl Parathion	298-00-0	0.3			
Nickel Cyanide	557-19-7	20			
Nitric Oxide	10102-43-9	100			
Nitrobenzene	98-95-3	0.8			
Pentachlorobenzene	609-83-6	0.8			
Pentachlorophenol	87-86-5	30			
Phenol	108-96-2	5			
M-Phenylmethanamine	108-45-2	0.075			
Phenylmercuric Acetate	62-38-4	0.075			
Phosphine	7803-51-2	0.005			
Phthalic Anhydride	85-44-9	200			
Potassium Cyanide	151-50-8	50			
Potassium Silver Cyanide	506-61-6	200			
Pyridine	110-86-1	50			
Selenious Acid	7783-80-8	10			
Selenosulfuric Acid	530-10-4	10			
Silver	7440-22-4	100			
Silver Cyanide	506-64-9	100			
Sodium Cyanide	143-33-9	30			
Strychnine	57-24-9	0			
1,2,4,5-Tetrachlorobenzene	95-94-3	0			
2,3,4,6-Tetrachlorophenol	50-80-2	30			
2,3,4,6-Tetrachlorophenol	78-00-2	10			
Tetraethyl Lead	109-98-9	10			
Thallous Oxide	1314-32-5	0			
Thallium	7440-28-0	0			
Thallium (I) Acetate	563-68-8	0			
Thallium (I) Carbonate	6533-73-9	0			
Thallium (I) Chloride	7791-12-0	0			
Thallium (I) Nitrate	10102-45-1	0			
Thallium Selenite	12039-32-0	0			
Thallium (II) Sulfate	7446-18-6	0.07			
Thiam	137-26-8	30			
Toluene	108-88-3	20			
1,2,4-Trichlorobenzene	120-82-1	30			
Trichloromethane	75-86-0	300			

APPENDIX IV TO PART 266—REFERENCE AIR CONCENTRATIONS*—Continued

Constituent	CAS No.	RAC (µg/m³)
2,4,5-Trichlorophenol	95-95-4	100
Vanadium Pentoxide	1314-62-1	20
Warfarin	81-81-2	0.3
Xylenes	1330-20-7	80
Zinc Cyanide	557-21-1	50

APPENDIX IV TO PART 266—REFERENCE AIR CONCENTRATIONS*—Continued

Constituent	CAS No.	RAC (µg/m³)
Zinc Phosphide	1314-94-7	0.3

*The RAC for other appendix VIII part 261 constituents not listed herein or in appendix V of this part is 0.1 µg/m³.

[56 FR 7233, Feb. 21, 1991; 56 FR 32691, July 17, 1991]

APPENDIX V TO PART 266—RISK SPECIFIC DOSES (10⁻⁵)

Constituent	CAS No.	Unit risk (m³/ug)	RSD (µg/m³)
Acrylonitrile	79-06-1	1.3E-03	7.7E-03
Arylonitrile	107-13-1	6.8E-05	1.5E-01
Adrin	309-00-2	4.9E-03	2.0E-03
Aniline	62-53-3	7.4E-06	1.4E-00
Arsenic	7440-38-2	4.3E-03	2.3E-03
Benz(a)anthracene	56-55-3	8.9E-04	1.1E-02
Benzene	71-43-2	8.3E-06	1.2E-00
Benzidine	92-87-5	6.7E-02	1.5E-04
Benz(a)pyrene	50-32-8	2.4E-03	3.0E-03
Beryllium	7440-41-7	3.3E-04	3.0E-02
Bis(chloromethyl)ether	542-68-1	6.2E-02	1.0E-04
Bis(chloromethyl)phenyl ether	117-81-7	2.4E-07	4.2E-01
Bis(2-ethylhexyl)phthalate	109-69-0	2.9E-04	3.6E-02
1,3-Butadiene	7440-43-9	1.9E-03	5.6E-03
Cadmium	59-23-5	1.3E-05	8.7E-01
Carbon Tetrachloride	57-74-9	3.7E-04	2.7E-02
Chlordane	67-66-3	2.3E-05	4.3E-01
Chlorobenzene	7440-47-3	1.2E-02	8.3E-04
Chromium VI	50-29-3	9.7E-05	1.0E-01
DDT	53-70-3	1.4E-02	7.1E-04
Dibenz(a,h)anthracene	98-12-9	6.3E-03	1.6E-03
1,2-Dibromo-3-chloropropane	106-93-4	2.2E-04	4.5E-02
1,2-Dibromomethane	75-34-3	2.8E-05	3.8E-01
1,1-Dichloroethane	107-06-2	2.8E-05	3.8E-01
1,2-Dichloroethane	542-75-6	3.5E-01	2.0E-01
1,1-Dichloroethylene	60-57-1	4.6E-03	2.2E-03
1,3-Dichloropropane	58-53-1	1.4E-01	7.1E-05
Dieldrin	82-75-9	8.9E-05	1.1E-01
Dibutyltin dioxide	122-69-7	2.2E-04	4.5E-02
Dimethyltin dichloride	123-91-1	1.4E-06	7.1E+00
2,4-Dinitrochlorobenzene	106-89-9	1.2E-06	8.3E+00
1,2-Dinitroethane	75-21-8	1.0E-04	1.0E-01
1,2-Dinitrohydrazine	106-83-4	2.2E-04	4.5E-02
1,4-Dioxane	50-00-0	1.3E-05	7.7E-03
Epichlorohydrin	78-44-9	1.3E-03	7.7E-03
Ethylene Oxide	107-08-3	2.8E-03	3.8E-03
Ethylene Dichloride	119-74-1	4.0E-04	2.0E-02
Formaldehyde	50-00-0	2.0E-05	5.0E-01
Heptachlor Epoxide	319-84-6	1.8E-03	5.6E-03
Heptachlorobenzene	319-85-7	5.3E-04	1.9E-02
Heptachlorocyclopentadiene	58-89-9	3.6E-04	2.6E-02
Heptachlorocyclohexane	58-89-9	3.6E-04	2.6E-02
Heptachlorocyclohexene	58-89-9	3.6E-04	2.6E-02
Heptachlorocyclopentadiene, Technical	58-89-9	3.6E-04	2.6E-02
Heptachlorocyclopentadiene, Technical (1:2 Mixture)	58-89-9	3.6E-04	2.6E-02
Hydrazine	50-00-0	1.3E+00	7.7E-06
Hydrazine Sulfate	302-01-2	4.0E-08	2.5E+00
3-Methylcholanthrene	302-01-2	2.8E-03	3.4E-03
Methyl Hydrazine	50-00-0	2.8E-03	3.4E-03
Methylene Chloride	60-34-4	3.1E-04	3.2E-02
4,4'-Methylene-bis-2-chloroaniline	101-14-4	4.1E-06	2.4E+00
Nickel	7440-02-0	4.7E-05	2.1E-01
Nickel Refractory Dust	7440-02-0	2.4E-04	4.2E-02
Nickel Sulfide	12035-72-2	4.6E-04	2.1E-02

APPENDIX V TO PART 266—RISK SPECIFIC DOSES (10⁻⁵)—Continued

Constituent	CAS No.	Unit risk (m³/ug)	RSD (µg/m³)
2-Nitropropane	79-46-9	2.7E-02	3.7E-04
N-Nitroso-N-butyamine	924-16-3	1.0E-03	6.3E-03
N-Nitroso-N-methylurea	664-93-5	8.9E-02	1.2E-04
N-Nitrosodimethylamine	55-18-5	4.3E-02	2.3E-04
N-Nitrosopyrrolidine	830-55-2	6.1E-04	1.4E-02
Pentachloronitrobenzene	82-69-8	7.3E-06	1.4E-01
PCBs	1336-36-3	1.2E-03	8.3E-03
Propamide	23950-58-5	4.8E-06	2.2E+00
Reserpine	50-55-5	3.0E-03	3.3E-03
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	4.5E+01	2.2E-07
1,1,2,2-Tetrachloroethane	78-34-5	5.9E-06	1.7E-01
Tetrachloroethylene	127-18-4	4.8E-07	2.1E-01
Thiourea	62-58-9	5.5E-04	1.0E-02
1,1,2-Trichloroethane	79-00-5	1.9E-05	6.3E-01
Trichloroethylene	79-01-6	1.3E-06	7.7E+00
2,4,6-Trichlorophenol	88-06-2	5.7E-06	1.6E+00
Toraphene	8001-35-2	3.2E-04	3.1E-02
Vinyl Chloride	75-01-4	7.1E-06	1.4E+00

[56 FR 7233, Feb. 21, 1991]

APPENDIX VI TO PART 266—STACK PLUME RISE
(Estimated Plume Rise (in Meters) Based on Stack Exit Flow Rate and Gas Temperature)

Flow rate (m3/s)	Exhaust Temperature (K°)										
	<325	325-349	350-399	400-449	450-499	500-599	600-699	700-799	800-999	1000-1499	>1499
<0.5	0	0	0	0	0	0	0	0	0	0	0
0.5-0.9	0	0	0	0	0	0	0	0	0	0	0
1.0-1.9	0	0	0	0	0	0	0	0	0	0	0
2.0-2.9	0	0	0	0	0	0	0	0	0	0	0
3.0-3.9	0	0	0	0	0	0	0	0	0	0	0
4.0-4.9	0	0	0	0	0	0	0	0	0	0	0
5.0-7.4	0	0	0	0	0	0	0	0	0	0	0
7.5-9.9	0	0	0	0	0	0	0	0	0	0	0
10.0-12.4	0	0	0	0	0	0	0	0	0	0	0
12.5-14.9	0	0	0	0	0	0	0	0	0	0	0
15.0-18.9	0	0	0	0	0	0	0	0	0	0	0
20.0-24.9	0	0	0	0	0	0	0	0	0	0	0
25.0-29.9	0	0	0	0	0	0	0	0	0	0	0
30.0-34.9	0	0	0	0	0	0	0	0	0	0	0
35.0-39.9	0	0	0	0	0	0	0	0	0	0	0
40.0-49.9	0	0	0	0	0	0	0	0	0	0	0
50.0-59.9	0	0	0	0	0	0	0	0	0	0	0
60.0-69.9	0	0	0	0	0	0	0	0	0	0	0
70.0-79.9	0	0	0	0	0	0	0	0	0	0	0
80.0-89.9	0	0	0	0	0	0	0	0	0	0	0
90.0-99.9	0	0	0	0	0	0	0	0	0	0	0
100.0-119.9	0	0	0	0	0	0	0	0	0	0	0
120.0-139.9	0	0	0	0	0	0	0	0	0	0	0
140.0-159.9	0	0	0	0	0	0	0	0	0	0	0
160.0-179.9	0	0	0	0	0	0	0	0	0	0	0
180.0-199.9	0	0	0	0	0	0	0	0	0	0	0
>199.9	0	0	0	0	0	0	0	0	0	0	0

[56 FR 7233, Feb. 21, 1991]

APPENDIX VII TO PART 266—HEALTH-BASED LIMITS FOR EXCLUSION OF WASTE-DERIVED RESIDUES*

METALS—TCLP EXTRACT CONCENTRATION LIMITS

Constituent	CAS No.	Concentration limits (mg/L)
Antimony	7440-36-0	1E+00
Arsenic	7440-38-2	5E+00
Bismuth	7440-39-3	1E+02
Beryllium	7440-41-7	1E+03
Cadmium	7440-43-9	1E+00
Chromium	7440-47-3	5E+00
Copper	7440-50-9	5E+00
Lead	7439-92-1	5E+00
Mercury	7439-97-6	2E-01
Nickel	7440-02-0	7E+01
Selenium	7782-49-2	1E+00
Silver	7440-22-4	5E+00
Thallium	7440-28-0	7E+00

NONMETALS—RESIDUE CONCENTRATION LIMITS

Constituent	CAS No.	Concentration limits for residues (mg/kg)
Acetonitrile	75-05-8	2E-01
Acetophenone	98-96-2	4E+00
Acrolein	107-02-6	5E-01
Acrylonitrile	79-108-1	2E-04
Acrylonitrile	79-108-1	2E-04
Adren	309-00-2	2E-05
Allyl alcohol	107-18-6	2E-01
Aluminum phosphide	20859-73-8	1E-02
Aniline	62-53-3	6E-02
Benzaldehyde	542-82-1	1E+00
Benzotriazole	45-55-3	1E+04
Benzene	71-43-2	5E-03
Benzene	92-87-5	1E-06
Bis(2-chloroethyl) ether	111-44-4	3E-04
Bis(chloromethyl) ether	542-88-1	2E-06
Bis(2-ethylhexyl) phthalate	117-81-7	3E+01
Bromomethane	75-25-2	7E-01
Calcium cyanide	592-01-8	1E-06
Carbon disulfide	75-15-0	4E+00
Carbon tetrachloride	56-23-6	5E-03
Chlorobenzene	108-90-7	1E+00
Chloroform	67-66-3	6E-02
Copper cyanide	544-92-3	2E-01
Cresols (Cresylic acid)	1319-77-3	2E+00
Cyanogen	460-19-5	1E+00
Dibenzil	50-29-3	1E-03
Dibenzil	53-70-3	7E-06
1,2-Dibromo-3-chloropropane	96-12-8	2E-05
p-Dichlorobenzene	106-46-7	7E+02
Dichlorodifluoromethane	75-71-8	5E-03
1,1-Dichloroethane	75-35-4	5E-03
2,4-Dichlorophenol	120-83-2	1E-01
1,3-Dichloropropane	542-75-6	1E-03
Dieldrin	60-57-1	2E-05
Diethyl phthalate	84-66-2	3E+01
Dimethylbenzylidene	56-53-1	7E-07
Dimethoxymethane	60-51-6	3E-02
2,4-Dinitrochlorobenzene	121-14-2	5E-04
Diphenylamine	122-39-4	9E-01
1,2-Diphenylhydrazine	115-29-7	5E-04
Endosulfan	72-20-8	2E-03
Epichlorohydrin	106-89-6	4E-02
Ethylene dichloride	106-83-4	4E-07
Ethylene oxide	75-21-8	3E-04

NONMETALS—RESIDUE CONCENTRATION LIMITS—Continued

Constituent	CAS No.	Concentration limits for residues (mg/kg)
Fluoric acid	7782-41-4	4E+00
Formic acid	64-18-6	7E+01
Heptachlor	74-48-8	8E-05
Heptachlor epoxide	1024-57-3	4E-05
Hexachlorobenzene	118-74-1	2E-04
Hexachlorocyclopentadiene	87-68-3	5E-03
Hexachlorocyclopentadiene	77-47-4	2E-01
Hexachlorocyclopentadiene	19408-74-3	6E-08
Hydrazine	67-72-1	3E-02
Hydrogen cyanide	302-01-1	1E-04
Hydrogen sulfide	74-90-8	7E-05
Isobutyl alcohol	78-03-1	1E+01
Methanol	67-58-3	1E+00
Methoxychlor	18752-77-5	1E+00
3-Methoxychlorobenzene	72-43-5	1E-01
4,4'-Methylenebis(2-chloroaniline)	59-49-5	4E-05
Methylene chloride	101-14-4	2E-03
Methyl ethyl ketone (MEK)	78-09-2	5E-02
Methyl hydrazine	78-93-3	2E+00
Methyl parathion	60-34-4	3E-04
Naphthalene	298-00-0	2E-02
Nickel cyanide	91-20-3	1E+01
Nickel oxide	537-19-7	7E-01
Nitrobenzene	10102-43-9	4E+00
N-Nitrosodimethylamine	98-95-3	2E-02
N-Nitrosodiphenylamine	924-18-3	6E-05
N-Nitrosodiphenylamine	55-18-5	1E-07
N-Nitrosodiphenylamine	684-93-5	1E-07
N-Nitrosodiphenylamine	900-55-2	2E-04
Pentachloronitrobenzene	608-93-5	3E-02
Pentachloronitrobenzene (PCNB)	82-68-8	1E-01
Pentachlorophenol	87-86-5	1E+00
Phenol	108-96-2	1E+00
Phenylmercury acetate	62-38-4	3E-03
Phosphine	7803-51-2	1E-02
Polychlorinated biphenyls, N.O.S.	1336-36-3	5E-05
Potassium cyanide	151-50-8	2E+00
Potassium silver cyanide	506-61-6	7E+00
Promethide	23950-59-5	3E+00
Pyridine	110-86-1	4E-02
Reserpine	50-55-5	3E-05
Selenourea	630-10-4	2E-01
Silver cyanide	506-64-9	4E+00
Sodium cyanide	143-33-9	1E+00
Silychene	57-24-9	1E-02
Styrene	95-94-3	1E-02
1,2,4,5-Tetrachlorobenzene	79-34-5	1E-03
1,1,2,2-Tetrachloroethane	127-18-4	7E-01
Tetrachloroethylene	58-90-2	1E-02
2,3,4,6-Tetrachlorophenol	78-00-2	4E-06
Tetramethyl lead	62-56-6	2E-04
Toluene	108-88-3	1E+01
Tosaphene	8001-35-2	5E-03
1,2-Trichloroethane	79-00-6	6E-03
Trichloroethylene	79-01-6	5E-03
Trichloromethylmethane	75-69-4	1E+01
2,4,5-Trichlorophenol	95-95-4	4E+00
2,4,6-Trichlorophenol	88-06-2	4E+00
Venadium pentoxide	1314-62-1	7E-01
Vinyl chloride	75-01-4	2E-03

* NOTE 1: The health-based concentration limits for appendix VIII part 261 constituents for which a health-based concentration is not provided below is 2x1E-06 mg/kg.

NOTE 2: The levels specified in this appendix and the default level of 0.002 micrograms per kilogram or the level of detection for constituents as identified in Note 1 of this appendix are administratively stayed under the condition, for those constituents specified in §266.112(b)(1), that the owner or operator complies with alternative levels defined as the land disposal restriction limits specified in §268.43 of this chapter for F039 nonwastewater. See §266.112(b)(2)(i).

[56 FR 7234, Feb. 21, 1991; 56 FR 32691, July 17, 1991, as amended at 56 FR 59603, Nov. 9, 1993]

APPENDIX VIII TO PART 266—POTENTIAL PICS FOR DETERMINATION OF EXCLUSION OF WASTE-DERIVED RESIDUES

PICS FOUND IN STACK EFFLUENTS

Volatiles	Semi-volatiles
Benzene	Bis(2-ethylhexyl)phthalate
Toluene	Naphthalene
Carbon tetrachloride	Phenol
Chloroform	Diethyl phthalate
Methylene chloride	Butyl benzyl phthalate
Trichloroethylene	2,4-Dimethylphenol
Tetrachloroethylene	o-Dichlorobenzene
1,1,1-Trichloroethane	p-Dichlorobenzene
Chlorobenzene	Hexachlorobenzene
cis-1,4-Dichloro-2-butene	2,4,6-Trichlorophenol
Bromochloromethane	Fluoranthene
Bromodichloromethane	o-Nitrophenol
Bromomethane	1,2,4-Trichlorobenzene
Methylene bromide	o-Chlorophenol
Diethyl ethyl ketone	Pentachlorophenol
	Pyrene
	Diethyl phthalate
	Monochlorobenzene
	2,6-Toluene dicarbonyl

[56 FR 7235, Feb. 21, 1991; 56 FR 32691, July 17, 1991]

APPENDIX IX TO PART 266—METHODS MANUAL FOR COMPLIANCE WITH THE BIF REGULATIONS

Burning Hazardous Waste in Boilers and Industrial Furnaces

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SECTION 1.0 INTRODUCTION

This document presents required methods for demonstrating compliance with U.S. Environmental Protection Agency regulations

- 3.1 Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes
- 3.2 Determination of Hexavalent Chromium Emissions from Stationary Sources (Method Cr-*)
- 3.3 Measurement of HCl and Cl₂
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- 3.4 Determination of Polychlorinated Dibenzop-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) from Stationary Sources (Method 23)
- 3.5 Sampling for Aldehyde and Ketone Emissions from Stationary Sources (Method 0011)
- 3.6 Analysis for Aldehydes and Ketones by High Performance Liquid Chromatography (HPLC) (Method 0011A)
- 4.0 Procedure for Estimating Toxicity Equipment or Chlorinated Dibenzop-dioxin and Dibenzofuran Congeners
- 5.0 Hazardous Waste Combustion Air Quality Screening Procedure
- 6.0 Simplified Land Use Classification Procedure for Compliance With Tier 1 and Tier II Limits
- 7.0 Statistical Methodology for Bevill Residue Determinations
- 8.0 Procedures for Determining Default Values for Air Pollution Control System Removal Efficiencies
- 8.1 APCS RE Default Values for Metals
- 8.2 APCS RE Default Values for HCl and Cl₂
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- 9.0 Procedures for Determining Default Values for Partitioning of Metals, Ash, and Total Chloride/Chlorine
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- 10.3 Basis
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- 10.5 Implementation Procedures
- 10.6 Precompliance Procedures
- Appendix A—Statistics

for boilers and industrial furnaces (BIFs) burning hazardous waste (see 40 CFR part 266, subpart H). Included in this document are:

1. Performance Specifications for Continuous Emission Monitoring (CEM) of Carbon Monoxide, Oxygen, and Hydrocarbons in Stack Gases.
2. Sampling and Analytical (S&A) Methods for Multiple Metals, Hexavalent Chromium, HCl and Chlorine, Polychlorinated Dibenzodioxins and Dibenzofurans, and Aldehydes and Ketones.
3. Procedures for Estimating the Toxicity Equivalency of Chlorinated Dibenzodioxin and Dibenzofuran Congeners.
4. Hazardous Waste Combustion Air Quality Screening Procedures (HWCQSP).
5. Simplified Land Use Classification Procedure for Compliance with Tier I and Tier II Limits.
6. Statistical Methodology for Bevilacqua Determinations.
7. Procedures for Determining Default Values for Air Pollution Control System Removal Efficiencies.
8. Procedures for Determining Default Values for Partitioning of Metals, Ash, and Total Chloride/Chlorine.
9. Alternate Methodology for Implementing Metals Controls.

Additional methods referenced in subpart H of part 266 but not included in this document can be found in 40 CFR parts 60 and 61.

and "Test Methods for Evaluating Solid Wastes, Physical/Chemical Methods" (SW-846). The CEM performance specifications of section 2.0, the S&A methods of section 3.0 and the toxicity equivalency procedure for dioxins and furans of section 4.0 are required procedures for determining compliance with BIF regulations. The CEM performance specifications and the S&A methods are interim. The finalized CEM performance specifications and methods will be published in SW-846 or 40 CFR parts 60 and 61.

SECTION 2.0 PERFORMANCE SPECIFICATIONS FOR CONTINUOUS EMISSION MONITORING SYSTEMS

2.1 *Performance Specifications for Continuous Emission Monitoring of Carbon Monoxide and Oxygen for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste*

2.1.1 Applicability and Principle

2.1.1.1 *Applicability.* These performance specifications apply to carbon monoxide (CO) and oxygen (O₂) continuous emission monitoring systems (CEMSs) installed on incinerators, boilers, and industrial furnaces burning hazardous waste. The specifications include procedures which are intended to be used to evaluate the acceptability of the CEMS at the time of its installation or

whenever specified in regulations or permits. The procedures are not designed to evaluate CEMS performance over an extended period of time. The source owner or operator is responsible for the proper calibration, maintenance, and operation of the CEMS at all times.

2.1.1.2 *Principle.* Installation and measurement location specifications, performance and equipment specifications, test and data reduction procedures, and brief quality assurance guidelines are included in the specifications. Calibration drift, relative accuracy, calibration error, and response time tests are conducted to determine conformance of the CEMS with the specifications.

2.1.2 Definitions

2.1.2.1 *Continuous Emission Monitoring System (CEMS).* A continuous monitor is one in which the sample to be analyzed passes the measurement section of the analyzer without interruption, and which evaluates the detector response to the sample at least once each 15 seconds and computes and records the results at least every 60 seconds. A CEMS consists of all the equipment used to acquire data and includes the sample extraction and transport hardware, the analyzer, and the data recording/processing hardware and software.

2.1.2.2 *Monitoring System Types.* The specifications require CEMSs capable of accepting calibration gases. Alternative system designs may be used if approved by the Regional Administrator. There are two basic types of monitoring systems: extractive and in-situ.

2.1.2.2.1 *Extractive.* Systems that use a pump or other mechanical, pneumatic, or hydraulic means to draw a sample of the stack or flue gas and convey it to a remotely located analyzer.

2.1.2.2.2 *In-situ.* Systems that perform an analysis without removing a sample from the stack. Point in-situ analyzers place the sensing or detecting element directly in the flue gas stream. Cross-stack in-situ analyzers measure the parameter of interest by placing a source beam on one side of the stack and the detector (in single-pass instruments) or a retroreflector (in double-pass instruments) on the other side, and measuring the parameter of interest (e.g., CO) by the attenuation of the beam by the gas in its path.

2.1.2.3 *Instrument Measurement Range.* The difference between the minimum and maximum concentration that can be measured by a specific instrument. The minimum is often stated or assumed to be zero and the range expressed only as the maximum.

2.1.2.4 *Span or Span Value.* Full scale instrument measurement range.

2.1.2.5 *Calibration Drift (CD).* The difference in the CEMS output readings from the established reference value after a stated

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period of operation during which no unscheduled maintenance, repair, or adjustment takes place. A CD test is performed to demonstrate the stability of the CEMS calibration over time.

2.1.2.6 *Response Time.* The time interval between the start of a step change in the system input (e.g., change of calibration gas) and the time when the data recorder displays 95 percent of the final value.

2.1.2.7 *Accuracy.* A measure of agreement between a measured value and an accepted or true value, expressed as the percentage difference between the true and measured values relative to the true value. For these performance specifications, accuracy is checked by conducting a calibration error (CE) test and a relative accuracy (RA) test. Certain facilities, such as those using solid waste or batch-fed processes, may observe long periods of almost no CO emissions with brief, high-level CO emission spikes. These facilities, as well as facilities whose CO emissions never exceed 5-10 ppm, may need to be exempted from the RA requirement because the RA test procedure cannot ensure acquisition of meaningful test results under these conditions. An alternative procedure for accuracy determination is described in section 2.1.9.

2.1.2.8 *Calibration Error (CE).* The difference between the concentration indicated by the CEMS and the known concentration of the cylinder gas. A CE test procedure is performed to document the accuracy and linearity of the monitoring equipment over the entire measurement range.

2.1.2.9 *Relative Accuracy (RA).* A comparison of the CEMS response to a value measured by a performance test method (PTM). The PA test is used to validate the calibration technique and verify the ability of the CEMS to provide representative and accurate measurements.

2.1.2.10 *Performance Test Method (PTM).* The sampling and analysis procedure used to obtain reference measurements for comparison to CEMS measurements. The applicable test methods are Method 10, 10A, or 10B (for the determination of CO) and Method 3 or 3A (for the determination of O₂). These methods are found in 40 CFR part 60, appendix A.

2.1.2.11 *Performance Specification Test (PST) Period.* The period during which CD, CE, response time, and RA tests are conducted.

2.1.2.12 *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.

2.1.3 Installation and Measurement Location Specifications

2.1.3.1 *CEMS Installation and Measurement Locations.* The CEMS shall be installed in a location in which measurements rep-

resentative of the source's emissions can be obtained. The optimum location of the sample interface for the CEMS is determined by a number of factors, including ease of access for calibration and maintenance, the degree to which sample conditioning will be required, the degree to which it represents total emissions, and the degree to which it represents the combustion situation in the firebox. The location should be as free from in-leakage influences as possible and reasonably free from severe flow disturbances. The sample location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs and at least 0.5 diameter upstream from the exhaust or control device. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, method 1, section 2.1. If these criteria are not achievable or if the location is otherwise less than optimum, the possibility of stratification should be checked as described in Section 2.1.3.3 to determine whether the location would cause failure of the relative accuracy test.

2.1.3.1.1 *For extractive or point in-situ CEMSs,* the measurement point should be within or centrally located over the centroidal area of the stack or duct cross section.

2.1.3.1.2 *For cross-stack CEMSs,* the effective measurement path should (1) have at least 70 percent of the path within the inner 50 percent of the stack or duct cross-sectional area or (2) be centrally located over any part of the centroidal area.

2.1.3.1.3 *Both the CO and O₂ monitors* should be installed at the same general location. If this is not possible, they may be installed at different locations if the effluent gases at both sample locations are not stratified and there is no in-leakage of air between sampling locations.

2.1.3.2 *Performance Test Method (PTM) Measurement Location and Traverse Points.*

2.1.3.2.1 *Select an accessible PTM measurement point at least two equivalent diameters downstream from the nearest control device, the point of CO generation, or other point at which a change in the CO concentration 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 leakage) and CO and O₂ are simultaneously measured at the same location, one half diameter may be used in place of two equivalent diameters. The CEMS and PTM locations need not be the same.

2.1.3.2.2 *Select traverse points that ensure acquisition of representative samples over the stack or duct cross section.* At a minimum, establish a measurement line that passes through the centroidal area in the di-

rection of any expected stratification. If this line interferes with the CEMS measurements, displace the line up to 30 cm for 5 percent of the equivalent diameter of the cross section, whichever is less) from the control area. Locate three traverse points at 17, 50, and 83 percent of the measurement line. If the measurement line is no 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 at a site located within eight equivalent diameters downstream of a flow disturbance. 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 PPM tests within 3 cm of the selected traverse points. Sampling must not be performed within 3 cm of the duct or stack inner wall.

2.1.3.3 Stratification Test Procedure. Stratification is defined as a difference in excess of 10 percent between the average concentration in the duct or stack and the concentration at any point more than 1.0 meter from the duct or stack wall. To determine whether effluent stratification exists, a dual probe system should be used to determine the average effluent concentration while measurements at each traverse point are being made. One probe, located at the stack or duct control, is used as a stationary reference point to indicate the change in effluent concentration over time. The second probe is used for sampling at the traverse points specified in method 1, appendix A, 40 CFR part 60. The monitoring system samples sequentially at the reference and traverse points throughout the testing period for five minutes at each point.

2.1.4 CEMS Performance and Equipment Specifications

Table 2.1-1 summarizes the performance specifications for the CEMS. Two sets of standards for CO are given: one for low-range and another for high-range measurements. The high-range specifications relate to measurement and quantification of short duration high concentration peaks, while the low-range specifications relate to the overall average operating condition of the burning device. The dual-range specifications can be met by using (1) one analyzer for each range, (2) a dual range unit, or (3) a single measurement range instrument capable of meeting both specifications with a single unit. Adjustments cannot be made to the analyzer between determinations of low- and high-level accuracy within the single measurement range. In the second case, when the concentration exceeds the span of the lower range, the data acquisition system recorder shall switch to the high range automatically.

2.1.4.1 CEMS Span Value. In order to measure high and low concentrations with the same or similar degree of accuracy, the maximum ranges (span values) are specified for low and high range analyzers. The span values are listed in Table 2.1-2. Tier I and Tier II format definitions are established in 40 CFR part 266, subpart H.

TABLE 2.1-1—Performance Specifications of CO and O₂ Monitors

Parameter	CO monitors		O ₂ monitors
	Low range	High range	
Calibration drift 24 hours	<6 ppm ¹ <90 ppm		<0.5% O ₂
Calibration error	<10 ppm ¹ <150 ppm		<0.5% O ₂
Response time	<2 min <2 min		<2 min
Relative accuracy ²	(?) (?)	(?)	(incorporated in CO RA calculation)

¹ For Tier II, CO and CE are <3% and <5% of twice the permit limit, respectively.

² Expressed as the sum of the mean absolute value plus the 95% confidence interval of a series of measurements.

³ The greater of 10% of PPM or 10 ppm.

TABLE 2.1-2—CEMS Span Values for CO and O₂ Monitors

	CO monitors		O ₂ monitors (percent)
	Low range (ppm)	High range (ppm)	
Tier I rolling average formal	200 2 × permit limit	3,000	25
Tier II rolling average formal	2 × permit limit	3,000	25

2.1.4.2 Daily Calibration Gas Values. The owner or operator must choose calibration gas concentrations (or calibration filters for in-situ systems) that include zero and high-level calibration values for the daily calibration checks. For a single measurement range monitor, three CO calibration gas concentrations (or calibration filters for in-situ systems) shall be used, i.e., the zero and high-level concentrations of the low-range CO analyzer and the high-level concentration of the high-range CO analyzer.

2.1.4.2.1 The zero level for the CO or O₂ analyzer may be between zero and 20 percent of the span value, e.g., 0-40 ppm for low-range CO analyzer, 0-600 ppm for the high-range CO analyzer, and 0-5 percent for the O₂ analyzer (for Tier I).

2.1.4.2.2 The high-level concentration for the CO or O₂ analyzer shall be between 50 and 90 percent of the span value, i.e., 100-180 ppm for the low-range CO analyzer, 1500-2700 ppm for the high-range CO analyzer, and 12.5-22.5 percent O₂ for the O₂ analyzer.

2.1.4.3 Data Recorder Scale. The strip chart recorder, computer, or digital recorder must be capable of recording all readings within the CEMS's measurement range and shall have a resolution of 0.5 percent of span value, i.e., 1 ppm CO for low-range CO analyzer, 15 ppm CO for high-range CO analyzer, and 0.1 percent O₂ for the O₂ analyzer.

2.1.4.4 Response Time. The response time for the CO or O₂ monitor shall not exceed 2 minutes to achieve 95 percent of the final stable value.

2.1.4.5 Calibration Drift. The CEMS must allow the determination of CD at the zero and high-level values. The CD must be determined separately for CO and O₂ monitors in terms of concentration. The CO CEMS calibration response must not drift or deviate from the reference value of the calibration gas (or calibration filters for in-situ systems) by more than 3 percent of the span value after each 24-hour period of the 7-day test, i.e., 6 ppm CO for the low-range analyzer (Tier I) and 90 ppm for the high-range analyzer, at both zero and high levels. The O₂ monitor calibration response must not drift or deviate from the reference value by more than 0.5 percent O₂ at both zero and high levels.

2.1.4.6 Relative Accuracy. The result of the PA test of the CO CEMS (which incorporates the O₂ monitor) must be no greater than 10 percent of the mean value of the PPM results or must be within 10 ppm CO of the PPM results, whichever is less restrictive. The ppm CO concentration shall be corrected to 7 percent O₂ before calculating the RA.

2.1.4.7 Calibration Error. The mean difference between the CEMS and reference values at all three test points (see Table 2.1-3) must be no greater than 5 percent of span value for CO monitors (i.e., 10 ppm CO for low range Tier I CO analyzers and 150 ppm CO for high range CO analyzers) and 0.5 percent for O₂ analyzers.

2.1.4.8 Measurement and Recording Frequency. The sample to be analyzed shall pass through the measurement section of the analyzer without interruption. The detector shall measure the sample concentration at least once every 15 seconds. An average emission rate shall be computed and recorded at least once every 60 seconds.

2.1.4.9 Hourly Rolling Average Calculation. The CEMS shall calculate every minute an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

2.1.4.10 Retest. If the CEMS produces results within the specified criteria, the test is successful. If the CEMS does not meet one or more of the criteria, the necessary corrections must be made and the performance tests repeated.

2.1.5 Test Periods

2.1.5.1 Pretest Preparation Period. Install the CEMS, prepare the PPM test site according to the specifications in section 2.1.3, and prepare the CEMS for operation and calibration according to the manufacturer's written instructions. A pretest conditioning period similar to that of the 7-day CD test is recommended to verify the operational status of the CEMS.

2.1.5.2 Calibration Drift Test Period. While the facility is operating under normal conditions, determine the CD at 24-hour intervals for seven consecutive days according to the procedure given in section 2.1.4.1. All CD determinations must be made following a 24-hour period during which no unscheduled maintenance, repair, or adjustment takes place. If the combustion unit is taken out of service during the test period, record the onset and duration of the downtime and continue the calibration drift test when the unit resumes operation.

2.1.5.3 Relative Accuracy Test Period. Conduct the RA test according to the procedure in section 2.1.4.6 while the facility is operating under normal conditions. RA testing for CO and O₂ shall be conducted simultaneously so that the results can be calculated for CO corrected to 7 percent O₂. The RA test shall be conducted during the CD test period. It is emphasized that during the CD test period, no adjustments or repairs may be made to the CEMS other than routine calibration adjustments performed immediately following the daily CD determination.

2.1.5.4 Calibration Error Test and Response Time Test Periods. Conduct the CE and response time tests during the CD test period.

2.1.6 Performance Specification Test Procedures

2.1.6.1 Calibration Drift Test

2.1.6.1.1 Sampling Strategy. Conduct the CD test for all monitors at 24-hour intervals for seven consecutive days using calibration gases at the two (or three, if applicable) concentration levels specified in section 2.1.4.2. Introduce the calibration gases into the sampling system as close to the sampling probe outlet as practical. The gas shall pass through all filters, scrubbers, conditioners, and other CEMS components used during normal sampling. 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. Record the CEMS response and subtract this value from the reference (calibration gas) value. To meet the specification, none of the differences shall exceed the limits specified in Table 2.1-1.

2.1.6.1.2 Calculations. Summarize the results on a data sheet. An example is shown in

Figure 2.1-1. Calculate the differences between the CEMS responses and the reference values.

2.1.6.2 Response Time. Check the entire CEMS including sample extraction and transport, sample conditioning, gas analysis, and the data recording.

2.1.6.2.1 Introduce zero gas into the system. For extractive systems, introduce the calibration gases at the probe as near to the sample location as possible. For in-situ systems, introduce the zero gas at a point such 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 seconds), 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.

2.1.6.2.2 Next, introduce a high-level calibration gas and repeat the above procedure. Repeat the entire procedure three times and determine the mean upscale and downscale

response times. The longer of the two means is the system response time.

2.1.6.3 Calibration Error Test Procedure. 2.1.6.3.1 Sampling Strategy. Challenge each monitor (both low- and high-range CO and O₂) with zero gas and EPA Protocol 1 cylinder gases at three measurement points within the ranges specified in Table 2.1-3.

TABLE 2.1-3—CALIBRATION ERROR CONCENTRATION RANGES FOR TIER 1

Measurement point	Gas Concentration Ranges		O ₂ percent
	Low range ¹	High range	
1	0-40	0-800	0-2
2	80-80	900-1200	8-10
3	140-160	2100-2400	14-16

¹For Tier II, the CE specifications for the low-range CO CEMS are 0-30%, 30-40%, and 70-80% of twice the permit limit.

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER:	SPAN:

LOW RANGE	
HIGH RANGE	

	DAY	DATE	TIME	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE	PERCENT OF SPAN*
ZERO LOW LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						
HIGH LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						

*Acceptance Criteria: $\pm 5\%$ of span each day for seven days.

Figure 2.1-1 Calibration Drift Determination

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2.1.6.3.1.1 If a single measurement range is used, the calibration gases used in the daily CD checks (if they are Protocol 1 cylinder gases and meet the criteria in section 2.1.6.3.1) may be used for determining CE.

2.1.6.3.1.2 Operate each monitor in its normal sampling mode as nearly as possible. The calibration gas shall be injected into the sample system as close to the sampling probe outlet as practical and should pass through all CEMS components used during normal sampling. Challenge the CEMS three non-consecutive times at each measurement point and record the responses. The duration of each gas injection should be sufficient to ensure that the CEMS surfaces are conditioned.

2.1.6.3.2 Calculations. Summarize the results on a data sheet. An example data sheet is shown in Figure 2.1-2. Average the differences between the instrument response and the certified cylinder gas value for each gas. Calculate three CE results (five CE re-

sults for a single-range CO CEMS) according to Equation 5 (section 2.1.7.5). No confidence coefficient is used in CE calculations.

2.1.6.4 Relative Accuracy Test Procedure. 2.1.6.4.1 Sampling Strategy for PTM tests. Conduct the PTM tests in such a way that they will yield measurements representative of the emissions from the source and can be correlated to the CEMS data. Although it is preferable to conduct the CO, diluent, and moisture (if needed) simultaneously, moisture measurements that are taken within a 60-minute period which includes the simultaneous CO and O₂ measurements may be used to calculate the dry CO concentration.

NOTE: At times, CEMS RA tests may be conducted during incinerator performance tests. In these cases, PTM results obtained during CEMS RA tests may be used to determine compliance with incinerator emissions limits as long as the source and test conditions are consistent with the applicable regulations.

LOW RANGE	
HIGH RANGE	

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER:	SPAN:

RUN NUMBER	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE		
			Zero/Low	Mid	High
1 - Zero					
2 - Mid					
3 - High					
4 - Mid					
5 - Zero					
6 - High					
7 - Zero					
8 - Mid					
9 - High					
MEAN DIFFERENCE =				%	%
CALIBRATION ERROR =				%	%

2.1-2 Calibration Error Determination

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tions. Substitution of the alternative procedure requires approval of the Regional Administrator.

2.1.10 Quality Assurance (QA)

Proper calibration, maintenance, and operation of the CEMS is the responsibility of the owner or operator. The owner or operator must establish a QA program to evaluate and monitor CEMS performance. As a minimum, the QA program must include:

- 2.1.10.1 A daily calibration check for each monitor. The calibration must be adjusted if the check indicates the instrument's CD exceeds the specification established in section 2.1.4.3. The gases shall be injected as close to the probe as possible to provide a check of the entire sampling system. If an alternative calibration procedure is desired (e.g., direct injections or gas cells), subject to Administrator approval, the adequacy of this alternative procedure may be demonstrated during the initial 7-day CD test. Periodic comparisons of the two procedures are suggested.
- 2.1.10.2 A daily system audit. The audit must include a review of the recording check data, an inspection of the control panel warning lights, and an inspection of the sample transport and interface system (e.g., flowmeters, filters), as appropriate.
- 2.1.10.3 A quarterly calibration error (CE) test. Quarterly RA tests may be substituted for the CE test when approved by the Director on a case-by-case basis.
- 2.1.10.4 An annual performance specification test.

$$CE = \left| \frac{\bar{d}}{FS} \right| \times 100 \quad (\text{Eq. 5})$$

where:
 $\bar{d}$ = Mean difference between CEMS response and the known reference concentration.

2.1.8 Reporting

At a minimum, summarize in tabular form the results of the CD, RA, response time, and CE test, as appropriate. Include all data sheets, calculations, CEMS data records, and cylinder gas or reference material certifications.

2.1.9 Alternative Procedure

2.1.9.1 Alternative RA Procedure Rationale. Under some operating conditions, it may not be possible to obtain meaningful results using the RA test procedure. This includes conditions where consistent, very low CO emissions or low CO emissions interrupted periodically by short duration, high level spikes are observed. It may be appropriate in these circumstances to waive the PTM RA test and substitute the following procedure.

2.1.9.2 Alternative RA Procedure. 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, 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 must be functioning properly before the RA requirement can be waived. The instruments must also have successfully passed the CE and CD requirements of the performance specification test.

$$RA = \left| \frac{\bar{d}}{FS} \right| + \left| \frac{CC}{FS} \right| \times 100$$

$$\frac{PTM}{FS} \quad (\text{Eq. 4})$$

where:
 $\bar{d}$ = Absolute value of the mean of the differences (Equation 1).
 $|CC|$ = Absolute value of the confidence coefficient (Equation 3).
 PTM = Average reference value.

2.1.7.5 Calibration Error. Calculate CE using Equation 5.

$$CE = \left| \frac{\bar{d}}{FS} \right| \times 100 \quad (\text{Eq. 5})$$

where:
 $\bar{d}$ = Mean difference between CEMS response and the known reference concentration.

2.1.8 Reporting

At a minimum, summarize in tabular form the results of the CD, RA, response time, and CE test, as appropriate. Include all data sheets, calculations, CEMS data records, and cylinder gas or reference material certifications.

2.1.9 Alternative Procedure

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$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i \quad (\text{Eq. 1})$$

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, correct the data for moisture, if applicable.

2.1.7.2 Standard Deviation (S_d). Calculate S_d using Equation 2.

$$S_d = \sqrt{\frac{\sum_{i=1}^n d_i^2 - \frac{(\sum_{i=1}^n d_i)^2}{n}}{n-1}} \quad (\text{Eq. 2})$$

2.1.7.3 Confidence Coefficient (CC). Calculate the 2.5 percent error CC (one-tailed) using Equation 3.

$$CC = t_{0.975} \frac{S_d}{\sqrt{n}} \quad (\text{Eq. 3})$$

where:
 $t_{0.975}$ = t-value (see Table 2.1-4).

TABLE 2.1-4—t-Values

n°	t _{0.95}	n°	t _{0.95}	n°	t _{0.95}
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.

2.1.7.4 Relative Accuracy. Calculate the RA of a set of data using Equation 4.

2.1.6.4.2 Performance Test Methods.
 2.1.6.4.2.1 Unless otherwise specified in the regulations, method 3 or 3A and method 10, 10A, or 10B (40 CFR part 60, appendix A) are the test methods for O₂ and CO, respectively. Make a sample traverse of at least 21 minutes, sampling for 7 minutes at each of three traverse points (see section 3.2).

2.1.6.4.2.2 When the installed CEMS uses a nondispersive infrared (NDIR) analyzer, method 10 shall use the alternative interference trap specified in section 10.1 of the method. An option, which may be approved by the Administrator in certain cases, would allow the test to be conducted using method 10 without the interference trap. Under this option, a laboratory interference test is performed for the analyzer prior to the field test. The laboratory interference test includes the analysis of SO₂, NO, and CO₂ calibration gases over the range of expected effluent concentrations. Acceptable performance is indicated if the CO analyzer response to each of the gases is less than 1 percent of the applicable measurement range of the analyzer.

2.1.6.4.3 Number of PTM Tests. Conduct a minimum of nine sets of all necessary PTM tests. If more than nine sets are conducted, a maximum of three sets may be rejected at the tester's discretion. The total number of sets used to determine the RA must be greater than or equal to nine. All data, including the rejected data, must be reported.

2.1.6.4.4 Correlation of PTM and CEMS Data. The time and duration of each PTM test run and the CEMS response time should be considered in correlating the data. Use the CEMS final output (the one used for reporting) to determine an integrated average CO concentration for each PTM test run. Confirm that the pair of results are on a consistent moisture and O₂ concentration basis. Each integrated CEMS value should then be compared against the corresponding average PTM value. If the CO concentration measured by the CEMS is normalized to a specified diluent concentration, the PTM results shall be normalized to the same value.

2.1.6.4.5 Calculations. Summarize the results on a data sheet. Calculate the mean of the PTM values and calculate the arithmetic differences between the PTM and the CEMS data sets. The mean of the differences, standard deviation, confidence coefficient, and CEMS RA should be calculated using Equations 1 through 4.

2.1.7 Equations

2.1.7.1 Arithmetic Mean ($\bar{d}$). Calculate $\bar{d}$ the difference of a data set using Equation 1.

2.1.6.4.2 Performance Test Methods.
 2.1.6.4.2.1 Unless otherwise specified in the regulations, method 3 or 3A and method 10, 10A, or 10B (40 CFR part 60, appendix A) are the test methods for O₂ and CO, respectively. Make a sample traverse of at least 21 minutes, sampling for 7 minutes at each of three traverse points (see section 3.2).

2.1.6.4.2.2 When the installed CEMS uses a nondispersive infrared (NDIR) analyzer, method 10 shall use the alternative interference trap specified in section 10.1 of the method. An option, which may be approved by the Administrator in certain cases, would allow the test to be conducted using method 10 without the interference trap. Under this option, a laboratory interference test is performed for the analyzer prior to the field test. The laboratory interference test includes the analysis of SO₂, NO, and CO₂ calibration gases over the range of expected effluent concentrations. Acceptable performance is indicated if the CO analyzer response to each of the gases is less than 1 percent of the applicable measurement range of the analyzer.

2.1.6.4.3 Number of PTM Tests. Conduct a minimum of nine sets of all necessary PTM tests. If more than nine sets are conducted, a maximum of three sets may be rejected at the tester's discretion. The total number of sets used to determine the RA must be greater than or equal to nine. All data, including the rejected data, must be reported.

2.1.6.4.4 Correlation of PTM and CEMS Data. The time and duration of each PTM test run and the CEMS response time should be considered in correlating the data. Use the CEMS final output (the one used for reporting) to determine an integrated average CO concentration for each PTM test run. Confirm that the pair of results are on a consistent moisture and O₂ concentration basis. Each integrated CEMS value should then be compared against the corresponding average PTM value. If the CO concentration measured by the CEMS is normalized to a specified diluent concentration, the PTM results shall be normalized to the same value.

2.1.6.4.5 Calculations. Summarize the results on a data sheet. Calculate the mean of the PTM values and calculate the arithmetic differences between the PTM and the CEMS data sets. The mean of the differences, standard deviation, confidence coefficient, and CEMS RA should be calculated using Equations 1 through 4.

2.1.7 Equations

2.1.7.1 Arithmetic Mean ($\bar{d}$). Calculate $\bar{d}$ the difference of a data set using Equation 1.

5. 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, North Carolina, 27711, EPA-600/4-82-054, August 1982.

2.2 Performance Specifications for Continuous Emission Monitoring of Hydrocarbons for Incinerators, Boilers, and Industrial Furnaces Burning Hazardous Waste

2.2.1 Applicability and Principle

2.2.1.1 Applicability. These performance specifications apply to hydrocarbon (HC) continuous emission monitoring systems (CEMSs) installed on incinerators, boilers, and industrial furnaces burning hazardous waste. The specifications include procedures which are intended to be used to evaluate the acceptability of the CEMS at the time of its installation or whenever specified in regulations or permits. The procedures are not designed to evaluate CEMS performance over an extended period of time. The source owner or operator is responsible for the proper calibration, maintenance, and operation of the CEMS at all times.

2.2.1.2 Principle. A gas sample is extracted from the source through a heated sample line and heated filter (except as provided by section 2.2.10) to a flame ionization detector (FID). Results are reported as volume concentration equivalents of propane. Installation and measurement location specifications, performance and equipment specifications, test and data reduction procedures, and brief quality assurance guidelines are included in the specifications. Calibration drift, calibration error, and response time tests are conducted to determine confidence of the CEMS with the specifications.

2.2.2 Definitions

2.2.2.1 Continuous Emission Monitoring System (CEMS). The total equipment used to acquire data, which includes sample extraction and transport hardware, analyzer, data recording and processing hardware, and software. The system consists of the following major subsystems:

2.2.2.1.1 Sample Interface. That portion of the system that is used for one or more of the following: Sample acquisition, sample transportation, sample conditioning, or protection of the analyzer from the effects of the stack effluent.

2.2.2.1.2 Organic Analyzer. That portion of the system that senses organic concentration and generates an output proportional to the gas concentration.

2.2.2.1.3 Data Recorder. That portion of the system that records a permanent record of the measurement values. The data re-

order may include automatic data reduction capabilities.

2.2.2.2 Instrument Measurement Range. The difference between the minimum and maximum concentration that can be measured by a specific instrument. The minimum is often stated or assumed to be zero and the range expressed only as the maximum.

2.2.2.3 Span or Span Value. Full scale instrument measurement range.

2.2.2.4 Calibration Gas. A known concentration of a gas in an appropriate diluent gas.

2.2.2.5 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 takes place. A CD test is performed to demonstrate the stability of the CEMS calibration over time.

2.2.2.6 Response Time. The time interval between the start of a step change in the system input (e.g., change of calibration gas) and the time when the data recorder displays 95 percent of the final value.

2.2.2.7 Accuracy. A measurement of agreement between a measured value and an accepted or true value, expressed as the percentage difference between the true and measured values relative to the true value. For these performance specifications, accuracy is checked by conducting a calibration error (CE) test.

2.2.2.8 Calibration Error (CE). The difference between the concentration indicated by the CEMS and the known concentration of the cylinder gas. A CE test procedure is performed to document the accuracy and linearity of the monitoring equipment over the entire measurement range.

2.2.2.9 Performance Specification Test (PST) Period. The period during which CD, CE, and response time tests are conducted.

2.2.2.10 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.

2.2.3 Installation and Measurement Location Specifications

2.2.3.1 CEMS Installation and Measurement Locations. The CEMS shall be installed in a location in which measurements representative of the source's emissions can be obtained. The optimum location of the sample interface for the CEMS is determined by a number of factors, including ease of access for calibration and maintenance, the degree to which sample conditioning will be required, the degree to which it represents total emissions, and the degree to which it represents the combustion situation in the firebox. The location should be as free from in-leakage influences as possible and reasonably free from severe flow disturbances. The

sample location should be at least two equivalent duct diameters downstream from the nearest control device, point of pollutant generation, or other point at which a change in the pollutant concentration or emission rate occurs and at least 0.5 diameter upstream from the exhaust or control device. The equivalent duct diameter is calculated as per 40 CFR part 60, appendix A, method 1, section 2.1. If these criteria are not achievable or if the location is otherwise less than optimum, the possibility of stratification should be investigated as described in section 2.2.3.2. The measurement point shall be within the centroidal area of the stack or duct cross section.

2.2.3.2 Stratification Test Procedure. Stratification is defined as a difference in excess of 10 percent between the average concentration in the duct or stack and the concentration at any point more than 1.0 meter from the duct or stack wall. To determine whether effluent stratification exists, a dual probe system should be used to determine the average effluent concentration while measurements at each traverse point are being made. One probe, located at the stack or duct centroid, is used as a stationary reference point to indicate the change in effluent concentration over time. The second probe is used for sampling at the traverse points specified in 40 CFR part 60 appendix A, method 1. The monitoring system samples sequentially at the reference and traverse points throughout the testing period for five minutes at each point.

2.2.4 CEMS Performance and Equipment Specifications

If this method is applied in highly explosive areas, caution and care shall be exercised in choice of equipment and installation.

2.2.4.1 Flame Ionization Detector (FID) Analyzer. A heated FID analyzer capable of meeting or exceeding the requirements of these specifications. Heated systems shall maintain the temperature of the sample gas between 150 °C (300 °F) and 175 °C (350 °F) throughout the system. This requires all system components such as the probe, calibration valve, filter, sample lines, pump, and the FID to be kept heated at all times such that no moisture is condensed out of the system.

NOTE: As specified in the regulations, unheated HC CEMS may be considered an acceptable interim alternative monitoring technique. For additional notes, see section 2.2.10. The essential components of the measurement system are described below:

2.2.4.1.1 Sample Probe. Stainless steel, or equivalent, to collect a gas sample from the centroidal area of the stack cross-section.

2.2.4.1.2 Sample Line. Stainless steel or Teflon tubing to transport the sample to the analyzer.

NOTE: Mention of trade names or specific products does not constitute endorsement by the Environmental Protection Agency.

2.2.4.1.3 Calibration Valve Assembly. A heated three-way valve assembly to direct the zero and calibration gases to the analyzer is recommended. Other methods, such as quick-connect lines, to route calibration gas to the analyzers are applicable.

2.2.4.1.4 Particulate Filter. An in-stack or out-of-stack sintered stainless steel filter is recommended if exhaust gas particulate loading is significant. An out-of-stack filter must be heated.

2.2.4.1.5 Fuel. The fuel specified by the manufacturer (e.g., 40 percent hydrogen/60 percent helium, 40 percent hydrogen/60 percent nitrogen gas mixtures, or pure hydrogen) should be used.

2.2.4.1.6 Zero Gas. High purity air with less than 0.1 parts per million by volume (ppm) HC as methane or carbon equivalent or less than 0.1 percent of the span value, whichever is greater.

2.2.4.1.7 Calibration Gases. Appropriate concentrations of propane gas (in air or nitrogen). Preparation of the calibration gases should be done according to the procedures in EPA Protocol 1. In addition, the manufacturer of the cylinder gas should provide a recommended shelf life for each calibration gas cylinder over which the concentration does not change by more than ±3 percent from the certified value.

2.2.4.2 CEMS Span Value. 100 ppm propane.

2.2.4.3 Daily Calibration Gas Values. The owner or operator must choose calibration gas concentrations that include zero and high-level calibration values.

2.2.4.3.1 The zero level may be between 0 and 20 ppm (zero and 20 percent of the span value).

2.2.4.3.2 The high-level concentration shall be between 50 and 90 ppm (50 and 90 percent of the span value).

2.2.4.4 Data Recorder Scale. The strip chart recorder, computer, or digital recorder must be capable of recording all readings within the CEMS's measurement range and shall have a resolution of 0.5 ppm (0.5 percent of span value).

2.2.4.5 Response Time. The response time for the CEMS must not exceed 2 minutes to achieve 95 percent of the final value.

2.2.4.6 Calibration Drift. The CEMS must allow the determination of CD at the zero and high-level values. The CEMS calibration response must not differ by more than ±3 ppm (±3 percent of the span value) after each 24-hour period of the 7-day test at both zero and high levels.

2.2.4.7 Calibration Error. The mean difference between the CEMS and reference values at all three test points listed below shall be no greater than 5 ppm (±5 percent of the span value).

2.2.4.7.1 Zero Level. Zero to 20 ppm (0 to 20 percent of span value).

2.2.4.7.2 Mid-Level. 30 to 40 ppm (30 to 40 percent of span value).

2.2.4.7.3 High-Level. 70 to 80 ppm (70 to 80 percent of span value).

2.2.4.8 Measurement and Recording Frequency. The sample to be analyzed shall pass through the measurement section of the analyzer without interruption. The detector shall measure the sample concentration at least once every 15 seconds. An average emission rate shall be computed and recorded at least once every 60 seconds.

2.2.4.9 Hourly Rolling Average Calculation. The CEMS shall calculate every minute an hourly rolling average, which is the arithmetic mean of the 60 most recent 1-minute average values.

2.2.4.10 Retest. If the CEMS produces results within the specified criteria, the test is successful. If the CEMS does not meet one or more of the criteria, necessary corrections must be made and the performance tests repeated.

2.2.5 Performance Specification Test (PST) Periods

2.2.5.1 Pretest Preparation Period. Install the CEMS, prepare the PFM test site according to the specifications in section 2.2.3, and prepare the CEMS for operation and calibration according to the manufacturer's written instructions. A pretest conditioning period similar to that of the 7-day CD test is recommended to verify the operational status of the CEMS.

2.2.5.2 Calibration Drift Test Period. While the facility is operating under normal conditions, determine the magnitude of the CD at 24-hour intervals for seven consecutive days according to the procedure given in section 2.2.6.1. All CD determinations must be made following a 24-hour period during which no unscheduled maintenance, repair, or adjustment takes place. If the combustion unit is taken out of service during the test period, record the onset and duration of the downtime and continue the CD test when the unit resumes operation.

2.2.5.3 Calibration Error Test and Response Time Test Periods. Conduct the CE and response time tests during the CD test period.

2.2.6 Performance Specification Test Procedures

2.2.6.1 Calibration Drift Test.

2.2.6.1.1 Sampling Strategy. Conduct the CD test at 24-hour intervals for seven consecutive days using calibration gases at the two daily concentration levels specified in section 2.2.4.3. Introduce the two calibration gases into the sampling system as close to the sampling probe outlet as practical. The gas shall pass through all CEM components used during normal sampling. 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. Record the CEMS response and subtract this value from the reference (calibration gas) value. To meet the specification, none of the differences shall exceed 3 ppm.

2.2.6.1.2 Calculations. Summarize the results on a data sheet. An example is shown in Figure 2.2-1. Calculate the differences between the CEMS responses and the reference values.

2.2.6.2 Response Time. The entire system including sample extraction and transport, sample conditioning, gas analyses, and the data recording is checked with this procedure.

2.2.6.2.1 Introduce the calibration gases at the probe as near to the sample location as possible. Introduce the zero gas into the system. 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.

2.2.6.2.2 Next, introduce a high-level calibration gas and repeat the above procedure. Repeat the entire procedure three times and determine the mean upscale and downscale responses times. The longer of the two means is the system response time.

2.2.6.3 Calibration Error Test Procedure. 2.2.6.3.1 Sampling Strategy. Challenge the CEMS with zero gas and EPA Protocol 1 cylinder gases at measurement points within the ranges specified in section 2.2.4.7. 2.2.6.3.1.1 The daily calibration gases, if Protocol 1, may be used for this test.

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER	SPAN:

	DAY	DATE	TIME	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE	PERCENT OF SPAN*
ZERO/LOW LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						
HIGH LEVEL	1						
	2						
	3						
	4						
	5						
	6						
	7						

*Acceptance Criteria: $\pm 3\%$ of span each day for seven days.

Figure 2.2-1 Calibration Drift Determination

2.2.6.3.1.2 Operate the CEMS as nearly as possible in its normal sampling mode. The calibration gas should be injected into the sampling system as close to the sampling probe outlet as practical and shall pass through all filters, scrubbers, conditioners, and other monitor components used during normal sampling. Challenge the CEMS three non-consecutive times at each measurement point and record the responses. The duration of each gas injection should be for a sufficient period of time to ensure that the CEMS surfaces are conditioned.

2.2.6.3.2 Calculations. Summarize the results on a data sheet. An example data sheet is shown in Figure 2.2-2. Average the differences between the instrument response and the certified cylinder gas value for each gas. Calculate three CE results according to Equation 1. No confidence coefficient is used in CE calculations.

2.2.7 Equations

2.2.7.1 Calibration Error. Calculate CE using Equation 1.

$$CE = \left| \frac{\bar{d}}{FS} \right| \times 100 \quad (\text{Eq. 1})$$

where:

$\bar{d}$ = Mean difference between CEMS response and the known reference concentration.

2.2.8 Reporting

At a minimum, summarize in tabular form the results of the CE, response time, and CE test, as appropriate. Include all data sheets, calculations, CEMS data records, and cylinder gas or reference material certifications.

SOURCE:	DATE:
MONITOR:	LOCATION:
SERIAL NUMBER:	SPAN:

RUN NUMBER	CALIBRATION VALUE	MONITOR RESPONSE	DIFFERENCE		
			Zero/Low	Mid	High
1 - Zero					
2 - Mid					
3 - High					
4 - Mid					
5 - Zero					
6 - High					
7 - Zero					
8 - Mid					
9 - High					
MEAN DIFFERENCE =			%	%	%
CALIBRATION ERROR =			%	%	%

Figure 2.2-2 Calibration Error Determination

2.2.9 Quality Assurance (QA)

Proper calibration, maintenance, and operation of the CEMS is the responsibility of the owner or operator. The owner or operator must establish a QA program to evaluate and monitor CEMS performance. As a minimum, the QA program must include:

2.2.9.1 A daily calibration check for each monitor. The calibration must be adjusted if the check indicates the instrument's CD exceeds 3 ppm. The gases shall be injected as close to the probe as possible to provide a check of the entire sampling system. If an alternative calibration procedure is desired (e.g., direct injections or gas cells), subject to Administrator approval, the adequacy of this alternative procedure may be demonstrated during the initial 7-day CD test. Periodic comparisons of the two procedures are suggested.

2.2.9.2 A daily system audit. The audit must include a review of the calibration check data, an inspection of the recording system, an inspection of the control panel warning lights, and an inspection of the sample transport and interface system (e.g., flowmeters, filters), as appropriate.

2.2.9.3 A quarterly CE test. Quarterly RA tests may be substituted for the CE test when approved by the Director on a case-by-case basis.

2.2.9.4 An annual performance specification test.

2.2.10 Alternative Measurement Technique

The regulations allow gas conditioning systems to be used in conjunction with unheated HC CEMs during an interim period. This gas conditioning may include cooling to not less than 40 °F and the use of condensate traps to reduce the moisture content of sample gas entering the FID to less than 2 percent. The gas conditioning system, however, must not allow the sample gas to bubble through the condensate as this would remove water soluble organic compounds. All components upstream of the conditioning system should be heated as described in section 2.2.4 to minimize operating and maintenance problems.

2.2.11 References

1. Measurement of Volatile Organic Compounds-Guideline Series. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711, EPA-450/2-78-041, June 1978.
2. Traceability Protocol for Establishing True Concentrations of Gases Used for Calibration and Audits of Continuous Source Emission Monitors (Protocol No. 1). U.S. Environmental Protection Agency ORDEMSL, Research Triangle Park, North Carolina, 27711, June 1978.
3. Gasoline Vapor Emission Laboratory Evaluation-Part 2. U.S. Environmental Protection Agency, Research Triangle Park, North Carolina, 27711, EMB Report No. 76-GAS-6, August 1975.

section Agency, OAQPS, Research Triangle Park, North Carolina, 27711, EMB Report No. 76-GAS-6, August 1975.

SECTION 3.0 SAMPLING AND ANALYTICAL METHODS

3.1 Methodology for the Determination of Metals Emissions in Exhaust Gases from Hazardous Waste Incineration and Similar Combustion Processes

3.1.1 Applicability and Principle

3.1.1.1 Applicability. This method is being developed for the determination of total chromium (Cr), cadmium (Cd), arsenic (As), nickel (Ni), manganese (Mn), beryllium (Be), copper (Cu), zinc (Zn), lead (Pb), selenium (Se), phosphorus (P), thallium (Tl), silver (Ag), antimony (Sb), barium (Ba), and mercury (Hg) stack emissions from hazardous waste incinerators and similar combustion processes. This method may also be used for the determination of particulate emissions following the procedures and precautions described. Modifications to the sample recovery and analysis procedures described in this protocol for the purpose of determining particulate emissions may potentially impact the front-half mercury determination. Mercury emissions should be determined using EPA method 101A given in 40 CFR part 61.

3.1.1.2 Principle. The stack sample is withdrawn isokinetically from the source, with particulate emissions collected in the probe and on a heated filter and gaseous emissions collected in a series of chilled impingers containing an aqueous solution of dilute nitric acid combined with dilute hydrogen peroxide in each of two impingers, and acidic potassium permanganate solution in each of two impingers. Sampling train components are recovered and digested in separate front- and back-half fractions. Materials collected in the sampling train are digested with acid solutions to dissolve organics and to remove organic constituents that may create analytical interferences. Acid digestion is performed using conventional Parr® Bomb or microwave digestion techniques. The nitric acid and hydrogen peroxide impinger solution, the acidic potassium permanganate impinger solution, the HCl rinse solution, and the probe rinse and digested filter solutions are analyzed for mercury by cold vapor atomic absorption spectroscopy (CVAAS). The nitric acid and hydrogen peroxide solution and the probe rinse and digested filter solutions of the train catches are analyzed for Cr, Cd, Ni, Mn, Cu, Zn, Pb, Se, P, Tl, Ag, Sb, Ba, and As by inductively coupled argon plasma emission spectroscopy (ICAP) or atomic absorption spectroscopy (AAS). Graphite furnace atomic absorption spectroscopy (GFAAS) is used for analysis of antimony, arsenic, cadmium, lead, selenium, and thallium, if these

elements require greater analytical sensitivity than can be obtained by ICAP. Additionally, if desired, the tester may use AAS for analyses of all metals if the resulting in-stack method detection limits meet the goal of the testing program. For convenience, aliquots of each digested sample Fraction 1A plus Fraction 2A can be combined proportionally with respect to the original Fraction 1 (normally diluted to 300 ml following digestion and prior to analysis) section 3.1.5.3.3; and concentrated Fraction 2A (normally diluted to 150 ml following digestion and prior to analysis) section 3.1.5.3.4.1 or 3.1.5.3.4.2 for a single analytical determination. The efficiency of the analytical procedure is quantified by the analysis of spiked quality control samples containing each of the target metals and/or other quality assurance measures, as necessary, including actual sample matrix effects checks.

3.1.2 Range, Sensitivity, Precision, and Interferences

3.1.2.1 Range. For the analyses described in this methodology and for similar analyses, the ICAP response is linear over several orders of magnitude. Samples containing metal concentrations in the nanograms per milliliter (ng/ml) range in the analytical finish solution can be analyzed using this technique. Samples containing greater than approximately 50 µg/ml of chromium, lead, or arsenic should be diluted to that level or lower for final analysis. Samples containing greater than approximately 20 µg/ml of cadmium should be diluted to that level before analysis.

3.1.2.2 Analytical Sensitivity. ICAP analytical detection limits for the sample solutions (based on SW-846, method 6010) are approximately as follows: Sb (32 ng/ml), As (53 ng/ml), Ba (2 ng/ml), Be (0.3 ng/ml), Cd (4 ng/ml), Cr (7 ng/ml), Cu (6 ng/ml), Pb (42 ng/ml), Mn (2 ng/ml), Ni (15 ng/ml), P (75 ng/ml), Se (2 ng/ml), Ag (7 ng/ml), Tl (40 ng/ml), and Zn (2 ng/ml). The actual method detection limits are sample dependent and may vary as the sample matrix may affect the limits. The analytical detection limits for analysis by direct aspiration AAS (based on SW-846, Method 7000 series) are approximately as follows: Sb (200 ng/ml), As (2 ng/ml), Ba (100 ng/ml), Be (5 ng/ml), Cd (5 ng/ml), Cr (50 ng/ml), Cu (20 ng/ml), Pb (100 ng/ml), Mn (10 ng/ml), Ni (40 ng/ml), Se (2 ng/ml), Ag (10 ng/ml), Tl (100 ng/ml), and Zn (5 ng/ml). The detection limit for mercury by CVAAS is approximately 0.2 ng/ml. The use of GFAAS can give added sensitivity compared to the use of direct aspiration AAS for the following materials: Sb (3 ng/ml), As (1 ng/ml), Be (0.2 ng/ml), Cd (0.1 ng/ml), Cr (1 ng/ml), Pb (1 ng/ml), Se (2 ng/ml), and Tl (1 ng/ml).

Using (1) the procedures described in this method, (2) the analytical detection limits described in the previous paragraph, (3) a volume of 300 ml, Fraction 1, for the front-half and 150 ml, Fraction 2A, for the back-half samples, and (4) a stack gas sample volume of 1.25 m³, the corresponding in-stack method detection limits are presented in Table A-1 and calculated as shown:

$$\frac{A \times B}{C} = D$$

where:

A=analytical detection limit, µg/ml.

B=volume of sample prior to aliquot for analysis, ml.

C=stack sample volume, decm (dm³).

D=in-stack detection limit, µg/m³.

Values in Table 3.1-1 are calculated for the front and back half and/or the total train.

To ensure optimum sensitivity in obtaining the measurements, the concentrations of target metals in the solutions are suggested to be at least ten times the analytical detection limits. Under certain conditions, and with greater care in the analytical procedure, this concentration can be as low as approximately three times the analytical detection limit. In all cases, on at least one sample (run) in the source test and for each metal analyzed, repetitive analyses, method of standard additions (MSA), serial dilution, or matrix spike addition, etc., shall be used to establish the quality of the data.

Actual in-stack method detection limits will be determined based on actual source sampling parameters and analytical results as described above. If required, the method is sensitive than those shown in Table A-1 for a specific test by using one or more of the following options:

- A 1-hour sampling run may collect a stack gas sampling volume of about 1.25 m³. If the sampling time is increased and 5 m³ are collected, the in-stack method detection limits would be one fourth of the values shown in Table A-1 (this means that with this change, the method is four times more sensitive than a 1-hour run. Larger sample volumes (longer runs) would make it even more sensitive).

- The in-stack detection limits assume that all of the sample is digested (with exception of the aliquot for mercury) and the final liquid volumes for analysis are 300 ml, Fraction 1 for the front half and 150 ml, Fraction 2A, for the back-half sample. If the front-half volume is reduced from 300 ml to 50 ml, the front-half in-stack detection limits would be one tenth of the values shown above (ten times more sensitive). If the back-half volume is reduced from 150 ml to 25 ml, the in-stack detection limits would be

one sixth of the above values. Matrix effects checks are necessary on analyses of samples and typically are of greater significance for samples that have been concentrated to less than the normal original sample volume. Reduction to a volume of less than 25 ml may not allow redissolving of the residue and may increase interference by other compounds.

TABLE 3. 1-1—IN-STOCK METHOD DETECTION LIMITS (µg/m³) FOR TRAIN FRACTIONS USING ICAP AND AAS

Metal	Front-half fraction 1 probe and filter	Back-half fraction 1-3	Back-half fraction 4-6	Total train
Antimony	7.7 (0.7)*	3.8 (0.4)*	11.5 (1.1)*	19.1 (0.4)*
Arsenic	12.7 (0.3)*	6.4 (0.1)*	0.8	0.8
Barium	0.5	0.3	0.11 (0.08)*	0.11 (0.08)*
Beryllium	0.07 (0.03)*	0.04 (0.03)*	1.5 (0.03)*	2.5 (0.3)*
Cadmium	1.0 (0.02)*	0.5 (0.01)*	2.1	2.1
Chromium	1.7 (0.2)*	0.8 (0.1)*	15.1 (0.3)*	0.7 (0.3)*
Copper	1.4	0.7	5.8*	5.8*
Lead	10.1 (0.2)*	5.0 (0.1)*	2.0*	5.4
Manganese	0.5 (0.2)*	0.2 (0.1)*	27	27 (49)*
Mercury	0.6**	3.0**	1.8	2.8
Nickel	3.6	1.8	9	14.4 (0.3)*
Phosphorus	18	9	9 (0.03)*	0.8
Selenium	10 (6)*	9 (0.03)*	0.9	0.9
Silver	1.7	0.9	4.8 (0.1)*	0.3
Thallium	9.8 (0.2)*	0.3		
Zinc	0.5			

[*] Detection limit when analyzed by GFAAS.

[*] Detection limit when analyzed by GFAAS, estimated by CVAAAS.

NOTE: Actual method in-stock detection limits will be determined based on actual source sampling parameters and analytical results as described earlier in this section.

• Conversely, reducing stack gas sample volume and increasing sample liquid volume will increase in-stock detection limits (the method would then be less sensitive). The front-half and back-half samples (Fractions 1A plus and 2A) can be combined proportionally (see section 3.1.1.2 of this methodology) prior to analysis. The resultant liquid volume (excluding the mercury fractions, which must be analyzed separately) is recorded. Combining the sample as described does not allow determination (whether front or back half) of where in the train the sample was captured. The in-stock method detection limit then becomes a single value for all metals except mercury, for which the contribution of the mercury fractions must be considered.

• The above discussion assumes no blank correction. Blank corrections are discussed later in this method.

3.1.2.3 Precision. The precisions (relative standard deviation) for each metal detected in a method development test at a sewage sludge incinerator, are as follows: Sb (12.7%), As (13.5%), Ba (20.6%), Cd (11.5%), Cr (11.2%), Cu (11.5%), Pb (11.6%), P (14.6%), Se (16.3%), Ti (12.3%), and Zn (11.8%). The precision for

similar to the 40 CFR part 60, appendix A method 5 train. The sampling train consists of the following components:

3.1.3.1.1 Probe Nozzle (Probe Tip) and Borosilicate or Quartz Glass Probe Liner. Same as method 5, sections 2.1.1 and 2.1.2, except that glass nozzles are required unless an alternate probe tip prevents the possibility of contamination or interference of the sample with its materials of construction. If a probe tip other than glass is used, no correction (because of any effect on the sample by the probe tip) of the stack sample test results can be made.

3.1.3.1.2 Pilot Tube and Differential Pressure Gauge. Same as method 2, sections 2.1 and 2.2, respectively.

3.1.3.1.3 Filter Holder. Glass, same as method 5, section 2.1.5, except that a Teflon filter support or other non-metallic, non-contaminating support must be used to replace the glass frit.

3.1.3.1.4 Filter Heating System. Same as method 5, section 2.1.6.

3.1.3.1.5 Condenser. The following system shall be used for the condensation and collection of gaseous metals and for determining the moisture content of the stack gas. The condensing system should consist of four to seven impingers connected in series with leak-free ground glass fittings or other leak-free, non-contaminating fittings. The first impinger is optional and is recommended as a moisture knockout trap for use during test

conditions which require such a trap. The first impinger shall be appropriately sized, if necessary, for an expected large moisture catch and generally constructed as described for the first impinger in method 5, paragraph 2.1.7. The second impinger (or the first HNO₃/H₂O₂ impinger) shall also be constructed as described for the first impinger in method 5. The third impinger for the second HNO₃/H₂O₂ impinger shall be the same as the Greenburg Smith impinger with the standard tip described as the second impinger in method 5, paragraph 2.1.7. All other impingers used in the methods train are the same as the first HNO₃/H₂O₂ impinger described in this paragraph. In summary, the first impinger which may be optional as described in this methodology shall be empty. The second and third shall contain known quantities of a nitric acid/hydrogen peroxide solution (section 3.1.4.2.1), the fourth shall be empty, the fifth and sixth shall contain a known quantity of acidic potassium permanganate solution (section 3.1.4.2.2), and the last impinger shall contain a known quantity of silica gel. A thermometer capable of measuring to within 1°C (2°F) shall be placed at the outlet of the last impinger. When the moisture knockout impinger is not needed, it is removed from the train and the other impingers remain the same. If mercury analysis is not to be performed, the potassium permanganate impingers and the empty impinger preceding them are removed.

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3.1.3.1.6 Metering System, Barometer, and Gas Density Determination Equipment. Same as method 5, sections 2.1.8 through 2.1.10, respectively.

3.1.3.1.7 Teflon Tape. For capping openings and sealing connections, if necessary, on the sampling train.

3.1.3.2 Sample Recovery. Same as method 5, sections 2.2.1 through 2.2.8 (Nonmetallic Probe-Liner and Probe-Nozzle Brushes or Swabs, Wash Bottles, Sample Storage Containers, Petri Dishes, Glass Graduated Cylinders, Plastic Storage Containers, Funnel and Rubber Policeman, and Glass Funnel), respectively, with the following exceptions and additions:

3.1.3.2.1 Nonmetallic Probe-Liner and Probe-Nozzle Brushes or Swabs. For quantitative recovery of materials collected in the front half of the sampling train: Description of acceptable all-Teflon component brushes or swabs is to be included in EPA's Emission Measurement Technical Information Center (EMTIC) files.

3.1.3.2.2 Sample Storage Containers. Glass bottles with Teflon-lined caps which are non-reactive to the oxidizing solutions, with a capacity of 1000- and 500-ml, shall be used for KMnO_4 -containing samples and blanks. Polyethylene bottles may be used for other sample types.

3.1.3.2.3 Graduated Cylinder. Glass or equivalent.

3.1.3.2.4 Funnel. Glass or equivalent.

3.1.3.2.5 Labels. For identification of samples.

3.1.3.2.6 Polypropylene Tweezers and/or Plastic Gloves. For recovery of the filter from the sampling train filter holder.

3.1.3.3 Sample Preparation and Analysis. For the analysis, the following equipment is needed:

3.1.3.3.1 Volumetric Flasks, 100-ml, 250-ml, and 1000-ml. For preparation of standards and sample dilution.

3.1.3.3.2 Graduated Cylinders. For preparation of reagents.

3.1.3.3.3 Parr® Bombs or Microwave Pressure Relief Vessels with Capping Station (GEM Corporation model or equivalent).

3.1.3.3.4 Beakers and Watchglasses. 250-ml beakers for sample digestion with watchglasses to cover the tops.

3.1.3.3.5 Ring Stands and Clamps. For securing equipment such as filtration apparatus.

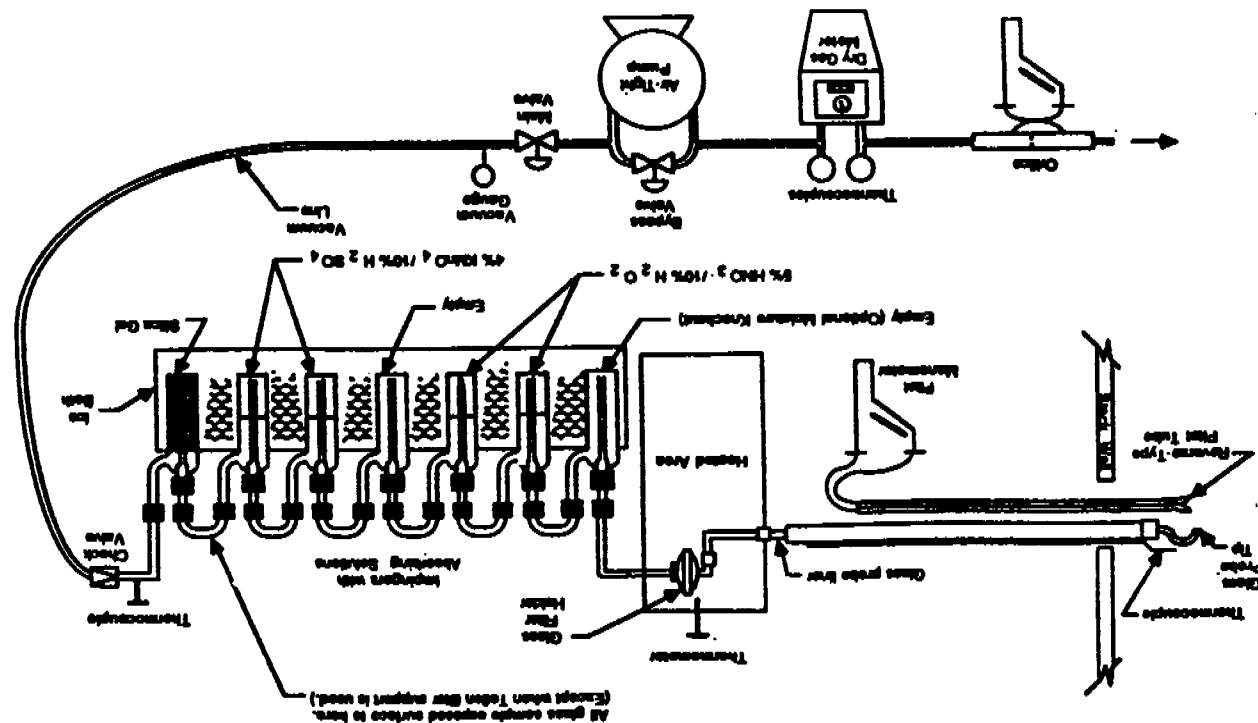
3.1.3.3.6 Filter Funnels. For holding filter paper.

3.1.3.3.7 Whatman 541 Filter Paper (or equivalent). For filtration of digested samples.

3.1.3.3.8 Disposable Pasteur Pipets and Bulbs.

3.1.3.3.9 Volumetric Pipets.

3.1.3.3.10 Analytical Balance. Accurate to within 0.1 mg.



or SO_4 , as described in EPA method 5. Quartz filter filters meeting these requirements are recommended for use in this method.

3.1.4.1.2 Water. To conform to ASTM Specification D1193-77, Type II (incorporated by reference). If necessary, analyze the water for all target metals prior to field use. All target metal concentrations should be less than 1 $\mu\text{g}/\text{ml}$.

3.1.4.1.3 Nitric Acid. Concentrated. Baker Instr.-analyzed or equivalent.

3.1.4.1.4 Hydrochloric Acid. Concentrated. Baker Instr.-analyzed or equivalent.

3.1.4.1.5 Hydrogen Peroxide, 30 Percent (V/V).

3.1.4.1.6 Potassium Permanganate.

3.1.4.1.7 Sulfuric Acid. Concentrated.

3.1.4.1.8 Silica Gel and Crushed Ice. Same as method 5, sections 3.1.2 and 3.1.4, respectively.

3.1.4.2 Pretest Preparation for Sampling Reagents.

3.1.4.2.1 Nitric Acid (HNO_3)/Hydrogen Peroxide (H_2O_2) Absorbing Solution, 5 Percent $\text{HNO}_3/10$ Percent H_2O_2 . Carefully with stirring, add 50 ml of concentrated HNO_3 to a 100-ml volumetric flask containing approximately 500 ml of water, and then, carefully with stirring, add 33 ml of 30 percent H_2O_2 . Dilute to volume (1000 ml) with water. Mix well. The reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of each target metal.

3.1.4.2.2 Acidic Potassium Permanganate (KMnO_4) Absorbing Solution, 4 Percent KMnO_4 (W/V), 10 Percent H_2SO_4 (V/V). Prepare fresh daily. Mix carefully, with stirring, 100 ml of concentrated H_2SO_4 into 800 ml of water, and add water with stirring to make a volume of 1 L. This solution is 10 percent H_2SO_4 (V/V). Dissolve, with stirring, 40 g of KMnO_4 into 10 percent H_2SO_4 (V/V) and add a volume of 1 L; this is the acidic potassium permanganate absorbing solution. Prepare and store in glass bottles to prevent degradation. The reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of Hg.

Precaution: To prevent autocatalytic decomposition of the permanganate solution, filter the solution through Whatman 641 filter paper. Also, due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottle; these bottles shall not be fully filled and shall be vented both to relieve potential excess pressure and prevent explosion due to pressure buildup. Venting is required, but should not allow contamination of the sample; a No. 70-72 hole drilled in the container cap and Teflon liner has been used.

3.1.4.2.3 Nitric Acid, 0.1 N. With stirring, add 6.3 ml of concentrated HNO_3 (70 percent) to a flask containing approximately 900 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of each target metal.

3.1.4.2.4 Hydrochloric Acid (HCl), 8 N. Make the desired volume of 8 N HCl in the following proportions. Carefully with stirring, add 690 ml of concentrated HCl to a flask containing 250 ml of water. Dilute to 1000 ml with water. Mix well. The reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of Hg.

3.1.4.3 Glassware Cleaning Reagents.

3.1.4.3.1 Nitric Acid, Concentrated. Fisher ACS grade or equivalent.

3.1.4.3.2 Water. To conform to ASTM Specifications D1193-77, Type II.

3.1.4.3.3 Nitric Acid, 10 Percent (V/V). With stirring, add 500 ml of concentrated HNO_3 to a flask containing approximately 4000 ml of water. Dilute to 5000 ml with water. Mix well. Reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of each target metal.

3.1.4.4 Sample Digestion and Analysis Reagents.

3.1.4.4.1 Hydrochloric Acid, Concentrated.

3.1.4.4.2 Hydrofluoric Acid, Concentrated.

3.1.4.4.3 Nitric Acid, Concentrated. Baker Instr.-analyzed or equivalent.

3.1.4.4.4 Nitric Acid, 50 Percent (V/V). With stirring, add 125 ml of concentrated HNO_3 to 100 ml of water. Dilute to 250 ml with water. Mix well. Reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of each target metal.

3.1.4.4.5 Nitric Acid, 5 Percent (V/V). With stirring, add 50 ml of concentrated HNO_3 to 800 ml of water. Dilute to 1000 ml with water. Mix well. Reagent shall contain less than 2 $\mu\text{g}/\text{ml}$ of each target metal.

3.1.4.4.6 Water. To conform to ASTM Specifications D1193-77, Type II.

3.1.4.4.7 Hydroxylamine Hydrochloride and Sodium Chloride Solution. See EPA method 7470 for preparation.

3.1.4.4.8 Stannous Chloride. See method 7470.

3.1.4.4.9 Potassium Permanganate, 5 Percent (W/V). See method 7470.

3.1.4.4.10 Sulfuric Acid, Concentrated.

3.1.4.4.11 Nitric Acid, 50 Percent (V/V).

3.1.4.4.12 Potassium Persulfate, 5 Percent (W/V). See method 7470.

3.1.4.4.13 Nickel Nitrate, $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$.

3.1.4.4.14 Lanthanum Oxide, La_2O_3 .

3.1.4.4.15 AAS Grade Hg Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.16 AAS Grade Pb Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.17 AAS Grade As Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.18 AAS Grade Cd Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.19 AAS Grade Cr Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.20 AAS Grade Sb Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.21 AAS Grade Ba Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.22 AAS Grade Be Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.23 AAS Grade Cu Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.24 AAS Grade Mn Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.25 AAS Grade Ni Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.26 AAS Grade P Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.27 AAS Grade Se Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.28 AAS Grade Ag Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.29 AAS Grade Tl Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.30 AAS Grade Zn Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.31 AAS Grade Al Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.32 AAS Grade Fe Standard, 1000 $\mu\text{g}/\text{ml}$.

3.1.4.4.33 The metals standards may also be made from solid chemicals as described in EPA Method 200.7, EPA SW-846 Method 7470 or Standard Methods for the Analysis of Water and Wastewater, 15th Edition. Method 303F should be referred to for additional information on mercury standards.

3.1.4.4.34 Mercury Standards and Quality Control Samples. Prepare fresh weekly a 10 $\mu\text{g}/\text{ml}$ intermediate mercury standard by adding 5 ml of 1000 $\mu\text{g}/\text{ml}$ mercury stock solution to a 500-ml volumetric flask; dilute with stirring to 500 ml by first carefully adding 20 ml of 15 percent HNO_3 , and then adding water to the 500-ml volume. Mix well. Prepare a 200 $\mu\text{g}/\text{ml}$ working mercury standard solution fresh daily: Add 5 ml of the 10 $\mu\text{g}/\text{ml}$ intermediate standard to a 250-ml volumetric flask and dilute to 250 ml with 5 ml of 4 percent KMnO_4 , 5 ml of 15 percent HNO_3 , and then water. Mix well. At least six separate aliquots of the working mercury standard solution should be used to prepare the standard curve. These aliquots should contain 0.0, 1.0, 2.0, 3.0, 4.0, and 5.0 ml of the working standard solution containing 0, 200, 400, 600, 800, and 1000 ng mercury, respectively. Quality control samples should be prepared by making a separate 10 $\mu\text{g}/\text{ml}$ standard and diluting until in the range of the calibration.

3.1.4.4.35 ICAP Standards and Quality Control Samples. Calibration standards for ICAP analysis can be combined into four different mixed standard solutions as shown below.

MIXED STANDARD SOLUTIONS FOR ICAP ANALYSIS

Solution	Elements
I	As, Ba, Cd, Mn, Pb, Se, Zn.
II	Ba, Cu, Fe.
III	Al, Cr, Ni.
IV	Ag, P, Sb, Ti.

Prepare these standards by combining and diluting the appropriate volumes of the 1000 $\mu\text{g}/\text{ml}$ solutions with 5 percent nitric acid. A minimum of one standard and a blank can be

used to form each calibration curve. However, a separate quality control sample spiked with known amounts of the target metals in quantities in the midrange of the calibration curve should be prepared. Suggested standard levels are 25 $\mu\text{g}/\text{ml}$ for Al, Cr, and Pb, 15 $\mu\text{g}/\text{ml}$ for Fe, and 10 $\mu\text{g}/\text{ml}$ for the remaining elements. Standards containing less than 1 $\mu\text{g}/\text{ml}$ of metal should be prepared daily. Standards containing greater than 1 $\mu\text{g}/\text{ml}$ of metal should be stable for a minimum of 1 to 2 weeks.

3.1.4.4.36 Graphite Furnace AAS Standards. Antimony, arsenic, cadmium, lead, selenium, and thallium. Prepare a 10 $\mu\text{g}/\text{ml}$ standard by adding 1 ml of 1000 $\mu\text{g}/\text{ml}$ standard to a 100-ml volumetric flask. Dilute with stirring to 100 ml with 10 percent nitric acid. For graphite furnace AAS, the standards must be matrix matched. Prepare a 100 $\mu\text{g}/\text{ml}$ standard by adding 1 ml of the 10 $\mu\text{g}/\text{ml}$ standard to a 10-ml volumetric flask and dilute to 100 ml with the appropriate matrix solution. Other standards should be prepared by dilution of the 100 $\mu\text{g}/\text{ml}$ standards. At least five standards should be used to make the standard curve. Suggested levels are 0, 10, 50, 75, and 100 $\mu\text{g}/\text{ml}$. Quality control samples should be prepared by making a separate 10 $\mu\text{g}/\text{ml}$ standard and diluting until it is in the range of the samples. Standards containing less than 1 $\mu\text{g}/\text{ml}$ of metal should be prepared daily. Standards containing greater than 1 $\mu\text{g}/\text{ml}$ of metal should be stable for a minimum of 1 to 2 weeks.

3.1.4.4.37 Matrix Modifiers.

3.1.4.4.37.1 Nickel Nitrate, 1 Percent (V/V). Dissolve 4.956 g of $\text{Ni}(\text{NO}_3)_2 \cdot 6\text{H}_2\text{O}$ in approximately 50 ml of water in a 100-ml volumetric flask. Dilute to 100 ml with water.

3.1.4.4.37.2 Nickel Nitrate, 0.1 Percent (V/V). Dilute 10 ml of the 1 percent nickel nitrate solution from section 4.4.37.1 above to 100 ml with water. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for As.

3.1.4.4.37.3 Lanthanum. Carefully dissolve 0.5864 g of La_2O_3 in 10 ml of concentrated HNO_3 , and dilute the solution by adding it with stirring to approximately 50 ml of water, and then dilute to 100 ml with water. Mix well. Inject an equal amount of sample and this modifier into the graphite furnace during AAS analysis for Pb.

3.1.5 Procedure

3.1.5.1 Sampling. The complexity of this method is such that, to obtain reliable results, testers and analysts should be trained and experienced with the test procedures, including source sampling, reagent preparation and handling, sample handling, analytical calculations, reporting, and descriptions specifically at the beginning of and throughout section 3.1.4 and all other sections of this methodology.

3.1.5.1.1 Pretest Preparation. Follow the same general procedure given in method 5, section 4.1.1, except that, unless particulate emissions are to be determined, the filter need not be desiccated or weighed. All sampling train glassware should first be rinsed with hot tap water and then washed in hot soapy water. Next, glassware should be rinsed three times with tap water, followed by three additional rinses with water. All glassware should then be soaked in a 10 percent (V/V) nitric acid solution for a minimum of 4 hours, rinsed three times with water, rinsed a final time with acetone, and allowed to air dry. All glassware openings where contamination can occur should be covered until the sampling train is assembled for sampling.

3.1.5.1.2 Preliminary Determinations. Same as method 5, section 4.1.2.

3.1.5.1.3 Preparation of Sampling Train. Follow the same general procedures given in method 5, section 4.1.3, except place 100 ml of the nitric acid/hydrogen peroxide solution (section 3.1.4.2.1) in each of the two HNO₃/H₂O₂ impingers as shown in Figure 3.1-1 (normally the second and third impingers), place 100 ml of the acidic potassium permanganate absorbing solution (section 3.1.4.2.2) in each of the two permanganate impingers as shown in Figure A-1, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the last impinger. Alternatively, the silica gel may be weighed directly in the impinger just prior to train assembly.

Several options are available to the tester based on the sampling requirements and conditions. The use of an empty first impinger can be eliminated if the moisture to be collected in the impingers will be less than approximately 100 ml. If necessary, use as applicable to this methodology the procedure described in section 7.1.1 of EPA method 101A, 40 CFR part 61, appendix B, to maintain the desired color in the last permanganate impinger.

Retain for reagent blanks volumes of the nitric acid/hydrogen peroxide solution per section 3.1.5.2.9 of this method and of the acidic potassium permanganate solution per section 3.1.5.2.10. These reagent blanks should be labeled and analyzed as described in section 3.1.7. Set up the sampling train as shown in Figure 3.1-1, or if mercury analysis is not to be performed in the train, then it should be modified by removing the two permanganate impingers and the impinger preceding the permanganate impingers. If necessary to ensure leak-free sampling train connections and prevent contaminating Teflon tape or other non-contaminating material should be used instead of silicone grease.

PRECAUTION: Extreme care should be taken to prevent contamination within the train. Prevent the mercury collection reagent (acidic potassium permanganate) from con-

tacting any glassware of the train which is washed and analyzed for Mn. Prevent hydrogen peroxide from mixing with the acidic potassium permanganate.

Mercury emissions can be measured, alternatively, in a separate train which measures only mercury emissions by using EPA method 101A with the modifications described below (and with the further modification that the permanganate containers shall be processed as described in the precaution in section 3.1.4.2.2 and the note in section 3.1.5.2.5 of this methodology). This alternative method is applicable for measurement of mercury emissions, and it may be of special interest to sources which must measure both mercury and manganese emissions.

Section 7.2.1 of method 101A shall be modified as follows after the 250 to 400-ml KMnO₄ rinse:

To remove any precipitated material and any residual brown deposits on the glassware following the permanganate rinse, rinse with approximately 100 ml of deionized distilled water, and add this water rinse carefully assuring transfer of all loose precipitated materials from the three permanganate impingers into the permanganate Container No. 1. If no viable deposits remain after this water rinse, do not rinse with 8 N HCl. However, if deposits do remain on the glassware after this water rinse, wash the impinger surfaces with 25 ml of 8 N HCl, and place the wash in a separate sample container labeled Container No. 1.A., containing 200 ml of water as follows. Place 200 ml of water in a sample container labeled Container No. 1.A. Wash the impinger walls and stem with the HCl by turning the impinger on its side and rotating it so that the HCl contacts all inside surfaces. Use a total of only 25 ml of 8 N HCl for rinsing all permanganate impingers combined. Rinse the first impinger, then pour the actual rinse used for the first impinger into the second impinger for its rinse, etc. Finally, pour the 25 ml of 8 N HCl rinse carefully with stirring into Container No. 1.A. Analyze the HCl rinse separately by carefully diluting with stirring the contents of Container No. 1.A. to 500 ml with deionized distilled water. Filter (if necessary) through Whatman 40 filter paper, and then analyze for mercury according to section 7.4, except limit the aliquot size to a maximum of 10 ml. Prepare and analyze a water diluted blank 8 N HCl sample by using the same procedure as that used by Container No. 1.A., except add 5 ml of 8 N HCl with stirring to 40 ml of water, and then dilute to 100 ml with water. Then analyze as instructed for the sample from Container No. 1.A. Because the previous separate permanganate solution rinse (section 7.2.1) and water rinse (as modified in these guidelines) have the capability to recover a very high percentage of the mercury from the permanganate impingers, the amount of mercury in the HCl rinse in Container No.

1.A. may be very small, possibly even insignificantly small. However, add the total of any mercury analyzed and calculated for the HCl rinse sample Container No. 1.A. to that calculated from the mercury sample from section 7.3.2 which contains the separate permanganate rinse (and water rinse as modified herein) for calculation of the total sample mercury concentration.

3.1.5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in method 5, section 4.1.4.1 (Pretest Leak-Check), section 4.1.4.2 (Leak-Checks During the Sample Run), and section 4.1.4.3 (Post-Test Leak-Checks).

3.1.5.1.5 Sampling Train Operation. Follow the procedures given in method 5, section 4.1.5. For each run, record the data required on a data sheet such as the one shown in Figure 5-2 of method 5.

3.1.5.1.6 Calculation of Percent Isokinetic. Same as method 5, section 4.1.6.

3.1.5.2 Sample Recovery. Begin cleanup procedures as soon as the probe is removed from the stack at the end of a sampling period.

The probe should be allowed to cool prior to sample recovery. When it can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a rinsed, non-contaminating cap over the probe nozzle to prevent losing or gaining particulate matter. Do not cap the probe tip tightly while the sampling train is cooling. This normally causes a vacuum to form in the filter holder, thus causing the undesired result of drawing liquid from the impingers into the filter.

Before moving the sampling train to the cleanup site, remove the probe from the sampling train and cap the open outlet. Be careful not to lose any condensate that might be

present. Cap the filter inlet where the probe was fastened. Remove the umbilical cord from the last impinger and cap the impinger. Cap off the filter holder outlet and impinger inlet. Use noncontaminating caps, whether ground-glass stoppers, plastic caps, serum caps, or Teflon tape to close these openings.

Alternatively, the train can be disassembled before the probe and filter holder/oven are completely cooled. If this procedure is followed: Initially disconnect the filter holder outlet/impinger inlet and loosely cap the open ends. Then disconnect the probe from the filter holder or cyclone inlet and loosely cap the open ends. Cap the probe tip and remove the umbilical cord as previously described.

Transfer the probe and filter-impinger assembly to a cleanup area that is clean and protected from the wind and other potential causes of contamination or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions. The sample is recovered and treated as follows (see schematic in Figure 3.1-2). Ensure that all items necessary for recovery of the sample do not contaminate it.

3.1.5.2.1 Container No. 1 (Filter). Carefully remove the filter from the filter holder and place it in its identified petri dish container. Acid-washed polypropylene or Teflon coated tweezers or clean, disposable surgical gloves rinsed with water and dried should be used to handle the filters. If it is necessary to fold the filter, make certain the particulate cake is inside the fold. Carefully transfer the filter and any particulate matter or filter fibers that adhere to the filter holder gasket to the petri dish by using a dry (acid-cleaned) nylon bristle brush. Do not use any metal-containing materials when recovering this train. Seal the labeled petri dish.

3.1.5.2.2 Container No. 2 (Acetone Rinse).
NOTE: Perform section 3.1.5.2.2 only if determination of particulate emissions are desired in addition to metals emissions. If only metals emissions are desired, skip section 3.1.5.2.2 and go to section 3.1.5.2.3. Taking care to see that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter and any condensate from the probe nozzle, probe fitting (plastic such as Teflon, polypropylene, etc. fittings are recommended to prevent contamination by metal fittings; further, if desired, a single glass piece consisting of a combined probe tip and probe liner may be used, but such a single glass piece is not a requirement of this methodology), probe liner, and front half of the filter holder by washing these components with 100 ml of acetone and placing the wash in a glass container.

NOTE: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Distilled water may be used instead of acetone when approved by the Administrator and shall be used when specified by the Administrator; in these cases, save a water blank and follow the Administrator's directions on analysis. Perform the acetone rinses as follows: Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nonmetallic brush. Brush until the acetone rinse shows no visible particles, after which make a final rinse of the inside surface with acetone.

Brush and rinse the sample-exposed, inside parts of the fitting with acetone in a similar way until no visible particles remain.

Rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with acetone. Allow the acetone to drain from the lower end into the sample container. A funnel may be used to aid in transferring liquid washings to the container. Follow the acetone rinse with a nonmetallic probe brush. Hold the probe in an inclined position, squirt acetone into the upper end as the probe brush is being pushed with a twisting action through the probe; hold a sample container underneath the lower end of the probe, and catch any acetone and particulate matter which is brushed through the probe three times or more until none remains in the probe liner on visual inspection. Rinse the brush with acetone, and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above.

It is recommended that two people clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contamination.

Clean the inside of the front half of the filter holder by rubbing the surfaces with a

nonmetallic nylon bristle brush and rinsing with acetone. Rinse each surface three times or more if needed to remove visible particulate. Make a final rinse of the brush and filter holder. After all acetone washings and particulate matter have been collected in the sample container tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether or not leakage occurred during transport. Label the container clearly to identify its contents.

3.1.5.2.3 Container No. 3 (Probe Rinse).
Keep the probe assembly clean and free from contamination as described in section 3.1.5.2.2 of this method during the 0.1 N nitric acid rinse described below. Rinse the probe nozzle and fitting probe liner, and front half of the filter holder thoroughly with 100 ml of 0.1 N nitric acid and place the wash into a sample storage container.

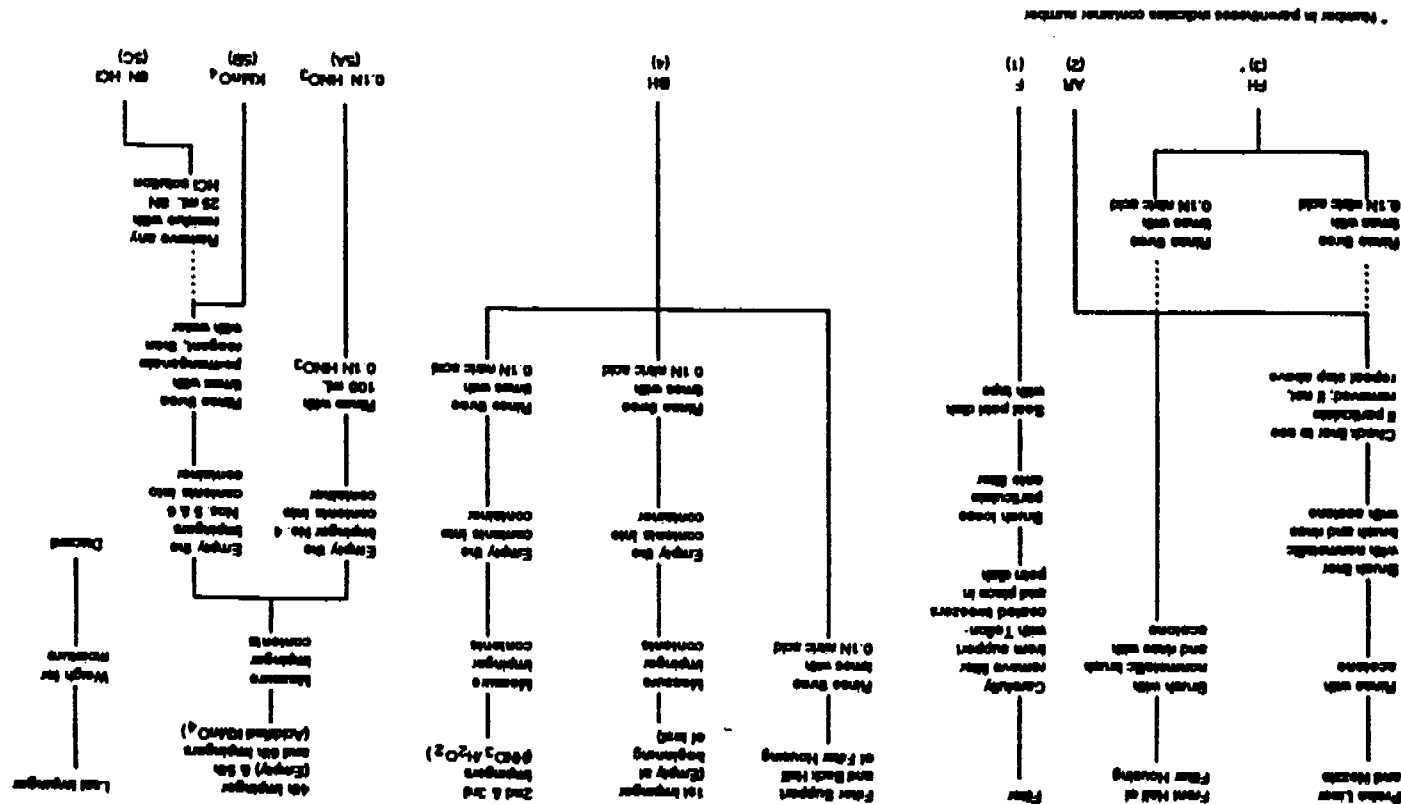
NOTE: The use of exactly 100 ml is necessary for the subsequent blank correction procedures. Perform the rinses as applicable and generally as described in method 12, section 5.2.2. Record the volume of the combined rinse. Mark the height of the fluid level on the outside of the storage container and use this mark to determine if leakage occurs during transport. Seal the container and clearly label the contents. Finally, rinse the nozzle, probe liner, and front half of the filter holder with water followed by acetone and discard these rinses.

3.1.5.2.4 Container No. 4 (Impingers 1 through 3, HNO₃/H₂O, Impingers and Moisture Knockout Impinger, when used, Containers and Rinses). Due to the potentially large quantity of liquid involved, the water may place the impinger solutions from impingers 1 through 3 in more than one container. Measure the liquid in the first three impingers volumetrically to within 0.5 ml using a graduated cylinder. Record the volume of liquid present. This information is required to calculate the moisture content of the sampled flue gas. Clean each of the first three impingers, the filter support, the back half of the filter housing, and connecting glassware by thoroughly rinsing with 100 ml of 0.1 N nitric acid using the procedure as applicable and generally as described in method 12, section 5.2.4.

NOTE: The use of exactly 100 ml of 0.1 N nitric acid rinse is necessary for the subsequent blank correction procedures. Combine the rinses and impinger solutions, measure and record the volume. Mark the height of the fluid level on the outside of the container to determine if leakage occurs during transport. Seal the container and clearly label the contents.

3.1.5.2.5 Container Nos. 5A, 5B, and 5C. 5A (0.1 N HNO₃), 5B (KMnO₄/H₂SO₄ absorbing solution), and 5C (8 N HCl rinse and dilution). (As described previously at the end of section.

Figure 3.1-2 Sample recovery scheme.



3.1.3.1.5 of this method, if mercury is not being measured in this train, then impingers 4, 5, and 6, as shown in Figure 3.1-2, are not necessary and may be eliminated.) Pour all the liquid, if any, from the impinger which was empty at the start of the run and which immediately precedes the two permanganate impingers (normally impinger No. 4) into a graduated cylinder and measure the volume to within 0.5 ml. This information is required to calculate the moisture content of the sampled flue gas. Place the liquid in Sample Container No. 5A. Rinse the impinger (No. 4) with 100 ml of 0.1 N HNO₃ and place this into Container No. 5A.

Pour all the liquid from the two permanganate impingers into a graduated cylinder and measure the volume to within 0.5 ml. This information is required to calculate the moisture content of the sampled flue gas. Place this KMnO₄ absorbing solution stock sample from the two permanganate impingers into Container No. 5B. Using 100 ml total of fresh acidified potassium permanganate solution, rinse the two permanganate impingers and connecting glass pieces a minimum of three times and place the rinses into Container No. 5B, carefully ensuring transfer of all loose precipitated materials from the two impingers into Container No. 5B. Using 100 ml total of water, rinse the permanganate impingers and connecting glass pieces a minimum of three times, and place the rinses into Container No. 5B, carefully ensuring transfer of all loose precipitated material, if any, from the two impingers into Container No. 5B. Mark the height of the fluid level on the outside of the bottle to determine if leakage occurs during transport. See the following note and the precaution in paragraph 3.1.4.2.2 and properly prepare the bottle and clearly label the contents.

NOTE: Due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottles. These bottles shall not be completely filled and shall be vented to relieve potential excess pressure. Venting is required. A No. 70-72 hole drilled in the container cap and Teflon liner has been used.

If no visible deposits remain after the above described water rinse, do not rinse with 8 N HCl. However, if deposits do remain on the glassware after this water rinse, wash the impinger surfaces with 25 ml of 8 N HCl, and place the wash in a separate sample container labeled Container No. 5C containing 200 ml of water as follows: Place 200 ml of water in a sample container labeled Container No. 5C. Wash the impinger walls and stem with the HCl by turning the impinger on its side and rotating it so that the HCl contacts all inside surfaces. Use a total of only 25 ml of 8 N HCl for rinsing both permanganate impingers combined. Rinse the first impinger, then pour the actual rinse

used for the first impinger into the second impinger for its rinse. Finally, pour the 25 ml of 8 N HCl rinse carefully with stirring into Container No. 5C. Mark the height of the fluid level on the outside of the bottle to determine if leakage occurs during transport.

3.1.5.2.6 Container No. 6 (Silica Gel). Note the color of the indicating silica gel to determine whether it has been completely spent and make a notation of its condition. Transfer the silica gel from its impinger to its original container and seal. The tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger.

The small amount of particles that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel since weight gained in the silica gel impinger is used for moisture calculations. Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g.

3.1.5.2.7 Container No. 7 (Acetone Blank). If particulate emissions are to be determined, at least once during each field test, place a 100-ml portion of the acetone used in the sample recovery process into a labeled container for use in the front-half field reagent blank. Seal the container.

3.1.5.2.8 Container No. 8A (0.1 N Nitric Acid Blank). At least once during each field test, place 300 ml of the 0.1 N nitric acid solution used in the sample recovery process into a labeled container for use in the front-half and back-half field reagent blanks. Seal the container. Container No. 8B (water blank). At least once during each field test, place 100 ml of the water used in the sample recovery process into a labeled Container No. 8B. Seal the container.

3.1.5.2.9 Container No. 9 (5% Nitric Acid/10% Hydrogen Peroxide Blank). At least once during each field test, place 200 ml of the 5% nitric acid/10% hydrogen peroxide solution used as the nitric acid impinger reagent into a labeled container for use in the back-half field reagent blank. Seal the container.

3.1.5.2.10 Container No. 10 (Acidified Potassium Permanganate Blank). At least once during each field test, place 100 ml of the acidified potassium permanganate solution used as the impinger solution and in the sample recovery process into a labeled container for use in the back-half field reagent blank for mercury analysis. Prepare the container as described in section 3.1.5.2.5.

NOTE: Due to the potential reaction of the potassium permanganate with the acid, there may be pressure buildup in the sample storage bottles. These bottles shall not be completely filled and shall be vented to relieve potential excess pressure. Venting is required. A No. 70-72 hole drilled in the container cap and Teflon liner has been used.

3.1.5.2.11 Container No. 11 (8 N HCl Blank). At least once during each field test, perform both of the following: Place 200 ml of water into a sample container. Pour 25 ml of 8N HCl carefully with stirring into the 200 ml of water in the container. Mix well and seal the container.

3.1.5.2.12 Container No. 12 (Filter Blank). Once during each field test, place three unused blank filters from the same lot as the sampling filters in a labeled petri dish. Seal the petri dish. These will be used in the front-half field reagent blank.

3.1.5.3 Sample Preparation. Note the level of the liquid in each of the containers and determine if any sample was lost during shipment. 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. A diagram illustrating sample preparation and

analysis procedures for each of the sample train components is shown in Figure 3.1-3.

3.1.5.3.1 Container No. 1 (Filter). If particulate emissions are being determined, then desiccate the filter and filter catch without added heat and weigh to a constant weight as described in section 4.3 of method 5. For analysis of metals, divide the filter with its filter catch into portions containing approximately 0.5 g each and place into the analyst's choice of either individual microwave pressure relief vessels or Parr® Bomb. Add 6 ml of concentrated nitric acid and 4 ml of concentrated hydrofluoric acid to each vessel. For microwave heating, microwave the sample vessels for approximately 12-15 minutes in intervals of 1 to 2 minutes at 600 Watts. For conventional heating, heat the Parr Bomb at 140°C (285°F) for 6 hours. Cool the samples to room temperature and combine with the acid digested probe rinse as required in section 3.1.5.3.3, below.

NOTES: 1. Suggested microwave heating times are approximate and are dependent upon the number of samples being digested. Twelve to 15 minute heating times have been found to be acceptable for simultaneous digestion of up to 12 individual samples. Sufficient heating is evidenced by sorbent reflux within the vessel.

2. If the sampling train uses an optional cyclone, the cyclone catch should be prepared and digested using the same procedures described for the filters and combined with the digested filter samples.

3.1.5.3.2 Container No. 2 (Acetone Rinse). Note the level of liquid in the container and confirm on the analysis sheet whether leakage occurred during transport. 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. Measure the liquid in this container either volumetrically to ± 1 ml or gravimetrically to ± 0.5 g. Transfer the contents to an acid-cleaned, tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. If particulate emissions are being determined, desiccate for 24 hours without added heat, weigh to a constant weight according to the procedures described in section 4.3 of method 5, and report the results to the nearest 0.1 mg. Redissolve the residue with 10 ml of concentrated nitric acid and, carefully with stirring, quantitatively combine the resultant sample including all liquid and any particulate matter with Container No. 3 prior to beginning the following section 3.1.5.3.3.

Following section 3.1.5.3.3. Container No. 3 (Probe Rinse). The pH of this sample shall be 2 or lower. If the pH is higher, the sample should be acidified to pH 2 by the careful addition with stirring of concentrated nitric acid. The sample should be rinsed into a beaker with water and the beaker should be covered with a Teflon watchglass. The sample volume should be reduced to approximately 20 ml by heating on a hot plate at a temperature just below boiling. Digest the sample in microwave vessels or Parr® Bombs by quantitatively transferring the sample to the vessel or bomb, by carefully adding the 6 ml of concentrated nitric acid and 4 ml of concentrated hydrofluoric acid and then continuing to follow the procedure described in section 3.1.5.3.1; then combine the resultant sample directly with the acid digested portions of the filter prepared previously in sections 3.1.5.3.1. The resultant combined sample is referred to as Fraction 1 precursor. Filter the combined solution of the acid digested filter and probe rinse samples using Whatman 541 filter paper. Dilute to 500 ml (or the appropriate volume for the expected metals concentration) with water. This dilution is Fraction 1. Measure and record the volume of Fraction 1 solution to within 0.1 ml.

0.1 ml. Quantitatively remove a 50-ml aliquot and label as Fraction 1B. Label the remaining 250-ml portion as Fraction 1A. Fraction 1A is used for ICAP or AAS analysis. Fraction 1B is used for the determination of front-half mercury.

3.1.5.3.4. Container No. 4 (Implanters 1-3). Measure and record the total volume of this sample (Fraction 2) to within 0.5 ml. Remove a 75- to 100-ml aliquot for mercury analysis and label as Fraction 2B. Label the remaining portion of Container No. 4 as aliquot Fraction 2A. Aliquot Fraction 2A defines the volume of 2A *prior* to digestion. All of the aliquot Fraction 2A is digested to produce concentrated Fraction 2A. Concentrated Fraction 2A defines the volume of 2A *after* digestion which is normally 150 ml. Only concentrated Fraction 2A is analyzed for metals (except that it is not analyzed for mercury). The Fraction 2B aliquot should be prepared and analyzed for mercury as described in section 3.1.5.4.3. Aliquot Fraction 2A shall be pH 2 or lower. If necessary, use concentrated nitric acid, by careful addition and stirring, to lower aliquot Fraction 2A to pH 2. The sample should be rinsed into a beaker with water and the beaker should be covered with a ribbed watchglass. The sample volume should be reduced to approximately 20 ml by heating on a hot plate at a temperature just below boiling. Next follow either the conventional or microwave digestion procedures described in sections 3.1.5.3.4.1 and 3.1.5.3.4.2, below.

3.1.5.3.4.1 Conventional Digestion Procedure. Add 30 ml of 50 percent nitric acid and heat for 30 minutes on a hot plate to just below boiling. Add 10 ml of 3 percent hydrogen peroxide and heat for 20 more minutes. Add 50 ml of hot water and heat the sample for an additional 20 minutes. Cool, filter the sample, and dilute to 150 ml (or the appropriate volume for the expected metals concentrations) with water. This dilution is concentrated Fraction 2A. Measure and record the volume of the Fraction 2A solution to within 0.1 ml.

3.1.3.4.2. **Microwave Digestion Procedure.** Add 10 ml of 50 percent nitric acid and heat for 6 minutes in intervals of 1 to 2 minutes at 600 Watts. Allow the sample to cool. Add 10 ml of 3 percent hydrogen peroxide and heat for 2 more minutes. Add 50 ml of hot water and heat for an additional 5 minutes. Cool, filter the sample, and dilute to 150 ml (for the appropriate volume for the expected metals concentrations) with water. This dilution is concentrated Fraction 2A. Measure and record the volume of the Fraction 2A solution to within 0.1 ml.

NOTE: All microwave heating times given are approximate and are dependent upon the number of samples being digested at a time. Heating times as given above have been found acceptable for simultaneous digestion of up to 12 individual samples. Sufficient

heating is evidenced by solvent reflux within the vessel.

3.1.5.3.5 Container Nos. 5A, 5B, and 5C (Impingers 4, 5, and 6). Keep these samples separate from each other and measure and record the volumes of 5A and 5B separately to within 0.5 ml. Dilute sample 5C to 500 ml with water. These samples 5A, 5B, and 5C are referred to respectively as Fractions 3A, 3B, and 3C. Follow the analysis procedures described in section 3.1.5.4.3.

Because the permanganate rinse and water rinses have the capability to recover a high percentage of the mercury from the permanganate impingers, the amount of mercury in the HCl rinse (Fraction 3C) may be very small, possibly even insignificantly small. However, as instructed in this method, add the total of any mercury measured in and calculated for the HCl rinse (Fraction 3C) to that for Fractions 1B, 2B, 3A, and 3B for calculation of the total sample mercury concentration.

3.1.5.3.6 Container No. 6 (Silica Gel).

Weigh the spent silica gel (or silica gel plus impinger) to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

3.1.5.4 Sample Analysis. For each sampling train, seven individual samples are generated for analysis. A schematic identifying each sample and the prescribed sample preparation and analysis scheme is shown in Figure 3.1-3. The first two samples, labeled Fractions 1A and 1B, consist of the digested samples from the front half of the train. Fraction 1A is for ICAP or AAS analysis as described in sections 3.1.5.4.1 and/or 3.1.5.4.2. Fraction 1B is for determination of front-half mercury as described in section 3.1.5.4.3.

The back half of the train was used to prepare the third through seventh samples. The third and fourth samples, labeled Fractions 2A and 2B, contain the digested samples from the moisture knockout. If used, and HNO₃/H₂O₂ impingers 1 through 3. Fraction 2A is for ICAP or AAS analysis. Fraction 2B will be analyzed for mercury.

The fifth through seventh samples, labeled Fractions 3A, 3B, and 3C, consist of the impinger contents and rinses from the empty and permanganate impingers 4, 5, and 6. These samples are analyzed for mercury as described in section 3.1.5.4.3. The total back-half mercury catch is determined from the sum of Fraction 2B and Fractions 3A, 3B, and 3C.

3.1.5.4.1 ICAP Analysis. Fraction 1A and Fraction 2A are analyzed by ICAP using EPA

SW-846 method 8010 or method 200.7 (40 CFR 136, appendix C). Calibrate the ICAP, and set up an analysis program as described in method 8010 or method 200.7. The quality control procedures described in section 3.1.7.3.1 of this method shall be followed. Recommended wavelengths for use in the analysis are listed below:

Element	Wavelength (nm)
Aluminum	308.215
Antimony	208.833
Arsenic	193.896
Barium	455.403
Beryllium	313.042
Cadmium	228.502
Chromium	267.716
Copper	324.754
Iron	259.940
Lead	220.353
Manganese	257.610
Nickel	231.604
Phosphorus	214.914
Selenium	196.026
Silver	328.068
Thallium	190.864
Zinc	213.856

The wavelengths listed are recommended because of their sensitivity and overall acceptance. Other wavelengths may be substituted if they can provide the needed sensitivity and are treated with the same corrective techniques for spectral interference.

Initially, analyze all samples for the desired target metals (except mercury) plus iron and aluminum. If iron and aluminum are present in the sample, the sample may have to be diluted so that each of these elements is at a concentration of less than 50 ppm to reduce their spectral interferences on arsenic, cadmium, chromium, and lead.

NOTE. When analyzing samples in a hydrofluoric acid matrix, an alumina torch should be used; since all front-half samples will contain hydrofluoric acid, use an alumina torch.

3.1.5.4.2 AAS by Direct Aspiration and/or Graphite Furnace. If analysis of metals in Fraction 1A and Fraction 2A using graphite furnace or direct aspiration AAS is desired, Table 3.1-2 should be used to determine which techniques and methods should be applied for each target metal. Table 3.1-2 should also be consulted to determine possible interferences and techniques to be followed for their minimization. Calibrate the instrument according to section 3.1.6.3 and follow the quality control procedures specified in section 3.1.7.3.2.

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TABLE 3.1-2—APPLICABLE TECHNIQUES, METHODS, AND MINIMIZATION OF INTERFERENCE FOR AAS ANALYSIS

Metal	Technique	SW-846 Method No.	Wavelength (nm)	Cause	Interferences
Sb	Aspiration	7040	217.6	1000 ng/ml Pb, Ni, Cu, or cad.	Use secondary wavelength of 231.1 nm; match sample & standards' acid concentration or use nitrous oxide/acetylene flame.
Sb	Furnace	7041	217.6	High Pb	Secondary wavelength or Zeeman correction.
As	Furnace	7060	183.7	Arsenic volatilization	Spiked samples and add nickel nitrate solution to digestates prior to analysis.
Ba	Aspiration	7060	553.6	Aluminum	Use Zeeman background correction.
Ba	Aspiration	7060	553.6	Cadmium	High hollow cathode current and narrow band set.
Ba	Aspiration	7060	553.6	Barium ionization	2 mL of KCl per 100 mL of sample.
Ba	Aspiration	7060	553.6	500 ppm Al	Add 0.1% fluoride.
Ba	Aspiration	7060	553.6	High Mg and Si	Use method of standard additions.
Ba	Aspiration	7060	553.6	Ba in optical path	Optimize parameters to minimize effects.
Cd	Aspiration	7130	228.8	Absorption and light scattering	Background correction is required.
Cd	Furnace	7131	228.8	As above	As above.
Cr	Aspiration	7190	357.9	Excess chloride	Ammonium phosphate used as a matrix modifier.
Cr	Aspiration	7191	357.9	Pipe tips	Use cadmium-free tips.
Cr	Aspiration	7191	357.9	Alkali metal	KCl ionization suppressant in samples and standards.
Cu	Aspiration	7210	324.7	Absorption and scattering	Consult manufacturer's literature.
Fe	Aspiration	7390	248.3	Contamination	All calcium nitrate for a known consistent effect and to eliminate effect of phosphate.
Pb	Aspiration	7420	283.3	217.0 nm alternate	Consult manufacturer's manual.
Pb	Furnace	7421	283.3	Poor recoveries	Great care taken to avoid contamination.
Mn	Aspiration	7460	279.5	403.1 nm alternate	Background correction required.
Ni	Aspiration	7520	232.0	352.4 nm alternate	Background correction required.
Se	Furnace	7740	196.0	Fe, Co, and Cr	Main matrix matching or nitrous oxide/acetylene flame.
Ag	Aspiration	7760	328.1	Nonlinear response	Sample dilution or use 352.3 nm line.
Ag	Aspiration	7760	328.1	Volatility	Spiked samples and reference materials and add nickel nitrate to maintain volatility.
Ti	Aspiration	7840	276.8	Absorption & scatter	Background correction is required and Zeeman background correction can be used.
Ti	Furnace	7841	276.8	Absorption & scatter	Background correction is required.
Zn	Aspiration	7950	213.9	AgCl matrix	Avoid hydrochloric acid unless silver is in solution as a chloride complex.
				Viscosity	Sample and standards monitored for aspiration rate.
				Hydrochloric acid or chloride	Background correction is required. Hydrochloric acid should not be used.
				High Sn, Cu, & P	Background correction is required. Verify that bases are not occurring for volatilization by spiked samples or standard addition; Palladium is a suitable matrix modifier.
				Contamination	Selenium removes Cu and phosphate. Great care taken to avoid contamination.

3.1.5.4.3 Cold Vapor AAS Mercury Analysis.

In EPA SW-846 method 7470 or In Standard Methods for Water and Wastewater Analysis, 15th Edition, Method 303F. Set up the calibration curve (zero to 1000 ng) as described in mercury spectroscopy following the method outlined SW-846 method 7470 or similar to method

303F, using 300-ml BOD bottles instead of Erlenmeyer's. Dilute separately, as described below, a 1 ml to 10 ml aliquot of each original sample to 100 ml with water. Record the amount of the aliquot used for dilution to 100 ml. If no prior knowledge exists of the expected amount of mercury in the sample, a 5-ml aliquot is suggested for the first dilution to 100 ml and analysis. To determine the stack emission value for mercury, the amount of the aliquot of the sample used for dilution and analysis is dependent on the amount of mercury in the aliquot. The total amount of mercury in the aliquot used for analysis shall be less than 1 µg, and within the range (zero to 1000 ng) of the calibration curve. Place each sample aliquot into a separate 300-ml BOD bottle and add enough Type II water to make a total volume of 100 ml. Then analyze the 100 ml for mercury by adding to it sequentially the sample preparation solutions and performing the sample preparation and analysis as described in the procedures of SW-846 method 7470 or method 303F. If, during the described analysis, the reading maximum(s) are off-scale (because the aliquot of the original sample analyzed contained more mercury than the maximum of the calibration range) including the analysis of the 100-ml dilution of the 1-ml aliquot of the original sample causing a reading maximum which is off-scale, then perform the following: Dilute the original sample (or a portion of it) with 0.15% HNO₃ in water (1.5 ml concentrated HNO₃ per liter aqueous solution) so that when a 1-ml to 10-ml aliquot of the dilution of the original sample is then further diluted to 100 ml in the BOD bottle, and analyzed by the procedures described above, it will yield an analysis within the range of the calibration curve.

3.1.6 Calibration

Maintain a laboratory log of all calibrations.

3.1.6.1 Sampling Train Calibration. Calibrate the sampling train components according to the indicated sections of method 5: Probe Nozzle (section 5.1); Pitot Tube (section 5.2); Metering System (section 5.3); Probe Heater (section 5.4); Temperature Gauges (section 5.5); Leak-Check of the Metering System (section 5.6); and Barometer (section 5.7).

3.1.6.2 Inductively Coupled Argon Plasma Spectrometer Calibration. Prepare standards as outlined in section 3.1.4.4. Profile and calibrate the instrument according to the instrument manufacturer's recommended procedures using the above standards. The instrument calibration should be checked once per hour. If the instrument does not reproduce the concentrations of the standard within 10 percent, the complete calibration procedures should be performed.

3.1.6.3 Atomic Absorption Spectrometer—Direct Aspiration, Graphite Furnace and

Cold Vapor Mercury Analyzes. Prepare the standards as outlined in section 3.1.4.4. Calibrate the spectrometer using these prepared standards. Calibration procedures are also outlined in the EPA methods referred to in Table 3.1-2 and in SW-846 Method 7470 or Standard Methods for Water and Wastewater, 15th Edition, method 303F (for mercury). Each standard curve should be run in duplicate and the mean values used to calculate the calibration line. The instrument should be recalibrated approximately once every 10 to 12 samples.

3.1.7 Quality Control

3.1.7.1 Sampling. Field Reagent Blanks. When analyzed, the blank samples in Container Numbers 7 through 12 produced previously in sections 3.1.5.2.7 through 3.1.5.2.12, respectively, shall be processed, digested, and analyzed as follows: Digest and process one of the filters from Container No. 12 per section 3.1.5.3.1, 100 ml from Container No. 7 per section 3.1.5.3.2, and 100 ml from Container No. 8A per section 3.1.5.3.3. This produces Fraction Blank 1A and Fraction Blank 1B from Fraction Blank 1. (If desired, the other two filters may be digested separately according to section 3.1.5.3.1, diluted separately to 300 ml each, and analyzed separately to produce a blank value for each of the two additional filters. If these analyses are performed, they will produce two additional values for each of Fraction Blank 1A and Fraction Blank 1B. The three Fraction Blank 1A values will be calculated as three values of M_{1A} in Equation 3 of section 3.1.8.4.3, and then the three values shall be totalled and divided by 3 to become the value M_{1A} to be used in the computation of M_i by Equation 3. Similarly, the three Fraction Blank 1B values will be calculated separately as three values, totalled, averaged, and used as the value for Hg_{1B} in Equation 8 of section 3.1.8.5.3. The analyses of the two extra filters are optional and are not a requirement of this method, but if the analyses are performed, the results must be considered as described above.) Combine 100 ml of Container No. 8A with 200 ml of the contents of Container No. 9 and digest and process the resultant volume per section 3.1.5.3.4. This produces concentrated Fraction Blank 2A and Fraction Blank 2B from Fraction Blank 2A. A 100-ml portion of Container No. 8A is Fraction Blank 3A. Combine 100 ml of the contents of Container No. 10 with 33 ml of the contents of Container No. 8B. This produces Fraction Blank 3B (use 400 ml as the volume of Fraction Blank 3B when calculating the blank value. Use the actual volumes when calculating all the other blank values). Dilute 225 ml of the contents of Container No. 11 to 500 ml with water. This produces Fraction Blank 3C. Analyze Fraction Blank 1A and Fraction Blank 2A per section 3.1.5.4.1

and/or 3.1.5.4.2. Analyze Fraction Blank 1B, Fraction Blank 2B, and Fraction Blank 3A, 3B, and 3C per section 3.1.5.4.3. The analysis of Fraction Blank 1A produces the front-half reagent blank correction values for the metals except mercury; the analysis of Fraction Blank 1B produces the front-half reagent blank correction value for mercury. The analysis of concentrated Fraction Blank 2A produces the back-half reagent blank correction values for the metals except mercury, while separate analysis of Fraction Blanks 2B, 3A, 3B, and 3C produce the back-half reagent blank correction value for mercury.

3.1.7.2 An attempt may be made to determine if the laboratory reagents used in section 3.1.5.3 caused contamination. They should be analyzed by the procedures in section 3.1.5.4. The Administrator will determine whether the laboratory blank reagent values can be used in the calculation of the stationary source test results.

3.1.7.3 Quality Control Samples. The following quality control samples should be analyzed.

3.1.7.3.1 ICAP Analysis. Follow the quality control shown in section 8 of method 6010. For the purposes of a three-run test series, these requirements have been modified to include the following: Two instrument check standard runs, two calibration blank runs, one interference check sample at the beginning of the analysis (must be within 25% or analyze by the method of standard additions), one quality control sample to check the accuracy of the calibration standards (must be within 25% of calibration), and one duplicate analysis (must be within 10% of average or repeat all analyses).

3.1.7.3.2 Direct Aspiration and/or Graphite Furnace AAS Analysis for antimony, arsenic, barium, beryllium, cadmium, copper, chromium, lead, nickel, manganese, mercury, phosphorus, selenium, silver, thallium, and zinc. All samples should be analyzed in duplicate. Perform a matrix spike on at least one front-half sample and one back-half sample or one combined sample. If recoveries of less than 75 percent or greater than 125 percent are obtained for the matrix spike, analyze each sample by the method of standard additions. A quality control sample should be analyzed to check the accuracy of the calibration standards. The results must be within 10% of the calibration repeated.

3.1.7.3.3 Cold Vapor AAS Analysis for Mercury. All samples should be analyzed in duplicate. A quality control sample should be analyzed to check the accuracy of the calibration standards (within 15% or repeat calibration). Perform a matrix spike on one sample from the nitric impinger portion (must be within 25% or samples must be analyzed by the method of standard additions). Additional information on quality control can be obtained from EPA SW-846 method 7470 or in Standard Methods for the Examination of

Water and Wastewater, 15th Edition, method 303F.

3.1.8 Calculations

3.1.8.1 Dry Gas Volume. Using the data from this test, calculate V_{measured} , the dry gas sample volume at standard conditions as outlined in Section 6.3 of Method 5.

3.1.8.2 Volume of Water Vapor and Moisture Content. Using the data obtained from vapor V_{measured} and the moisture content B_w of the stack gas. Use Equations 5-2 and 5-3 of Method 5.

3.1.8.3 Stack Gas Velocity. Using the data from this test and Equation 2-9 of Method 2, calculate the average stack gas velocity.

3.1.8.4 Metals (Except Mercury) in Source Sample.

3.1.8.4.1 Fraction 1A, Front Half, Metals (except Hg). Calculate separately the amount of each metal collected in Fraction 1 of the sampling train using the following equation:

$$M_1 = C_1 \cdot F_1 \cdot V_{\text{stack}} \quad \text{Eq. 1}^*$$

where:

M_1 = total mass of each metal (except Hg) collected in the front half of the sampling train (Fraction 1), µg.

C_1 = concentration of metal in sample Fraction 1A as read from the standard curve (µg/ml).

F_1 = dilution factor (F_1 = the inverse of the fractional portion of the concentrated sample in the solution actually used in the instrument to produce the reading C_1). For example, when 2 ml of Fraction 1A are diluted to 10 ml, $F_1 = 5$.

$V_{\text{stack}} = \text{total volume of digested sample solution (Fraction 1), ml.}$

3.1.8.4.2 Fraction 2A, Back Half, Metals (except Hg). Calculate separately the amount of each metal collected in Fraction 2 of the sampling train using the following equation:

$$M_2 = C_2 \cdot F_2 \cdot V_2 \quad \text{Eq. 2}^*$$

where:

M_2 = total mass of each metal (except Hg) collected in the back half of the sampling train (Fraction 2), µg.

C_2 = concentration of metal in sample concentrated Fraction 2A, as read from the standard curve (µg/ml).

F_2 = aliquot factor, volume of Fraction 2 divided by volume of aliquot Fraction 2A (see section 3.1.5.3.4).

V_2 = total volume of digested sample solution (concentrated Fraction 2A), ml (see section 3.1.5.3.4.1 or 3.1.5.3.4.2, as applicable).

* If Fractions 1A and 2A are combined, proportional aliquots must be used. Appropriate changes must be made in Equations 1-3 to reflect this approach.

3.1.8.4.3 Total Train, Metals (except Hg). Calculate the total amount of each of the quantified metals collected in the sampling train as follows:

$$M_t = (M_m - M_{mb}) + (M_{sb} - M_{mb}) \quad \text{Eq. 3}$$

where:

M_t =total mass of each metal (separately sampled for each metal) collected in the sampling train, μg .

M_{mb} =blank correction value for mass of metal detected in front-half field reagent blank, μg .

M_{sb} =blank correction value for mass of metal detected in back-half field reagent blank, μg .

NOTE: If the measured blank value for the front half (m_{mb}) is in the range 0.0 to 1 μg (where 1 μg equals the value determined by multiplying 1.4 μg per square inch (1.4 $\mu\text{g}/\text{in}^2$) times the actual area in square inches (in^2) of the filter used in the emission sample) m_{mb} may be used to correct the emission sample value (m_m); if m_{mb} exceeds 1 μg , the greater of the two following values (either I. or II.) may be used:

- 1 μg , or
- the lesser of (a) m_{mb} , or (b) 5 percent of m_m .

If the measured blank value for the back half (m_{sb}) is in the range 0.0 to 1 μg , m_{sb} may be used to correct the emission sample value (m_{sb}); if m_{sb} exceeds 1 μg , the greater of the two following values may be used: 1 μg or 5 percent of m_{sb} .

3.1.8.5 Mercury in Source Sample. 3.1.8.5.1 Fraction 1B, Front Half, Hg. Calculate the amount of mercury collected in the front half, Fraction 1, of the sampling train using the following equation:

$$H_{gm} = \frac{Q_m}{V_{sa}} \times V_{soln.1} \quad \text{Eq. 4}$$

where:

H_{gm} =total mass of mercury collected in the front half of the sampling train (Fraction 1), μg .

Q_m =quantity of mercury in analyzed sample, μg .

V_{sa} =total volume of digested sample solution (Fraction 1), ml.

V_{sa} =volume of Fraction 1B analyzed, ml. See the following notice.

NOTE: V_{sa} is the actual amount of Fraction 1B analyzed. For example, if 1 ml of Fraction 1B were diluted to 100 ml to bring it into the proper analytical range, and 1 ml of the 100-ml dilution were analyzed, V_{sa} would be 0.01 ml.

3.1.8.5.2 Fraction 2B and Fractions 3A, 3B, and 3C, Back Half, Hg. Calculate the amount of mercury collected in Fractions 2 using Equation 6 and in Fractions 3A, 3B, and 3C using Equation 6. Calculate the total amount

of mercury collected in the back half of the sampling train using Equation 7.

$$H_{gbs} = \frac{Q_{bs}}{V_{sa}} \times V_{soln.2} \quad \text{Eq. 5}$$

where:

H_{gbs} =total mass of mercury collected in Fraction 2, μg .

Q_{bs} =quantity of mercury in analyzed sample, μg .

V_{sa} =total volume of Fraction 2, ml. V_{sa} =volume of Fraction 2B analyzed, ml (see the following note).

NOTE: V_{sa} is the actual amount of Fraction 2B analyzed. For example, if 1 ml of Fraction 2B were diluted to 10 ml to bring it into the proper analytical range, and 5 ml of the 10-ml dilution was analyzed, V_{sa} would be 0.5.

Use Equation 6 to calculate separately the back-half mercury for Fractions 3A, then 3B, then 3C.

$$H_{gbs(A,B,C)} = \frac{Q_{bs(A,B,C)}}{V_{sa(A,B,C)}} \times V_{soln.3(A,B,C)} \quad \text{Eq. 6}$$

where:

$H_{gbs(A,B,C)}$ =total mass of mercury collected separately in Fraction 3A, 3B, or 3C, μg . $Q_{bs(A,B,C)}$ =quantity of mercury in separately analyzed samples, μg .

$V_{sa(A,B,C)}$ =volume of Fraction 3A, 3B, or 3C analyzed, ml (see Note in sections 3.1.8.5.1 and 3.1.8.5.2, and calculate similarly).

$V_{soln.3(A,B,C)}$ =total volume of Fraction 3A, 3B, or 3C, ml.

$H_{gm} = H_{gm} + H_{gbs(A)} + H_{gbs(B)} + H_{gbs(C)}$ Eq. 7

where:

H_{gm} =total mass of mercury collected in the back half of the sampling train, μg .

3.1.8.5.3 Total Train Mercury Catch. Calculate the total amount of mercury collected in the sampling train using Equation 8.

$$H_g = (H_{gm} - H_{gmb}) + (H_{gbs} - H_{gbsb}) \quad \text{Eq. 8}$$

where:

H_g =total mass of mercury collected in the sampling train, μg .

H_{gmb} =blank correction value for mass of mercury detected in front-half field reagent blank, μg .

H_{gbsb} =blank correction value for mass of mercury detected in back-half field reagent blank, μg .

NOTE: If the total of the measured blank values ($H_{gmb} + H_{gbsb}$) is in the range of 0 to 6 μg , then the total may be used to correct the emission sample value ($H_{gm} + H_{gbs}$); if it exceeds 6 μg , the greater of the following two values may be used: 6 μg or 5 percent of the emission sample value ($H_{gm} + H_{gbs}$).

3.1.8.6 Metal Concentration of Stack Gas. Calculate each metal separately for the cad-

mium, total chromium, arsenic, nickel, manganese, beryllium, copper, lead, phosphorus, thallium, silver, barium, zinc, selenium, antimony, and mercury concentrations in the stack gas (dry basis, adjusted to standard conditions) as follows:

$$C_s = K_s (M_s / V_{ms}) \quad \text{Eq. 9}$$

where:

C_s =concentration of each metal in the stack gas, ng/dscm.

$K_s = 10^{-6} \text{ ng}/\mu\text{g}$.

M_s =total mass of each metal collected in the sampling train, μg ; (substitute Hg for Mn for the mercury calculation).

V_{ms} =volume of gas sample as measured by the dry gas meter, corrected to dry standard conditions, dscm.

3.1.8.7 Isokinetic Variation and Acceptable Results. Same as method 5, sections 6.11 and 6.12, respectively.

3.1.9 Bibliography

3.1.9.1 Method 803F in Standard Methods for the Examination of Water and Wastewater, 15th Edition, 1980. Available from the American Public Health Association, 1015 18th Street NW., Washington, DC 20036.

3.1.9.2 EPA Methods 6010, 7000, 7041, 7060, 7131, 7421, 7470, 7740, and 7841. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods SW-846, Third Edition, September 1988. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC 20460.

3.1.9.3 EPA Method 200.7, Code of Federal Regulations, title 40, part 186, appendix C, July 1, 1987.

3.1.9.4 EPA Methods 1 through 5, and 12 Code of Federal Regulations, title 40, part 60, appendix A, July 1, 1987.

3.2 Determination of Hexavalent Chromium Emissions from Stationary Sources (Method Cr⁺⁺)

3.2.1 Applicability and Principle

3.2.1.1 Applicability. This method applies to the determination of hexavalent chromium (Cr⁺⁺) emissions from hazardous waste incinerators, municipal waste combustors, sewage sludge incinerators, and boilers and industrial furnaces. With the approval of the Administrator, this method may also be used to measure total chromium. The sampling train, constructed of Teflon components, has only been evaluated at temperatures less than 300 °F. Trains constructed of other materials, for testing at higher temperatures, are currently being evaluated.

3.2.1.2 Principle. For incinerators and combustors, the Cr⁺⁺ emissions are collected isokinetically from the source. To eliminate the possibility of Cr⁺⁺ reduction between the nozzle and impinger, the emission samples are collected with a recirculatory train

where the impinger reagent is continuously recirculated to the nozzle. Recovery procedures include a post-sampling purge and filtration. The impinger train samples are analyzed for Cr⁺⁺ by an ion chromatograph equipped with a post-column reactor and a visible wavelength detector. The ICPCR separates the Cr⁺⁺ as chromate (CrO⁴⁻⁻) from other components in the sample matrices that may interfere with the Cr⁺⁺-specific diphenylcarbazide reaction that occurs in the post-column reactor. To increase sensitivity for trace levels of chromium, a preconcentration system is also used in conjunction with the ICPCR.

3.2.2 Range, Sensitivity, Precision, and Interference

3.2.2.1 Range. Employing a preconcentration procedure, the lower limit of the detection range can be extended to 16 nanograms per dry standard cubic meter (ng/dscm) with a 3 dscm gas sample (0.1 ppb in solution). With sample dilution, there is no upper limit.

3.2.2.2 Sensitivity. A minimum detection limit of 8 ng/dscm with a 3 dscm gas sample can be achieved by preconcentration (0.05 ppb in solution).

3.2.2.3 Precision. The precision of the ICPCR with sample preconcentration is 5 to 10 percent. The overall precision for sewage sludge incinerators emitting 120 ng/dscm of Cr⁺⁺ and 3.5 $\mu\text{g}/\text{dscm}$ of total chromium is 25% and 9% for Cr⁺⁺ and total chromium, respectively; for hazardous waste incinerators emitting 300 ng/dscm of Cr⁺⁺ it is 20 percent.

3.2.2.4 Interference. Components in the sample matrix may cause Cr⁺⁺ to convert to trivalent chromium (Cr³⁺) or cause Cr⁺⁺ to convert to Cr³⁺. A post-sampling nitrogen purge and sample filtration are included to eliminate many of these interferences. The chromatographic separation of Cr⁺⁺ using ion chromatography reduces the potential for other metals to interfere with the post-column reaction. For the ICPCR analysis, only compounds that coelute with Cr⁺⁺ and affect the diphenylcarbazide reaction will cause interference. Periodic analysis of deionized (DI) water blanks is used to demonstrate that the analytical system is essentially free from contamination. Sample cross-contamination that can occur when high-level and low-level samples or standards are analyzed alternately is eliminated by thorough purging of the sample loop. Purging can easily be achieved by increasing the injection volume of the samples to ten times the size of the sample loop.

3.2.3 Apparatus

3.2.3.1 Sampling Train. Schematics of the recirculating sampling trains employed in this method are shown in Figures 3.2-1 and 3.2-2. The recirculatory train is readily as-

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sembled from commercially available components. All portions of the train in contact with the sample are either glass, quartz, Tygon, or Teflon, and are to be cleaned as per subsection 3.2.5.1.1.

The metering system is identical to that specified by Method 5 (see section 3.6.1); the sampling train consists of the following components:

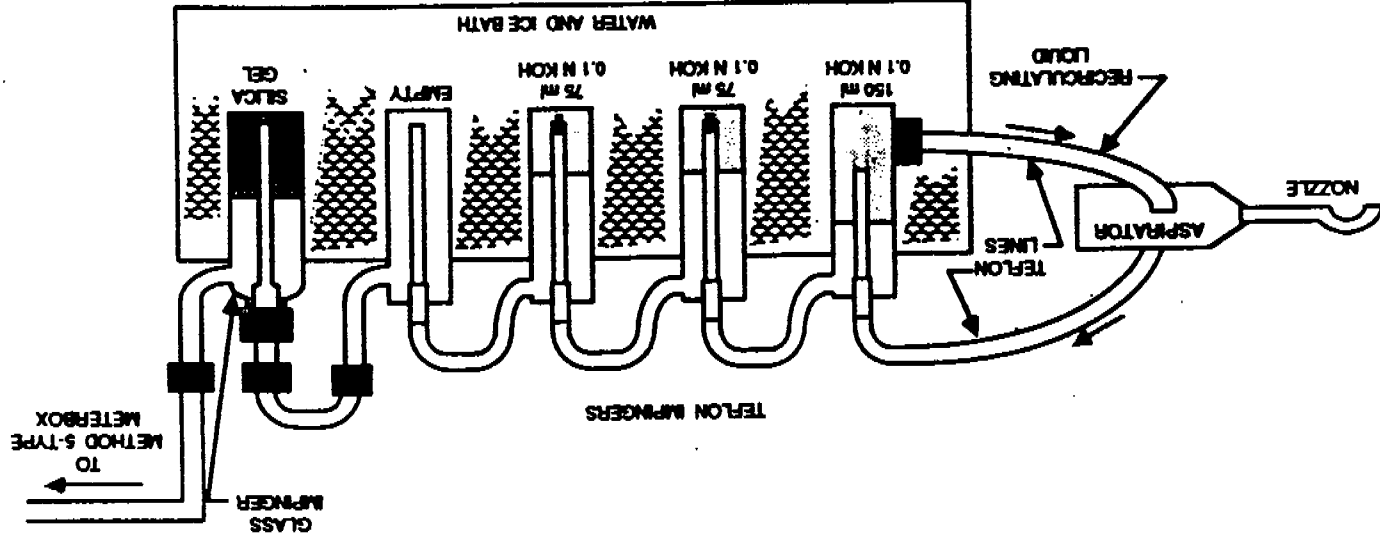


Figure 3.2-1 Schematic of recirculatory impinger train with aspirator assembly.

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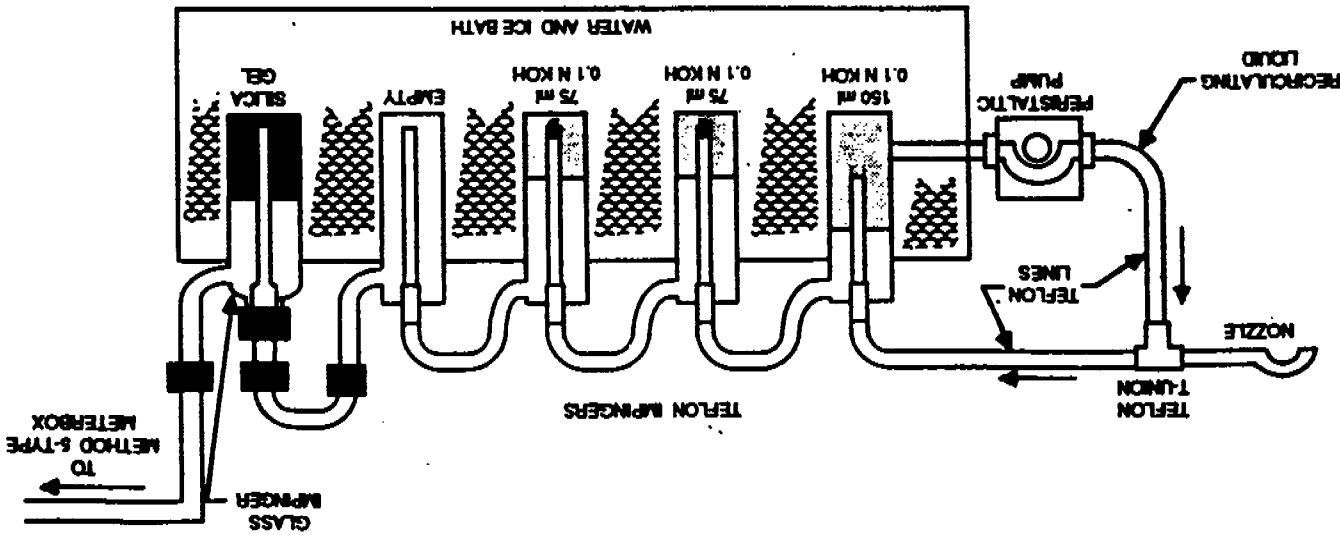


Figure 3.2-2 Schematic of recirculation impinger train with pump/sprayer assembly.

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3.2.3.1.1 Probe Nozzle. Glass or Teflon with a sharp, tapered leading edge. The angle of taper shall be $<30^\circ$ and the taper shall be on the outside to preserve a constant internal diameter. The probe nozzle shall be of the button-hook or elbow design, unless otherwise specified by the Administrator.

A range of nozzle sizes suitable for isokinetic sampling should be available, e.g., 0.32 to 1.27 cm ($1/8$ to $1/2$ in) (or larger if higher volume sample trains are used) inside diameter (ID) nozzles in increments of 0.16 cm ($5/16$ in). Each nozzle shall be calibrated according to the procedures outlined in section 3.2.6.

3.2.3.1.2 Teflon Aspirator or Pump/Sprayer Assembly. Teflon aspirator capable of recirculating absorbing reagent at 50 ml/min while operating at 0.75 cfm. Alternatively, a pump/sprayer assembly may be used instead of the Teflon aspirator. A Teflon union-T is connected behind the nozzle to provide the absorbing reagent/sample gas mix; a peristaltic pump is used to recirculate the absorbing reagent at a flow rate of at least 50 ml/min. Teflon fittings, Teflon ferrules, and Teflon nuts are used to connect a glass or Teflon nozzle, recirculating line, and sample line to the Teflon aspirator or union-T. Tygon, C-flex** or other suitable inert tubing for use with peristaltic pump.

3.2.3.1.3 Teflon Sample Line. Teflon, $1/8$ " outside diameter (OD) and $1/16$ " inside diameter (ID), or $1/8$ " OD x $1/16$ " ID, of suitable length to connect aspirator (or T-union) to first Teflon impinger.

3.2.3.1.4 Teflon Recirculation Line. Teflon, $1/8$ " O.D. and $1/16$ " I.D., of suitable length to connect first impinger to aspirator (or T-union).

3.2.3.1.5 Teflon Impingers. Four Teflon Impingers; Teflon tubes and fittings, such as made by Saville** can be used to construct

*Note: Mention of trade names or specific product does not constitute endorsement by the Environmental Protection Agency.

impingers 2 " diameter by 12 " long, with vacuum-tight $1/8$ " O.D. Teflon compression fittings. Alternatively, standard glass impingers that have been Teflon-lined, with Teflon stems and U-tubes, may be used. Inlet fittings on impinger top to be bored through to accept $1/8$ " O.D. tubing as impinger stem. The second and third $1/8$ " O.D. Teflon stem has a $1/8$ " O.D. Teflon tube, 2 " long inserted at its end to duplicate the effects of the Greenburg-Smith impinger stem. The first impinger stem should extend 2 " from impinger bottom, high enough in the impinger reagent to prevent air from entering recirculating line; the second and third impinger stems should extend to $1/2$ " from impinger bottom. The first impinger should include a $1/8$ " O.D. Teflon compression fitting for recirculation line. The fourth impinger serves as a knockout impinger.

3.2.3.1.6 Glass Impinger. Silica gel impinger. Vacuum-tight impingers, capable of containing 400 g of silica gel, with compatible fittings. The silica gel impinger will have a modified stem ($1/8$ " ID at tip of stem).

3.2.3.1.7 Thermometer. (Identical to that specified by Method 5) at the outlet of the silica gel impinger, to monitor the exit temperature of the gas.

3.2.3.1.8 Metering System. Barometer, and Gas Density Determinations Equipment. Same as method 5, sections 2.1.8 through 2.1.10, respectively.

3.2.3.2 Sample Recovery. Clean all items for sample handling or storage with 10% nitric acid solution by soaking, where possible, and rinse thoroughly with DI water before use.

3.2.3.2.1 Nitrogen Purge Line. Inert tubing and fittings capable of delivering 0 to 1 acf/min (continuously adjustable) of nitrogen gas to the impinger train from a standard gas cylinder (see Figure 3.2.3). Standard $1/8$ -inch Teflon tubing and compression fittings in conjunction with an adjustable pressure regulator and needle valve may be used.

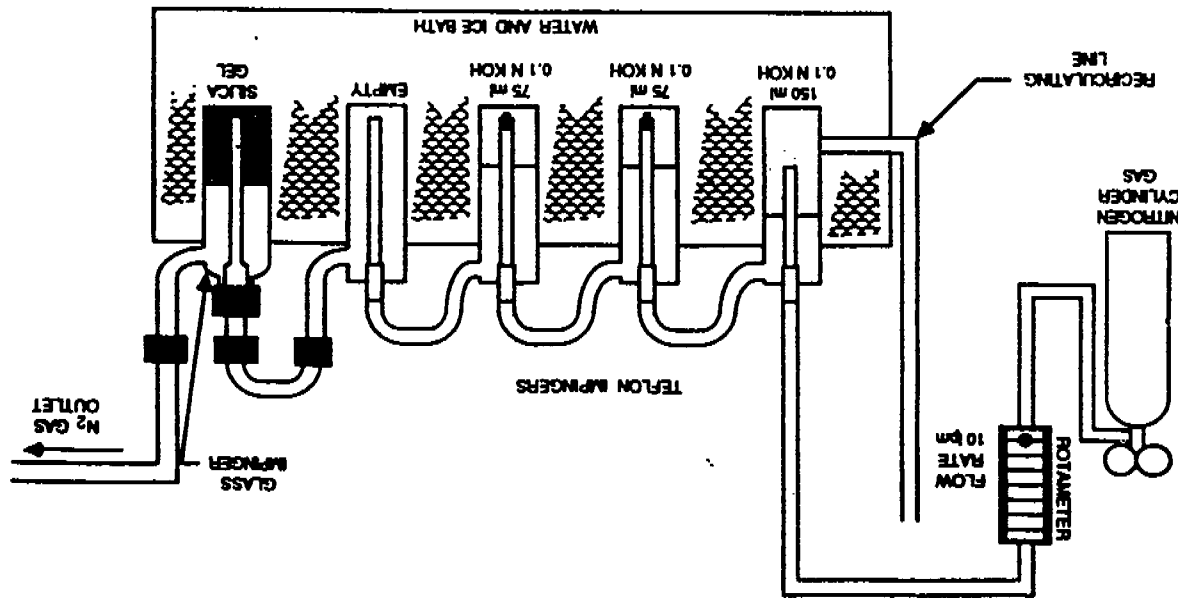


Figure 3.2-3 Schematic of post test nitrogen purge system

3.2.3.2.2 Wash bottles. Two polyethylene wash bottles, for DI water and nitric rinse solution.

3.2.3.2.3 Sample Storage Containers. Polyethylene, with leak-free screw cap, 500-ml or 1000-ml.

3.2.3.2.4 1000-ml Graduated Cylinder.

3.2.3.2.5 Plastic Storage Containers. Air tight containers to store silica gel.

3.2.3.2.6 Funnel and Rubber Policeman. To aid in transfer of silica gel from impinger to storage container; not necessary if silica gel is weighed directly in the impinger.

3.2.3.2.7 Balance.

3.2.3.3 Sample Preparation for Analysis. Sample preparation prior to analysis includes purging the sample train immediately following the sample run, and filtering the recovered sample to remove particulate matter immediately following recovery.

3.2.3.3.1 Beakers, Funnels, Volumetric Flasks, Volumetric Pipets, and Graduated Cylinders. Assorted sizes, Teflon or glass, for preparation of samples, sample dilution, and preparation of calibration standards. Prepare initially following procedure described in section 3.2.5.1.3 and rinse between use with 0.1 N HNO₃ and DI water.

3.2.3.3.2 Filtration Apparatus. Teflon, or equivalent, for filtering samples, and Teflon filter holder. Teflon impinger components have been found to be satisfactory as a sample reservoir for pressure filtration using nitrogen.

3.2.3.4 Analysis.

3.2.3.4.1 IC/PCR System. High performance liquid chromatograph pump, sample injection valve, post-column reagent delivery and mixing system, and a visible detector, capable of operating at 520 nm, all with a non-metallic (or inert) flow path. An electronic recording integrator operating in the peak area mode is recommended, but other recording devices and integration techniques are acceptable provided the repeatability criteria and the linearity criteria for the calibration curve described in section 3.2.5.5 can be satisfied. A sample loading system will be required if preconcentration is employed.

3.2.3.4.2 Analytical Column. A high performance ion chromatograph (HPIC) non-metallic column with anion separation characteristics and a high loading capacity designed for separation of metal chelating compounds to prevent metal interference. Resolution described in section 3.2.5.4 must be obtained. A non-metallic guard column with the same ion-exchange material is recommended.

3.2.3.4.3 Preconcentration Column. An HPIC non-metallic column with acceptable anion retention characteristics and sample loading rates as described in section 3.2.5.5.

3.2.3.4.4 0.45 um filter cartridge. For the removal of insoluble material. To be used just prior to sample injection/analysis.

3.2.4 Reagents

All reagents should, at a minimum, conform to the specifications established by the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. All prepared reagents should be checked by IC/PCR analysis for Cr⁺⁺ to ensure that contamination is below the analytical detection limit for direct injection or, if selected, preconcentration. If total chromium is also to be determined, the reagents should also be checked by the analytical technique selected to ensure that contamination is below the analytical detection limit.

3.2.4.1 Sampling.

3.2.4.1.1 Water. Deionized water. It is recommended that water blanks be checked prior to preparing sampling reagents to ensure that the Cr⁺⁺ content is less than the analytical detection limit.

3.2.4.1.2 Potassium Hydroxide, 0.1 N. Add 5.6 gm of KOH(s) to approximately 900 ml of DI water and let dissolve. Dilute to 1000 ml with DI water.

Note: At sources with high concentrations of acids and/or SO₂, the concentration of KOH should be increased to 0.5 N to ensure that the pH of the solution is above 8.5 after sampling.

3.2.4.1.3 Silica Gel and Crushed Ice. Same as Method 5, sections 3.1.2 and 3.1.4, respectively.

3.2.4.2 Sample Recovery. The reagents used in sample recovery are as follows:

3.2.4.2.1 Water. Same as subsection 3.2.4.1.1.

3.2.4.2.2 Nitric Acid, 0.1 N. Add 6.3 ml of concentrated HNO₃ (70 percent) to a graduated cylinder containing approximately 900 ml of DI water. Dilute to 1000 ml with DI water, and mix well.

3.2.4.2.3 pH Indicator Strip. pH Indicator capable of determining pH of solution between the pH range of 7 and 12, at 0.5 pH intervals.

3.2.4.3 Sample Preparation

3.2.4.3.1 Water. Same as subsection 3.2.4.1.1.

3.2.4.3.2 Nitric Acid, 0.1 N. Same as subsection 3.2.4.2.2.

3.2.4.3.3 Filters. Acetate membrane, or equivalent, filters with 0.45 micrometer or smaller pore size to remove insoluble material.

3.2.4.4 Analysis.

3.2.4.4.1 Chromatographic Eluent. The eluent used in the analytical system is ammonium sulfate based. It is prepared by adding 6.5 ml of 29 percent ammonium hydroxide (NH₄OH) and 33 grams of ammonium sulfate ((NH₄)₂SO₄) to 500 ml of DI water. The mixture should then be diluted to 1 liter with DI water and mixed well. Other combinations of eluents and/or columns may be employed provided peak resolution, as described in sec-

tion 3.2.5.4, repeatability and linearity, as described in section 3.2.6.2, and analytical sensitivity are acceptable.

3.2.4.4.2 Post-Column Reagent. An effective post-column reagent for use with the chromatographic eluent described in section 3.2.4.4.1 is a diphenylcarbazide (DPC) based system. Dissolve 0.5 g of 1,5-diphenylcarbazide (DPC) in 100 ml of ACS grade methanol. Add to 500 ml of degassed DI water containing 50 ml of 98 percent spectrophotometric grade sulfuric acid. Dilute to 1 liter with degassed DI water.

3.2.4.4.3 Cr⁺⁺ Calibration Standard. Prepare Cr⁺⁺ standards from potassium dichromate (K₂Cr₂O₇, FW 294.19). To prepare a 1000 µg/ml Cr⁺⁺ stock solution, dissolve 2.829 g of dry K₂Cr₂O₇ in 1 liter of DI water. To prepare working standards, dilute the stock solution to the chosen standard concentrations for instrument calibration with 0.05 N KOH to achieve a matrix similar to the actual field samples.

3.2.4.4.4 Performance Audit Sample. A performance audit sample shall be obtained from the Quality Assurance Division of EPA and analyzed with the field samples. The mailing address to request audit samples is: U.S. Environmental Protection Agency, Atmospheric Research and Exposure Assessment Laboratory, Quality Assurance Division, Source Branch, Mail Drop 77-A, Research Triangle Park, North Carolina 27711. The audit sample should be prepared in a suitable sample matrix at a concentration similar to the actual field samples.

3.2.5 Procedure

SAFETY FIRST—WEAR SAFETY GLASSES AT ALL TIMES DURING THIS TEST METHOD

3.2.5.1 Sampling. The complexity of this method is such that to obtain reliable results, testers should be trained and experienced with test procedures.

3.2.5.1.1 Pretest Preparation. All components shall be maintained and calibrated according to the procedures described in APTD-0576, unless otherwise specified herein.

Rinse all sample train components from the glass nozzle up to the silica gel impinger and sample containers with hot tap water followed by washing with hot soapy water. Next, rinse the train components and sample containers three times with tap water followed by three rinses with DI water. All the components and containers should then be soaked overnight, or a minimum of 4 hours, in a 10 percent (v/v) nitric acid solution, then rinsed three times with DI water. Allow the components to air dry prior to covering all openings with Parafilm, or equivalent.

3.2.5.1.2 Preliminary Determinations. Same as method 5, section 4.1.2.

3.2.5.1.3 Preparation of Sampling Train. Measure 300 ml of 0.1 N KOH into a graduated

cylinder (or tare-weighted precleaned polyethylene container). Place approximately 150 ml of the 0.1 N KOH reagent in the first Teflon impinger. Split the rest of the 0.1 N KOH between the second and third Teflon impingers. The next Teflon impinger is left dry. Place a preweighed 200- to 400-g portion of indicating silica gel in the final glass impinger. (For sampling periods in excess of two hours, or for high moisture sites, 400-g of silica gel is recommended.)

Retain reagent blanks of the 0.1 N KOH equal to the volumes used with the field samples.

3.2.5.1.4 Leak-Check Procedures. Follow the leak-check procedures given in Method 5, section 4.1.4.1 (Pretest Leak-Check). Section 4.1.4.2 (Leak-Checks During the Sample Run), and Section 4.1.4.3 (Post-Test Leak-Checks).

3.2.5.1.5 Sampling Train Operation. Follow the procedures given in method 5, section 4.1.5. The sampling train should be fed down with water and ice to ensure heat transfer with the Teflon impingers.

NOTE: If the gas to be sampled is above 200 °F, it may be necessary to wrap three or four feet of the Teflon sample and recirculating lines inside the ice bath to keep the recirculated reagent cool enough so it does not turn to steam.

For each run, record the data required on a data sheet such as the one shown in Figure 5.2 of method 5.

At the end of the sampling run, determine the pH of the reagent in the first impinger using a pH indicator strip. The pH of the solution shall be greater than 8.5.

3.2.5.1.6 Calculation of Percent Isokinetic. Same as method 5, section 4.1.6.

3.2.5.2 Post-Test Nitrogen Purge. The nitrogen purge is used as a safeguard against the conversion of hexavalent chromium to the trivalent oxidation state. The purge is effective in the removal of SO₂ from the impinger contents.

Attach the nitrogen purge line to the input of the impinger train. Check to ensure the output of the impinger train is open, and that the recirculating line is capped off. Open the nitrogen gas flow slowly and adjust the delivery rate to 10 L/min. Check the recirculating line to ensure that the pressure is not forcing the impinger reagent out through this line. Continue the purge under these conditions for one-half hour, periodically checking the flow rate.

3.2.5.3 Sample Recovery. Begin cleanup procedures as soon as the train assembly has been purged at the end of the sampling run. The probe assembly may be disconnected from the sample train prior to sample purging.

The probe assembly should be allowed to cool prior to sample recovery. Disconnect the umbilical cord from the sample train. When the probe assembly can be safely han-

dled, wipe off all external particulate matter near the tip of the nozzle, and cap the nozzle prior to transporting the sample train to a cleanup area that is clean and protected from the wind and other potential causes of contamination or loss of sample. Inspect the train before and during disassembly and note any abnormal conditions.

3.2.5.3.1 Container No. 1 (Impingers). Disconnect the first impinger from the second impinger and disconnect the recirculation line from the aspirator or peristaltic pump. Drain the Teflon impingers into a precleaned graduated cylinder or tare-weighted precleaned polyethylene sample container and measure the volume of the liquid to within 1 ml or 1 g. Record the volume of liquid present as this information is required to calculate the moisture content of the flue gas sample. If necessary, transfer the sample from the graduated cylinder to a precleaned polyethylene sample container. With DI water, rinse four times the insides of the glass nozzle, the aspirator, the sample and recirculation lines, the impingers, and the connecting tubing, and combine the rinses with the impinger solution in the sample container.

3.2.5.3.2 Container No. 2 (HNO₃). Rinse op-tional (total chromium). With 0.1 N HNO₃, rinse three times the entire train assembly, from the nozzle to the fourth impinger and combine the rinses into a separate precleaned polyethylene sample container for possible total chromium analysis. Repeat the rinse procedure a final time with DI water, and discard the water rinses. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.3 Container No. 3 (Silica Gel). Note the color of the indicating silica gel to determine if it has been completely spent. Quantitatively transfer the silica gel from its impinger to the original container, and seal the container. A funnel and a rubber policeman may be used to aid in the transfer. The small amount of particulate that may adhere to the impinger wall need not be removed. Do not use water or other liquids to transfer the silica gel. Alternatively, if a balance is available in the field, record the weight of the spent silica gel (or the silica gel plus impinger) to the nearest 0.5 g.

3.2.5.3.4 Container No. 4 (0.1 N KOH Blank). Once during each field test, place a volume of reagent equal to the volume placed in the sample train into a precleaned

polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.5 Container No. 5 (DI Water Blank). Once during each field test, place a volume of DI water equal to the volume employed to rinse the sample train into a precleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.3.6 Container No. 6 (0.1 N HNO₃ Blank). Once during each field test if total chromium is to be determined, place a volume of 0.1 N HNO₃ reagent equal to the volume employed to rinse the sample train into a precleaned polyethylene sample container, and seal the container. Mark the height of the fluid level on the container or, alternatively if a balance is available, weigh the container and record the weight to permit determination of any leakage during transport. Label the container clearly to identify its contents.

3.2.5.4 Sample Preparation. For determination of Cr⁺⁺, the sample should be filtered immediately following recovery to remove any insoluble matter. Nitrogen gas may be used as a pressure assist to the filtration process (see Figure Cr⁺⁺-4).

Filter the entire impinger sample through a 0.45-micrometer acetate filter (or equivalent), and collect the filtrate in a 1000-ml graduated cylinder. Rinse the sample container with DI water three separate times, pass these rinses through the filter, and add the rinses to the sample filtrate. Rinse the Teflon reservoir with DI water three separate times, pass these rinses through the filter, and add the rinses to the sample filtrate. Determine the final volume of the filtrate and rinses and return them to the rinsed polyethylene sample container. Label the container clearly to identify its contents. Rinse the Teflon reservoir once with 0.1 N HNO₃, and once with DI water and discard these rinses.

If total chromium is to be determined, quantitatively recover the filter and residue and place them in a vial. (The acetate filter may be digested with 5 ml of 70 percent nitric acid; this digestion solution may then be diluted with DI water for total chromium analysis.)

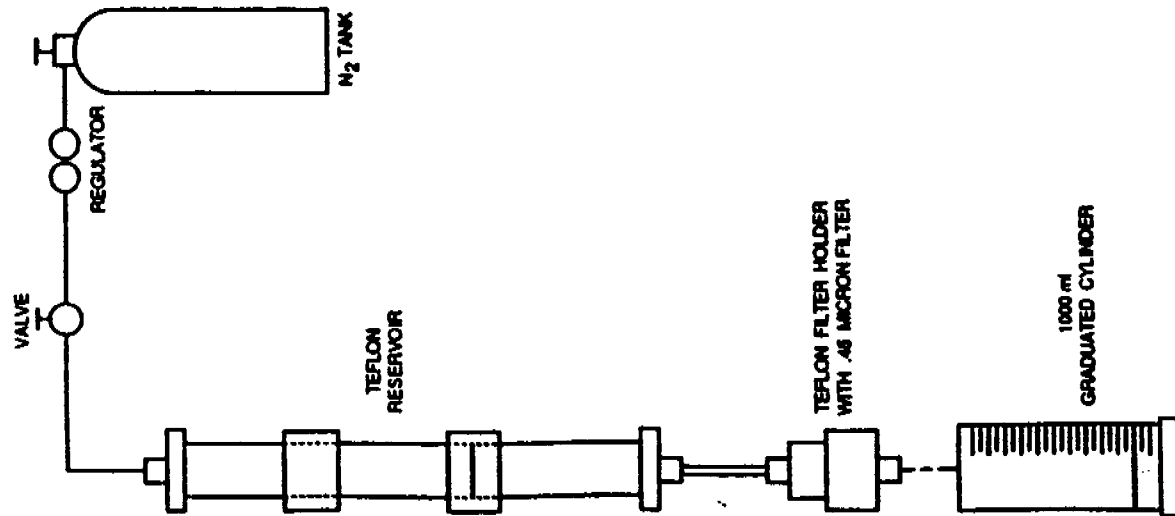


Figure 3.2-4 Schematic of sample filter system.

NOTE: If the source has a large amount of particulate in the effluent stream, testing teams may wish to filter the sample twice, once through a 2 to 5-micrometer filter, and then through the 0.45-micrometer filter.

3.2.5.4.1 Containner 2 (HNO₃, rinse, optional for total chromium). This sample shall be analyzed in accordance with the selected procedure for total chromium analysis. At a minimum, the sample should be subjected to a digestion procedure sufficient to solubilize all chromium present.

3.2.5.4.2 Containner 3 (Silica Gel). Weigh the spent silica gel to the nearest 0.5 g using a balance. (This step may be conducted in the field.)

3.2.5.5 Sample analysis. The Cr⁺⁺ content of the sample filtrate is determined by ion chromatography coupled with a post-column reactor (IC/PCR). To increase sensitivity for trace levels of chromium, a preconcentration system is also used in conjunction with the IC/PCR.

Prior to preconcentration and/or analysis, all field samples will be filtered through a 0.45-μ filter. This filtration should be conducted just prior to sample injection/analysis.

The preconcentration is accomplished by selectively retaining the analyte on a solid absorbent (as described in 3.2.3.4.3), followed by removal of the analyte from the absorbent. The sample is injected into a sample loop of the desired size (repeated loadings or larger size loop for greater sensitivity) and the Cr⁺⁺ is collected on the resin bed of the column. When the injection valve is switched, the eluent displaces the concentrated Cr⁺⁺ sample moving it off the preconcentration column and onto the IC anion separation column. After separation from other sample components, Cr⁺⁺ forms a specific complex in the post-column reactor with a diphenylcarbazide reaction solution, and the complex is then detected by visible absorbance at a wavelength of 620 nm. The amount of absorbance measured is proportional to the concentration of the Cr⁺⁺ complex formed. The IC retention time and absorbance of the Cr⁺⁺ complex is compared with known Cr⁺⁺ standards analyzed under identical conditions to provide both qualitative and quantitative analyses.

Prior to sample analysis, establish a stable baseline with the detector set at the required attenuation by setting the eluent flowrate at approximately 1 ml/min and post-column reagent flowrate at approximately 0.5 ml/min.

NOTE: As long as the ratio of eluent flowrate to PCR flowrate remains constant, the standard curve should remain linear. Inject a sample of DI water to ensure that no Cr⁺⁺ appears in the water blank.

First, inject the calibration standards prepared, as described in section 3.2.4.4, to cover the appropriate concentration range, starting with the lowest standard first. Next,

inject, in duplicate, the performance audit sample, followed by the 0.1 N KOH field blank and the field samples. Finally, repeat the injection of the calibration standards to allow for compensation of instrument drift. Measure areas or heights of the Cr⁺⁺/DPC complex chromatogram peak. The response for replicate, consecutive injections of samples must be within 5 percent of the average response, or the injection should be repeated until the 5 percent criterion can be met. Use the average response (peak areas or heights) from the duplicate injections of calibration standards to generate a linear calibration curve. From the calibration curve, determine the concentration of the field samples employing the average response from the duplicate injections.

The results for the analysis of the performance audit sample must be within 10 percent of the reference value for the field sample analysis to be valid.

3.2.6 Calibration. Maintain a written log of all calibration activities.

3.2.6.1 Sample Train Calibration. Calibrate the sample train components according to the indicated sections of method 5: Probe Nozzle (section 5.1); Pitot Tube (section 5.2); Metering System (section 5.3); Temperature Gauges (section 5.5); Leak-Check of the Metering System (section 5.6); and Barometer (section 5.7).

3.2.6.2 Calibration Curve for the IC/PCR. Prepare working standards from the stock solution described in section 3.2.4.4.4 by dilution with a DI water solution to approximate the field sample matrix. Prepare at least four standards to cover one order of magnitude that bracket the field sample concentrations. Run the standards with the field samples as described in section 3.2.5.5. For each standard, determine the peak areas (recommended) or the peak heights, calculate the average response from the duplicate injections, and plot the average response against the Cr⁺⁺ concentration in μg/L. The individual responses for each calibration standard determined before and after field sample analysis must be within 5 percent of the average response for the analysis to be valid. If the 5 percent criteria is exceeded, excessive drift and/or instrument degradation may have occurred, and must be corrected before further analyses are performed.

Employing linear regression, calculate a predicted value for each calibration standard with the average response for the duplicate injections. Each predicted value must be within 7 percent of the actual value for the calibration curve to be considered acceptable. If not acceptable, remake and/or rerun the calibration standards. If the calibration curve is still unacceptable, reduce the range of the curve.

Additionally, the following subsections identify allowable train configuration modifications.

3.3.1.4.1.3 Basic operating and maintenance procedures for the sampling train are also described in Reference 2. As correct usage is important in obtaining valid results, all users should refer to Reference 2 and adopt the operating and maintenance procedures outlined therein unless otherwise specified. The sampling train consists of the components detailed below.

3.3.1.4.1.3.1 Probe nozzle. Glass with sharp, tapered (30° angle) leading edge. The taper shall be on the outside to preserve a constant I.D. The nozzle shall be buttonhook or elbow design. The nozzle should be coupled to the probe liner using a Teflon union. It is recommended that a stainless steel nut be used on this union. In cases where the stack temperature exceeds 210 °C (410 °F), a one-piece glass nozzle/liner assembly must be used. A range of nozzle sizes suitable for isokinetic sampling should be available. Each nozzle shall be calibrated according to the procedures outlined in EPA Method 5 (see References 1 and 2).

3.3.1.4.1.3.2 Probe liner. Borosilicate or quartz-glass tubing with a heated system capable of maintaining a gas temperature of 120 ± 14 °C (248 ± 25 °F) at the exit end during sampling. Because the actual temperature at the outlet of the probe is not usually monitored during sampling, probes constructed and calibrated according to the procedure in Reference 2 are considered acceptable. Either borosilicate or quartz-glass probe liners may be used for stack temperatures up to about 480 °C (900 °F). Quartz liners shall be used for temperatures between 480 and 900 °C (900 and 1650 °F). The softening temperature for borosilicate is 820 °C (1508 °F), and for quartz is 1500 °C (2732 °F). Water-cooling of the stainless steel sheath will be necessary at temperatures approaching and exceeding 500 °C.

3.3.1.4.1.3.3 Pitot tube. Type S, as described in section 2.1 of EPA Method 2 (Reference 1). The pitot tube shall be attached to the probe to allow constant monitoring of the stack-gas velocity. The impact (high-pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see section 3.1.1 of Reference 2) during sampling. The Type S pitot tube assembly shall have a known coefficient, determined as outlined in section 3.1.1 of Reference 2.

3.3.1.4.1.3.4 Differential pressure gauge. Inclined manometer or equivalent device as described in section 2.2 of EPA Method 2 (Reference 1). One manometer shall be used for velocity-head (delta P) readings and the other for orifice differential pressure (delta H) readings.

3.3.1.4.1.3.5 Cyclone (optional). Glass.

3.3.1.4.1.3.6 Filter holder. Borosilicate glass, with a Teflon frit filter support and a

sealing gasket. The sealing gasket shall be constructed of Teflon or equivalent materials. The holder design shall provide a positive seal against leakage at any point along the filter circumference. The holder shall be attached immediately to the outlet of the cyclone.

3.3.1.4.1.3.7 Filter heating system. Any heating system capable of maintaining a temperature of 120 ± 14 °C (248 ± 25 °F) around the filter and cyclone during sampling. A temperature gauge capable of measuring temperature to within 3 °C (5.4 °F) shall be installed so that the temperature around the filter holder can be regulated and monitored during sampling.

3.3.1.4.1.3.8 Impinger train. The following system shall be used to determine the stack gas moisture content and to collect HCl and Cl₂: five or six impingers connected in series with leak-free ground glass fittings or any similar leak-free non-contaminating fittings. The first impinger shown in Figure 1 (knockout or condensate impinger) is optional and is recommended as a water knockout trap for use under test conditions which require such a trap. If used, this impinger should be constructed as described below for the alkaline impingers, but with a shortened stem, and should contain 50 ml of 0.1 N H₂SO₄. The following two impingers (acid impingers) which each contain 100 ml of 0.1 N H₂SO₄ shall be of the Greenburg-Smith design with the standard tip (see method 5, paragraph 2.1.7). The next two impingers (alkaline impingers) which each contain 100 ml of 0.1 N NaOH and the last impinger (containing silica gel) shall be of the Greenburg-Smith design modified by replacing the tip with a 1.3 cm (½-in) I.D. glass tube extending about 1.3 cm (½ in) from the bottom of the impinger (see method 5, paragraph 2.1.7). The condensate, acid, and alkaline impingers shall contain known quantities of the appropriate absorbing reagents. The last impinger shall contain a known weight of silica gel or equivalent desiccant.

3.3.1.4.1.3.9 Metering system. The necessary components are a vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 3 °C (5.4 °F), dry-gas meter capable of measuring volume to within 1 percent, an orifice meter, (rate meter), and related equipment, as shown in Figure 1. At a minimum, the pump should be capable of 4 cfm free flow, and the dry-gas meter should have a recording capacity of 0-999.9 cu ft with a resolution of 0.005 cu ft. Other metering systems capable of maintaining sampling rates within 10 percent of isokineticity and of determining sample volumes to within 2 percent may be used. The metering system should be used in conjunction with a pitot tube to enable checks of isokinetic sampling rates.

3.3.1.4.1.3.10 Barometer. Mercury, aneroid, or other barometer capable of measuring at-

mospheric 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) is requested and an adjustment for elevation differences between the weather station and sampling point is applied at a rate of minus 2.5 mm Hg (0.1 in. Hg) per 300-m (100 ft) elevation increase (vice versa for elevation decrease).

3.3.1.4.1.3.11 Gas density determination equipment. Temperature sensor and pressure gauge (as described in sections 2.3 and 2.4 of EPA method 2), and gas analyzer, if necessary (as described in EPA method 3. Reference 1). The temperature sensor ideally should be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal. Alternatively, the sensor may be attached just prior to use in the field. Note, however, that if the temperature sensor is attached in the field, the sensor must be placed in an interference-free arrangement with respect to the Type S pitot tube openings (see EPA method 2, Figure 2-7). As a second alternative, if the stack gas is saturated, the stack temperature may be measured at a single point near the center of the stack.

3.3.1.4.1.3.12 Ascarite tube for conditioning ambient air. Tube tightly packed with approximately 150 g of fresh 8 to 20 mesh Ascarite II® sodium hydroxide coated silica, or equivalent, to dry and remove acid gases from the ambient air used to remove moisture from the filter and optional cyclone. The inlet and outlet ends of the tube should be packed with at least 1 cm thickness of glass wool or filter material suitable to prevent escape of Ascarite II fines. Fit one end with flexible tubing, etc. to allow connection to probe nozzle.

3.3.1.4.2 Sample Recovery.

3.3.1.4.2.1 Probe liner. Probe and nozzle brushes; nylon bristle brushes with stainless steel wire handles are required. The probe brush shall have extensions of stainless steel, Teflon, or inert material at least as long as the probe. The brushes shall be properly sized and shaped to brush out the probe liner and the probe nozzle.

3.3.1.4.2.2 Wash bottles. Two. Polyethylene or glass, 500 ml or larger.

3.3.1.4.2.3 Glass sample storage containers. Glass, 500- or 1000-ml. Screw-cap liners shall be Teflon and constructed so as to be leak-free. Narrow-mouth glass bottles have been found to exhibit less tendency toward leakage.

3.3.1.4.2.4 Petri dishes. Glass or plastic, sealed around the circumference with Teflon tape, for storage and transport of filter samples.

3.3.1.4.2.5 Graduated cylinder and/or balances. To measure condensed water to the nearest 1 ml or 1 g. Graduated cylinders shall have subdivisions not >2 ml. Laboratory tri-ple-beam balances capable of weighing to ± 0.5 g or better are required.

3.3.1.4.2.6 Plastic storage containers. Screw-cap polypropylene or polyethylene containers to store silica gel.

3.3.1.4.2.7 Funnel and rubber policeman. To aid in transfer of silica gel to container (not necessary if silica gel is weighed in field).

3.3.1.4.2.8 Funnel. Glass, to aid in sample recovery.

3.3.1.5 Reagents

3.3.1.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently higher purity to permit its use without lessening the accuracy of the determination.

3.3.1.5.2 ASTM Type II water (ASTM D1193-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.1.5.3 Sulfuric acid (0.1 N), H₂SO₄. Used as the HCl absorbing reagent in the impinger train. To prepare 1 L, slowly add 2.80 ml of concentrated H₂SO₄ to about 900 ml of water while stirring, and adjust the final volume to 1 L using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.1.5.4 Sodium hydroxide (0.1 N), NaOH. Used as the Cl₂ absorbing reagent in the impinger train. To prepare 1 L, dissolve 4.00 g of solid NaOH in about 900 ml of water and adjust the final volume of 1 L using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank values obtained during the field sample analysis must be less than 10 percent of the sample values (see Method 9057).

3.3.1.5.5 Filter. Quartz-fiber or Teflon mat (e.g., Pallflex® TX-40H45) filter.

3.3.1.5.6 Silica gel. Indicating type, 6-16 mesh. If previously used, dry at 175 °C (350 °F) for 2 hours before using. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better)

may be used, subject to the approval of the Administrator.

3.3.1.5.7 Acetone. When using this train for determination of particulate emissions, reagent grade acetone, <0.001 percent residue, in glass bottles is required. Acetone from metal containers generally has a high residue blank and should not be used. Sometimes suppliers transfer acetone to glass bottles from metal containers; thus, acetone blanks shall be run prior to field use and only acetone with low blank values (<0.001 percent) shall be used. In no case shall a blank value greater than 0.001 percent of the weight of acetone used be subtracted from the sample weight.

3.3.1.5.8 Crushed ice. Quantities ranging from 10-50 lbs may be necessary during a sampling run, depending on ambient air temperature.

3.3.1.5.9 Stopcock grease. Acetone-insoluble, heat-stable silicone grease may be used, if needed. Silicone grease usage is not necessary if screw-on connectors or Teflon sleeves on ground-glass joints are used.

3.3.1.6 Sample Collection, Preservation, and Handling.

3.3.1.6.1 Sample collection is described in this method. The analytical procedures for HCl and Cl₂ are described in method 9057 and for particulate matter in EPA method 5 (Reference 1).

3.3.1.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.1.7 Procedure.

3.3.1.7.1 Preparation for Field Test.

3.3.1.7.1.1 All sampling equipment shall be maintained and calibrated according to the procedures described in section 3.4.2 of EPA's Quality Assurance Handbook, Volume III (Reference 2).

3.3.1.7.1.2 Weigh several 200- to 300-g portions of silica gel in airtight containers to the nearest 0.5 g. Record on each container the total weight of the silica gel plus containers. As an alternative to preweighing the silica gel, it may instead be weighed directly in the impinger just prior to train assembly.

3.3.1.7.1.3 Check filters visually against light for irregularities and flaws or pinholes. Label the shipping containers (glass or plastic Petri dishes) and keep the filters in these containers at all times except during sampling (and weighing for particulate analysis).

3.3.1.7.1.4 If a particulate determination will be conducted, desiccate the filters at 20 ± 3.6°C (68 ± 10°F) and ambient pressure for at least 24 hours, and weigh at intervals of at least 6 hours to a constant weight (i.e., <0.5-mg change from previous weighing), recording each weighing, the filter must not be exposed for more than a 2-min period to the laboratory atmosphere and relative humidity

above 50 percent. Alternatively (unless otherwise specified by the Administrator), the filters may be oven-dried at 105°C (220°F) for 2-3 hours, desiccated for 2 hours, and weighed.

3.3.1.7.2 Preliminary Field Determinations.

3.3.1.7.2.1 Select the sampling site and the minimum number of sampling points according to EPA method 1 or as specified by the Administrator. Determine the stack pressure, temperature, and range of velocity heads using EPA method 2. It is recommended that a leak-check of the plot lines (see EPA method 2, section 3.1) be performed. Determine the stack-gas moisture content using EPA method 4 or its alternatives to establish estimates of isokinetic sampling rate settings. Determine the stack gas dry molecular weight, as described in EPA method 2, section 3.6. If integrated EPA method 3 (Reference 1) sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as the sample run.

3.3.1.7.2.2 Select a nozzle size based on the range of velocity heads so that it is not necessary to change the nozzle size to maintain isokinetic sampling rates. During the run, do not change the nozzle. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see section 2.2 of EPA method 2).

3.3.1.7.2.3 Select a suitable probe liner and probe length so that all traverse points can be sampled. For large stacks, to reduce the length of the probe, consider sampling from opposite sides of the stack.

3.3.1.7.2.4 The total sampling time should be two hours. Allocate the same time to all traverse points defined by EPA method 1. To avoid timekeeping errors, the length of time sampled at each traverse point should be an integer or an integer plus one-half min. Size the condensate impinger for the expected moisture catch or be prepared to empty it during the run.

3.3.1.7.3 Preparation of Sampling Train.

3.3.1.7.3.1 Add 50 ml of 0.1 N H₂SO₄ to the condensate impinger; if used. Place 100 ml of 0.1 N H₂SO₄ in each of the next two impingers. Place 100 ml of 0.1 N NaOH in each of the following two impingers. Finally, transfer approximately 200-300 g of preweighed silica gel from its container to the last impinger. More silica gel may be used, but care should be taken to ensure that it is not entrained and carried out from the impinger during sampling. Place the silica gel container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

3.3.1.7.3.2 Using a tweezer or clean disposable surgical gloves, place a labeled (identified) filter (weighed, if particulate matter to

be determined) in the filter holder. Be sure that the filter is properly centered and the gasket properly placed to prevent the sample gas stream from circumventing the filter. Check the filter for tears after assembly is completed.

3.3.1.7.3.3 To use glass liners, install the selected nozzle using a Viton-A O-ring when stack temperatures are <260°C (500°F) and a woven glass-fiber gasket when temperatures are higher. Other connecting systems utilizing either 316 stainless steel or Teflon ferrules may be used. Mark the probe with heat-resistant tape or by some other method to denote the proper distance into the stack or duct for each sampling point.

3.3.1.7.3.4 Set up the train as in Figure 3.3-1. A minimal amount of silicone grease may be used on ground glass joints. Connect temperature sensors to the appropriate potentiometer/display unit. Check all temperature sensors at ambient temperature.

3.3.1.7.3.5 Place crushed ice around the impingers.

3.3.1.7.3.6 Turn on and set the filter and probe heating systems at the desired operating temperatures. Allow time for the temperatures to stabilize.

3.3.1.7.4 Leak-Check Procedures.

3.3.1.7.4.1 Pretest leak-check. A pretest leak-check is recommended, but not required. If the tester opts to conduct the pretest leak-check, the following procedure shall be used.

3.3.1.7.4.1.1 If a Viton-A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak-check the train at the sampling site by plugging the nozzle and pulling a 380-mm Hg (15-in. Hg) vacuum.

NOTE: A lower vacuum may be used, provided that it is not exceeded during the test.

3.3.1.7.4.1.2 If a woven glass-fiber gasket is used, do not connect the probe to the train during the leak-check. Instead, leak-check the train by first plugging the inlet to the cyclone, if used, or the filter holder and pulling a 380-mm Hg (15-in. Hg) vacuum (see Note above). Then, connect the probe to the train and leak-check at about 25-mm Hg (1-in. Hg) vacuum; alternatively, leak-check the probe with the rest of the sampling train in one step at 380-mm Hg (15-in. Hg) vacuum. Leakage rates in excess of 4 percent of the average sampling rate or 0.0057 m³/min (0.02 cfm), whichever is less, are unacceptable.

3.3.1.7.4.1.3 The following leak-check instructions for the sampling train may be helpful. Start the pump with bypass valve fully open and coarse adjust valve completely closed. Partially open the coarse adjust valve and slowly close the bypass valve until the desired vacuum is reached. Do not reverse direction of the bypass valve; this will cause water to back up into the filter holder. If the desired volume is exceeded, el-

ther leak-check at this higher vacuum or end the leak-check, as shown below, and start over.

3.3.1.7.4.1.4 When the leak-check is completed, first slowly remove the plug from the inlet to the probe, cyclone, or filter holder and immediately turn off the vacuum pump. This prevents the liquid in the impingers from being forced backward into the filter holder and silica gel from being entrained backward into the fifth impinger.

3.3.1.7.4.2 Leak-checks during sample run. If during the sampling run, a component (e.g., filter assembly or impinger) change becomes necessary or a port change is conducted, a leak-check shall be conducted immediately after the interruption of sampling and before the change is made. The leak-check shall be conducted according to the procedure outlined in Section 3.3.1.7.4.1, except that it shall be conducted at a vacuum greater than or equal to the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.0057 m³/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester shall void the sampling run. Immediately after a component change or port change, and before sampling is reintiated, another leak-check similar to a pre-test leak-check is recommended.

3.3.1.7.4.3 Post-test leak-check. A leak-check is mandatory at the conclusion of each sampling run. The leak-check shall be done using the same procedures as those with the pre-test leak-check, except that it shall be conducted at a vacuum greater than or equal to the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.0057 m³/min (0.02 cfm) or 4 percent of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester shall void the sampling run.

3.3.1.7.5 Train Operation.

3.3.1.7.5.1 During the sampling run, maintain an isokinetic sampling rate to within 10 percent of true isokinetic, unless otherwise specified by the Administrator. Maintain a temperature around the filter (and cyclone, if used) of 120±14°C (248±25°F).

3.3.1.7.5.2 For each run, record the data required on a data sheet such as the one shown in Figure 3.3-2. Be sure to record the initial dry gas meter reading. Record the dry gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made before and after each leak-check, and when sampling is halted. Take other readings required by Figure 3.3-2 at least once at each sample point during each time increment and additional readings when significant changes (20 percent variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because

3.3.1.7.5.6 Traverse the stack cross section, as required by EPA Method 1 or as specified by the Administrator, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the access port, in order to minimize the chance of extracting deposited material.

3.3.1.7.5.7 During the test run, make periodic adjustments to keep the temperature around the filter holder (and cyclone, if used) at the proper level. Add more ice, and, if necessary, salt to maintain a temperature of $<20^{\circ}\text{C}$ (68°F) at the condenser/silica gel outlet. Also, periodically check the level and zero of the manometer.

3.3.1.7.5.8 If the pressure drop across the filter becomes too high, making isokinetic sampling difficult to maintain, it may be replaced in the midst of a sample run. Using another complete filter holder assembly is recommended, rather than attempting to change the filter itself. After a new filter assembly is installed, conduct a leak-check. If determined, the total particulate weight shall include the summation of all filter assembly leak-checks.

3.3.1.7.5.9 If the condensate impinger becomes too full, it may be emptied, recharged with 50 ml of 0.1 N H_2SO_4 , and replaced during the sample run. The condensate emptied must be saved and included in the measurement of the volume of moisture collected and included in the sample for analysis. The additional 50 ml of absorbing reagent must also be considered in calculating the moisture. After the impinger is reinstalled in the train, conduct a leak-check.

3.3.1.7.5.10 A single train shall be used for the entire sample run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or in cases where equipment failure necessitates a change of trains. In all other situations, the use of two or more trains will be subject to the approval of the Administrator.

3.3.1.7.5.11 Note that when two or more trains are used, separate analyses of the particulate catch (if applicable) and the HCl and Cl_2 impinger catches from each train shall be performed, unless identical nozzle sizes were used on all trains. In that case, the particulate catch and the HCl and Cl_2 impinger catches from the individual trains may be combined, and a single particulate analysis and single HCl and Cl_2 analyses of the impinger contents may be performed.

3.3.1.7.5.12 At the end of the sample run, turn off the coarse adjust valve, remove the probe and nozzle from the stack, turn off the pump, and record the final dry gas meter reading.

3.3.1.7.5.13 If there is any possibility that liquid has collected in the glass cyclone and/or on the filter, connect the Ascarite tube at the probe inlet and operate the train with

the filter heating system at $120\pm14^{\circ}\text{C}$ ($248\pm25^{\circ}\text{F}$) at a low flow rate (e.g., $\text{H}=\text{T}$) sufficient to vaporize the liquid and any HCl in the cyclone or on the filter and pull it through the train into the impingers. After 30 minutes, turn off the flow, remove the Ascarite tube, and examine the cyclone and filter for any visible moisture. If moisture is visible, repeat this step for 15 minutes.

3.3.1.7.5.14 Conduct a post-test leak check. Also, leak-check the pilot lines as described in EPA method 2. The lines must pass this leak-check in order to validate the velocity-head data.

3.3.1.7.5.15 If the moisture value is available, calculate percent isokineticity (see section 3.3.1.7.7.10) to determine whether the run was valid or another test run should be conducted.

3.3.1.7.6 Sample Recovery.

3.3.1.7.6.1 Allow the probe to cool. When the probe can be handled safely, wipe off all the external surfaces of the tip of the probe nozzle and place a cap over the tip. Do not cap the probe tip tightly while the sampling train is cooling down because this will create a vacuum in the filter holder, drawing water from the impingers into the holder.

3.3.1.7.6.2 Before moving the sampling train to the cleanup site, remove the probe, wipe off any silicone grease, and cap the open outlet, being careful not to lose any condensate that might be present. Wipe off any silicone grease and cap the filter or cyclone inlet. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger and the filter holder, disconnect it at the filter holder and let any condensed water drain into the first impinger. Wipe off any silicone grease and cap the filter holder outlet and the impinger inlet. Ground glass stoppers, plastic caps, serum caps, Teflon tape, Parafilm[®], or aluminum foil may be used to close these openings.

3.3.1.7.6.3 Transfer the probe and filter/impinger assembly to the cleanup area. This area should be clean and protected from the weather to minimize sample contamination or loss.

3.3.1.7.6.4 Save portions of all washing solutions used for cleanup (acetone and Type II water) and the absorbing reagents (0.1 N H_2SO_4 and 0.1 N NaOH) as blanks. Transfer 200 ml of each solution directly from the wash bottle being used (rinse solutions) or the supply container (absorbing reagents) and place each in a separate, prelabeled glass sample container.

3.3.1.7.6.5 Inspect the train prior to and during disassembly and note any abnormal conditions.

3.3.1.7.6.6 Container No. 1 (filter catch for particulate determination). Carefully remove the filter from the filter holder and place it in its identified Petri dish container. Use one or more pair of tweezers to handle

the filter. If it is necessary to fold the filter, ensure that the particulate cake is inside the fold. Carefully transfer to the Petri dish any particulate matter or filter fibers that adhere to the filter holder gasket, using a dry nylon bristle brush or sharp-edged blade, or both. Label the container and seal with Teflon tape around the circumference of the lid. 3.3.1.7.6.7 Container No. 2 (front-half rinses for particulate determination). Taking care that dust on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate material or any condensate from the probe nozzle, probe fitting, probe liner, and front half of the filter holder by washing these components with acetone into a glass container. Retain an acetone blank and analyze with the samples.

3.3.1.7.6.8 Perform rinses as follows: Carefully remove the probe nozzle and clean the inside surface by rinsing with acetone from a wash bottle and brushing with a nylon bristle brush. Brush until the rinse shows no visible particles; then make a final rinse of the inside surface with the acetone. Brush and rinse the inside parts of the Swagelok fitting with the acetone in a similar way until no visible particles remain.

3.3.1.7.6.9 Have two people rinse the probe liner with acetone by tilting and rotating the probe while squirting acetone into its upper end so that all inside surfaces will be wetted with solvent. Let the acetone drain from the lower end into the sample container. A glass funnel may be used to aid in transferring liquid washed to the container.

3.3.1.7.6.10 Follow the acetone rinses with a probe brush. Hold the probe in an inclined position and squirt acetone into the upper end while pushing the probe brush through the probe with a twisting action; place a sample container underneath the lower end of the probe and catch any acetone and particulate matter that is brushed from the probe. Run the brush through the particulate matter three or more times until no visible particulate matter is carried out with the acetone or until none remains in the probe liner on visual inspection. Rinse the brush with acetone and quantitatively collect these washings in the sample container. After the brushing, make a final acetone rinse of the probe as described above. Between sampling runs, keep brushes clean and protected from contamination.

3.3.1.7.6.11 Clean the inside of the front half of the filter holder and cyclone by rubbing the surfaces with a nylon bristle brush and rinsing with acetone. Rinse each surface three times, or more if needed, to remove visible particulate. Make a final rinse of the brush and filter holder. Carefully rinse out the glass cyclone and cyclone flask (if applicable). Brush and rinse any particulate material adhering to the inner surfaces of these components into the front-half rinse sample.

After all rinses and particulate matter have been collected in the sample container, tighten the lid on the sample container so that acetone will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Label the container to identify its contents.

3.3.1.7.6.12 Container No. 3 (knockout and acid impinger catch for moisture and HCl determination). Disconnect the impingers. Measure the liquid in the acid and knockout impingers to within ± 1 ml by using a graduated cylinder or by weighing it to within ± 0.5 g by using a balance (if one is available). Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these impingers, connecting glassware (and tubing, if used); and the back half of the filter holder with water and add these rinses to the storage container. Seal the container, shake to mix, and label. The fluid level should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Retain rinse water and acidic absorbing solution blanks and analyze with the samples.

3.3.1.7.6.13 Container No. 4 (alkaline impinger catch for Cl_2 and moisture determination). Measure and record the liquid in the alkaline impingers as described in section 3.3.1.7.6.12. Quantitatively transfer this liquid to a leak-free sample storage container. Rinse these two impingers and connecting glassware with water and add these rinses to the container. Seal the container, shake to mix, and label; mark the fluid level. Retain alkaline absorbing solution blank and analyze with the samples.

3.3.1.7.6.14 Container No. 5 (silica gel for moisture determination). Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the last impinger to its original container and seal. A funnel may make it easier to pour the silica gel without spilling. A rubber policeman may be used as an aid in removing the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere strongly to the impinger wall. Because the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, weigh the container and its contents to 0.5 g or better.

3.3.1.7.6.15 Prior to shipment, recheck all sample containers to ensure that the caps are well secured. Seal the lids of all containers around the circumference with Teflon tape. Ship all liquid samples upright and all particulate filters with the particulate catch facing upward.

3.3.1.7.7 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.1.7.1 Nomenclature.

A_n =Cross-sectional area of nozzle, m^2 (ft^2).

B_w =Water vapor in the gas stream, proportion by volume.

C_p =Acetone blank residue concentration, mg/l .

C_p =Type S pitot tube coefficient (nominally 0.94 $\pm$ 0.02), dimensionless.

C_p =Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, $g/dscf$.

I =Percent of isokinetic sampling.

m_p =Mass of residue of acetone after evaporation, mg .

M_p =Total amount of particulate matter collected, mg .

M_p =Stack-gas dry molecular weight, g/g -mole (lb/lb-mole).

M_w =Molecular weight of water, 18.0 g/g -mole (18.0 lb/lb-mole).

P_{ws} =Barometric pressure at the sampling site, mm Hg (in. Hg).

P_s =Absolute stack-gas pressure, ms Hg (in. Hg).

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

R =Ideal gas constant, 0.08206 mm Hg- m^3 (K-g-mole (21.85 in. Hg-ft³/R-lb-mole).

T_m =Absolute average dry-gas meter temperature (see Figure 2), $^{\circ}K$ ($^{\circ}R$).

T_s =Absolute average stack-gas temperature (see Figure 2), $^{\circ}K$ ($^{\circ}R$).

T_{ws} =Standard absolute temperature, 293 $^{\circ}K$ (528 $^{\circ}R$).

V_t =Total volume of liquid collected in the impingers and silica gel, ml .

V_m =Volume of gas sample is measured by dry-gas meter, $dscm$ ($dscf$).

V_{mws} =Volume of gas sample measured by the dry-gas meter, corrected to standard conditions, $dscm$ ($dscf$).

V_{mws} =Volume of water vapor in the gas sample, corrected to standard conditions, $dscm$ ($dscf$).

V_s =Stack-gas velocity, calculated by Method 2, Equation 2-9, using data obtained from Method 5, m/sec (ft/sec).

W_p =Weight of residue in acetone wash, mg .

V_p =Volume of acetone blank, ml .

V_m =Volume of acetone used in wash, ml .

Y =Dry-gas-meter calibration factor, dimensionless.

ΔH =Average pressure differential across the orifice meter, mm H₂O (in H₂O).

ρ_p =Density of acetone, mg/ml (see label on bottle).

ρ_w =Density of water, 0.9982 g/ml (0.002201 lb/ml).

ϕ =Total sampling time, min .

ΔG =Specific gravity of mercury.

ϕ =Sec/min.

$\%$ =Conversion to percent.

3.3.1.7.2 Average dry gas meter temperature and average orifice pressure drop. See data sheet (Figure 3.3-2).

3.3.1.7.3 Dry gas volume. Correct the sample measured by the dry gas meter to standard conditions (20 $^{\circ}C$, 760 mm Hg (60 $^{\circ}F$, 29.92 in. Hg)) by using Equation 1:

$$V_{mws} = V_m Y \frac{T_m}{T_s} \frac{P_{ws}}{P_s} \quad (1)$$

$$= K_1 V_m Y \frac{P_{ws}}{P_s}$$

where:

K_1 =0.3658 K/ mm Hg for metric units, or

K_1 =17.64 R/in. Hg for English units.

3.3.1.7.4 Volume of water vapor.

$$V_{mws} = V_t \frac{P_{ws}}{M_w} \frac{RT_{ws}}{P_{ws}} = K_2 V_t \quad (2)$$

where:

K_2 =0.001333 m^3/ml for metric units, or

K_2 =0.04707 m^3/ml for English units.

3.3.1.7.5 Moisture content.

$$B_w = \frac{V_{mws}}{V_{mws} + V_{mws}} \quad (3)$$

NOTE: In saturated or water-droplet-laden gas streams, two calculations of the moisture content of the stack gas shall be made, one from the impinger analysis (Equation 3) and a second from the assumption of saturated conditions. The lower of the two values of B_w shall be considered correct. The procedure for determining the moisture content based upon assumption of saturated conditions is given in the Note to section 1.2 of Method 4. For the purposes of this method, the average stack gas temperature from Figure 2 may be used to make this determination, provided that the accuracy of the in-stack temperature sensor is $\pm 1^{\circ}C$ ($2^{\circ}F$).

3.3.1.7.6 Acetone blank concentration. For particulate determination.

$$C_p = \frac{m_p}{V_p \rho_p} \quad (4)$$

3.3.1.7.7 Acetone wash blank. For particulate determination.

$$W_p = C_p V_{mws} \quad (5)$$

3.3.1.7.8 Total particulate weight. Determine the total particulate catch from the sum of the weights obtained from Container Nos. 1 and 2 less the acetone blank (W_p).

3.3.1.7.9 Particulate concentration. C_p =0.001 g/mg (m^3/V_{mws}) (6)

3.3.1.7.10 Isokinetic variation.

3.3.1.7.10.1 Calculation from raw data.

$$I = \frac{100 T_s [K_3 P_{ws} + (V_m / T_m Y P_{ws} + H/13.6)]}{60.0 V_p P_{ws}} \quad (7)$$

where:

K_3 =0.003454 mm Hg- m^3/ml -K for metric units, or

K_3 =0.002669 in. Hg-ft³/ml $^{\circ}R$ for English units.

3.3.1.7.10.2 Calculation for intermediate values.

$$I = \frac{T_s V_{mws} P_{ws}}{T_{ws} V_p A_n P_{ws} (1 - B_w)} \quad (8)$$

$$= K_4 \frac{T_s V_{mws}}{P_{ws} V_p A_n (1 - B_w)}$$

where:

K_4 =4.320 for metric units, or

K_4 =0.09450 for English units.

3.3.1.7.10.3 Acceptable units. If 90 percent $\pm$ 10 percent, the results are acceptable. If the results are low in comparison with the standard and I is beyond the acceptable range, or if I is less than 90 percent, the Administrator may opt to accept the results.

3.3.1.8 Quality Control.

3.3.1.8.1 Sampling. See EPA Manual 6004-77-027b for Method 5 quality control.

3.3.1.8.2 Analysis. At the present time, a validated audit material does not exist for this method. Analytical quality control procedures are detailed in Method 9057.

3.3.1.9 Method Performance.

3.3.1.9.1 The in-stack detection limit for the method is approximately 0.02 μg of HCl per liter of stack gas. The method has a negative bias below 20 ppm HCl (Reference 6).

3.3.1.9.2 It is preferable to include the cyclone in the sampling train to protect the filter from any moisture present. There is research in progress regarding the necessity of the cyclone at low moisture sources and the use of Ascarite II in the drying procedure (Section 3.3.1.7.5.12).

References

1. U.S. Environmental Protection Agency, 40 CFR part 60, appendix A, Methods 1-6.
2. U.S. Environmental Protection Agency, "Quality Assurance Handbook for Air Pollution Measurement Systems, Volume III, Stationary Source Specific Methods," Publication No. EPA-600/4-77-027b, August 1977.
3. Shigehara, R.T., Adjustments in the EPA Nomography for Different Pitot Tube Coefficients and Dry Molecular Weights, Stack Sampling News, 2:4-11 (October 1974).
4. Steineberger, S.C. and J.H. Margeeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA 600/3-88/064, NTIS PB89 220696-AS.
5. State of California, Air Resources Board, method 421, "Determination of Hydrochloric Acid Emissions from Stationary Sources," March 18, 1987.
6. Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride Emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-4442, Research Triangle Park, North Carolina, January 22, 1988.

3.3.2 Midget Impinger HClO₂ Emission Sampling Train (Method 0051)

3.3.2.1 Scope and Application.

3.3.2.1.1 This method describes the collection of hydrogen chloride (HCl, CAS Registry Number 7647-01-0) and chlorine (Cl₂, CAS Registry Number 7782-50-6) in stack gas emission samples from hazardous waste incinerators, municipal waste combustors, and boilers and industrial furnaces. The collected samples are analyzed using method 8057. This method is designed to collect HClO₂ in their gaseous forms. Sources, such as those controlled by wet scrubbers, that emit acid particulate matter (e.g., HCl dissolved in water droplets) must be sampled using an isokinetic HClO₂ sampling train (see Method 0050).

3.3.2.2 Summary of Method.

3.3.2.2.1 An integrated gas sample is extracted from the stack and passes through a particulate filter, acidified water, and finally through an alkaline solution. The filter serves to remove particulate matter such as

chloride salts which could potentially react and form analyte in the absorbing solutions. In the acidified water absorbing solution, the Cl^- is solubilized and forms chloride ions (Cl^-) as follows:



The Cl_2 gas present in the emissions has a very low solubility in acidified water and passes through to the alkaline absorbing solution where it undergoes hydrolysis to form a proton (H^+), Cl^- , and hypochlorous acid (HClO) as follows:



The Cl^- ions in the separate solutions are measured by ion chromatography (Method 9057).

3.3.2.3 Interferences.

3.3.2.3.1 Volatile materials which produce chloride ions upon dissolution during sampling are obvious interferences in the measurement of HCl . One interferent for HCl is diatomic chlorine (Cl_2) gas which disproportionates to HCl and hypochlorous acid (HClO) upon dissolution in water. Cl_2 gas exhibits a low solubility in water, however, and the use of acidic rather than neutral or basic solutions for collection of hydrogen chloride gas greatly reduces the dissolution of any chlorine present. Sampling a 400 ppm HCl gas stream containing 50 ppm Cl_2 with this method does not cause a significant bias. Sampling a 220 ppm HCl gas stream containing 180 ppm Cl_2 results in a positive bias of 3.4 percent in the HCl measurement.

3.3.2.3.2 Reducing agents such as SO_2 may cause a positive bias in the Cl_2 measurement by the following reaction:



3.3.2.4 Apparatus and Materials.

3.3.2.4.1 Sampling Train. The sampling train is shown in Figure 1 and component parts are discussed below.

3.3.2.4.1.1 Probe. Borosilicate glass, approximately $\frac{3}{8}$ -in (9-mm) inside diameter, with a heating system to prevent condensation. When the concentration of alkaline particulate matter in the emissions is high, a $\frac{1}{2}$ -in (9-mm) inside diameter Teflon elbow should be attached to the inlet of the probe; a 1-in (25-mm) length of Teflon tubing with a $\frac{3}{8}$ -in (9-mm) inside diameter should be attached at the open end of the elbow to permit the opening of the probe to be burned away from the gas stream, thus reducing the amount of particulate entering the train. When high concentrations of particulate matter are not present, the Teflon elbow is not necessary, and the probe inlet can be perpendicular to the gas stream. When sampling at locations where gas temperatures are greater than approximately 400°F, such as wet scrubber inlets, glass or quartz elbows must be used. In no case should a glass wool plug be used to remove particulate matter;

within 2 percent of selected flow rate of 2 liter/min.

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

3.3.2.4.1.8.5 Vacuum gauge. At least 760 mm Hg (30 in. Hg) gauge to be used for leak check of the sampling train.

3.3.2.4.2 Sample Recovery.

3.3.2.4.2.1 Wash bottles. Polyethylene or glass, 500 ml or larger, two.

3.3.2.4.2.2 Storage bottles. Glass, with Teflon-lined lids, 100 ml, to store impinger samples (two per sampling run).

3.3.2.5 Reagents.

3.3.2.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.3.2.5.2 ASTM Type II Water (ASTM D1193-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.3 Sulfuric acid (0.1 N), H_2SO_4 . Used as the HCl absorbing reagent. To prepare 100 ml, slowly add 0.28 ml of concentrated H_2SO_4 to about 90 ml of water while stirring, and adjust the final volume to 100 ml using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.4 Sodium hydroxide (0.1 N), NaOH . Used as the Cl_2 absorbing reagent. To prepare 100 ml, dissolve 0.40 g of solid NaOH in about 90 ml of water and adjust the final volume to 100 ml using additional water. Shake well to mix the solution. It is advisable to analyze a blank sample of this reagent prior to sampling, since the reagent blank value obtained during the field sample analysis must be less than 10 percent of the sample values (see method 9057).

3.3.2.5.5 Filter. Teflon mat Pallflex TX40H175 or equivalent. Locate in a glass, quartz, or Teflon filter holder with a Teflon filter support in a filter box heated to 250°F.

3.3.2.5.6 Stopcock grease. Acetone-insoluble, heat-stable silicone grease may be used, if necessary.

3.3.2.5.7 Silica gel. Indicating type, 6- to 16-mesh. 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.

3.3.2.6 Sample Collection, Preservation, and Handling.

3.3.2.6.1 Sample collection is described in this method. The analytical procedures are described in Method 9057.

3.3.2.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.2.7 Procedure.

Quality Assurance Handbook, Volume III (Reference 4) may be used as a guide for these operations.

3.3.2.7.1 Dry Gas Metering System.

3.3.2.7.1.1 Initial calibration. Before its initial use in the field, first leak check the metering system (sample line, drying tube, if used, vacuum gauge, needle valve, pump, rate meter, and dry gas meter) as follows: plug the inlet end of the sampling line, pull a vacuum of 250 mm (10 in) Hg, plug off the outlet of the dry gas meter, and turn off the pump. The vacuum should remain stable for 30 seconds. Carefully release the vacuum from the system by slowly removing the plug from the sample line inlet. Remove the sampling line (and drying tube, if applicable), and connect the dry gas metering system to an appropriately sized wet test meter (e.g., 1 liter per revolution). 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, with 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.

3.3.2.7.1.2 Post-test calibration check. After each field test series, conduct a calibration check as in section 3.3.2.7.1.1 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, (c) only two independent runs need to be made. If the calibration factor does not deviate by more than 5 percent from the initial calibration factor (determined in section 3.3.2.7.1.1), 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 section 3.3.2.7.1.1, and for

the calculations, use the calibration factor (initial or recalibration) that yields the lower gas volume for each test run.

3.3.2.7.1.2 Thermometer(s). Prior to each field test, calibrate against mercury-in-glass thermometers at ambient temperature. If the thermometer being calibrated reads within 2°C (2.6°F) of the mercury-in-glass thermometer, it is acceptable. If not, adjust the thermometer or use an appropriate correction factor.

3.3.2.7.1.3 Rate meter. The rate meter need not be calibrated, but should be cleaned and maintained according to the manufacturer's instructions.

3.3.2.7.1.4 Barometer. Prior to each field test, calibrate against a mercury barometer. The field barometer should agree within 0.1 in. Hg with the mercury barometer. If it does not, the field barometer should be adjusted.

3.3.2.7.2 Sampling.

3.3.2.7.2.1 Preparation of collection train. Prepare the sampling train as follows: The first or knockout impinger should have a shortened stem and be left empty to condense moisture in the gas stream. The next two midjet impingers should each be filled with 15 ml of 0.1 N H_2SO_4 , and the fourth and fifth impingers should each be filled with 15 ml of 0.1 N NaOH. Place a fresh charge of silica gel, or equivalent, in the Mae West impinger (or the drying tube). Connect the impingers in series with the knockout impinger first, followed by the two impingers containing the acidified reagent, the two impingers containing the alkaline reagent, and the Mae West impinger containing the silica gel. If the moisture will be determined, weigh the impinger assembly to the nearest 0.5 g and record the weight.

3.3.2.7.2.2 Leak check procedures. Leak check the probe and three-way stopcock prior to inserting the probe into the stack. Connect the stopcock to the outlet of the probe, and connect the sample line to the needle valve. Plug the probe inlet, turn on the sample pump, and pull a vacuum of at least 250 mm Hg (10 in. Hg). Turn off the needle valve, and note the vacuum gauge reading. The vacuum should remain stable for at least 30 seconds. Place the probe in the stack at the sampling location, and adjust the filter heating system to 250°F and the probe and stopcock heating systems to a temperature sufficient to prevent water condensation. Connect the first impinger to the stopcock, and connect the sample line to the last impinger and the needle valve. Upon completion of a sampling run, remove the probe from the stack and leak check as described above. If a leak has occurred, the sampling run must be voided. Alternatively, the portion of the train behind the probe may be leak checked between multiple runs at the same site as follows: Close the stopcock to the first impinger (see Figure 3.3-3A), and turn on the sample pump. Pull a vacuum of at least 250 mm Hg (10 in. Hg), turn off the needle valve, and note the vacuum gauge reading. The vacuum should remain stable for at least 30 seconds. Release the vacuum on the impinger train by turning the stopcock to the vent position to permit ambient air to enter (see Figure 3.3-3B). If this procedure is used, the full train leak check described above must be conducted following the final run and all preceding sampling runs voided if a leak has occurred.

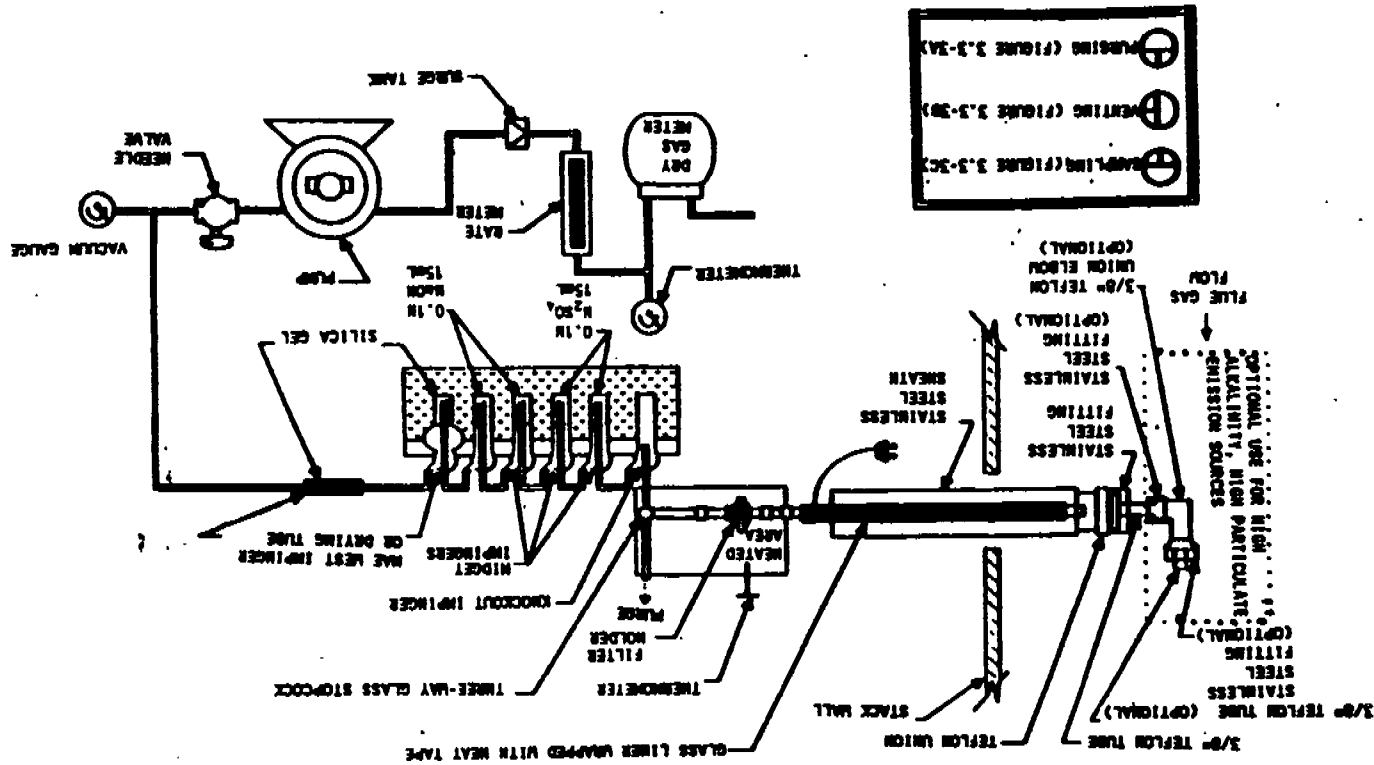


Figure 3.3-3 Midjet Impinger HCl/Cl₂ Sampling Train

3.3.2.7.2.3 Purge procedure. Immediately prior to sampling connect the purge line to the stopcock and turn the stopcock to permit the purge pump to purge the probe (see Figure 3.3-3A). Turn on the purge pump, and adjust the purge rate to 2 liter/min. Purge for at least 5 minutes prior to sampling.

3.3.2.7.2.4 Sample collection. Turn on sample pump, pull a slight vacuum of approximately 25 mm Hg (1 in. Hg) on the impinger train, and turn the stopcock to permit stack gas to be pulled through the impinger train (see Figure 3.3-3C). Adjust the sampling rate to 2 liter/min, as indicated by the rate meter, and maintain this rate within 10 percent during the entire sampling run. Take readings of the dry gas meter, the dry gas meter temperature, rate meter, and vacuum gauge at least once every five minutes during the run. A sampling time of one hour is recommended. However, if the expected condensate catch for this sampling run duration will exceed the capacity of the sampling train, (1) a larger knockout impinger may be used or (2) two sequential half-hour runs may be conducted. At the conclusion of the sampling run, remove the train from the stack, cool, and perform a leak check as described in section 3.3.2.7.2.2.

3.3.2.7.3 Sample recovery. Following sampling, disconnect the impinger train from the remaining sampling equipment at the inlet to the knockout impinger and the outlet to the last impinger. If performing a moisture determination, wipe off any moisture on the outside of the train and any excess silicone grease at the inlet and outlet openings; weigh the train to the nearest 0.5 g and record this weight. Then disconnect the impingers from each other. Quantitatively transfer the contents of the first three impingers (the knockout impinger and the two 0.1 N H₂SO₄ impingers) to a leak-free storage bottle. Add the water rinses of each of these impingers and connecting glassware from the second set of impingers (containing the 0.1 N NaOH) should be recovered in a similar manner if a Cl₂ analysis is desired. The sample bottle should be marked so that if any sample is lost during transport, a correction proportional to the lost volume can be applied. Save portions of the 0.1 N H₂SO₄ and 0.1 N NaOH used as impinger reagents as reagent blanks. Take 50 ml of each and place in separate leak-free storage bottles. Label and mark the fluid levels as previously described.

3.3.2.7.4 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.2.7.4.1 Nomenclature.

B_w = Water vapor in the gas stream, proportion by volume.
M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

P_{atm} = 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).

R = Ideal gas constant, 0.06236 mm Hg-m³-K-g-mole (21.85 in. Hg-ft³-R-lb-mole).

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

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

V_l = Total volume of liquid collected in impingers and silica gel, ml (equivalent to the difference in weight of the impinger train before and after sampling, 1 mg=1 ml).

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

V_{m,corr} = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dcm (dcf).

V_{m,corr} = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).

Y = Dry gas meter calibration factor.

ρ_w = Density of water, 0.9982 g/ml (0.002201 lb/ml).

3.3.2.7.4.2 Sample volume, dry basis, corrected to standard conditions. Calculate as described below:

$$V_{m,corr} = V_m Y \left[\frac{T_{std}}{T_m} \right] \left[\frac{P_{atm}}{P_{std}} \right] \quad (1)$$

$$= K_1 Y \frac{V_m P_{atm}}{T_m} \quad (2)$$

where:

K₁ = 0.3858 °K/mm Hg for metric units.

K₁ = 17.64 °R/in. Hg for English units.

3.3.2.7.4.3 Volume of water vapor.

$$V_{m,w} = V_m \frac{P_w RT_{std}}{M_w P_{atm}} \quad (3)$$

where:

K₂ = 0.0013333 m³-ml for metric units.

K₂ = 0.04707 ft³-ml for English units.

3.3.2.7.4.4 Moisture content.

$$B_w = \frac{V_{m,w}}{V_{m,corr} + V_{m,w}} \quad (4)$$

3.3.2.8 Quality Control.

3.3.2.8.1 At the present time, a validated audit material does not exist for this method. Analytical quality control procedures are detailed in Method 9057.

3.3.2.9 Method Performance.

Environmental Protection Agency

3.3.2.9.1 The in-stack detection limit for the method is approximately 0.08 µg of HCl per liter of stack gas for a 1-hour sample.

3.3.2.9.2 The precision and bias for measurement of HCl using this sampling protocol combined with the analytical protocol of method 9057 have been determined. The within laboratory relative standard deviation is 6.2 percent and 3.2 percent at HCl concentrations of 3.9 and 15.3 ppm, respectively. The method does not exhibit any bias for HCl when sampling at Cl₂ concentrations less than 50 ppm.

References

- Steinsberger, S.C. and J.H. Margeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA-600/3-89/064, NTIS PB 89 220586-AS.
- State of California, Air Resources Board, Method 421, "Determination of Hydrochloric Acid Emissions from Stationary Sources," March 18, 1987.
- Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride Emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-442, Research Triangle Park, North Carolina, January 22, 1988.
- U.S. Environmental Protection Agency, "Quality Assurance Handbook for Air Pollution Measurement Systems, volume III, Stationary Source Specific Methods," Publication No. EPA-600/4-77-027b, August 1977.
- U.S. Environmental Protection Agency, 40 CFR part 60, appendix A, method 6.

3.3.3 Protocol for Analysis of Samples from HCl/Cl₂ Emission Sampling Train (Method 9057)

3.3.3.1 Scope and Application.

3.3.3.1.1 This method describes the analytical protocol for determination of hydrogen chloride (HCl, CAS Registry Number 7647-01-0) and chloride (Cl₂, CAS Registry Number 7782-50-2) in stack gas emission samples collected from hazardous waste and municipal waste incinerators using the midjet impinger HCl/Cl₂ sampling train (method 0051) or the isokinetic HCl/Cl₂ sampling train (method 0050).

3.3.3.1.2 The lower detection limit is 0.1 µg of chloride (Cl⁻) per ml of sample solution. Samples with concentrations which exceed the linear range of the analytical instrumentation may be diluted.

3.3.3.1.3 This method is recommended for use only by analysts experienced in the use of ion chromatography and in the interpretation of ion chromatograms.

3.3.3.2 Summary of Method.

3.3.3.2.1 The stoichiometry of HCl and Cl₂ collection in the sampling train (see methods 0050 and 0051) is as follows: In the acidified water absorbing solution, the HCl gas is solubilized and forms chloride ions (Cl⁻) according to the following formula:



The Cl₂ gas present in the emissions has a very low solubility in acidified water and passes through to the alkaline absorbing solution where it undergoes hydrolysis to form a proton (H⁺), Cl⁻, and hypochlorous acid (HClO) as shown:



Non-suppressed or suppressed ion chromatography (IC) is used for analysis of the Cl⁻.

3.3.3.3 Interferences.

3.3.3.3.1 Volatile materials which produce chloride ions upon dissolution during sampling are obvious interferences in the measurement of HCl. One likely interferent is diammonium chloride (Cl₂) gas which disproportionates to HCl and hypochlorous acid (HOCl) upon dissolution in water. Cl₂ gas exhibits a low solubility in water, however, and the use of acidic rather than neutral or basic solutions for collection of hydrogen chloride gas greatly reduces the dissolution of any chlorine present. Sampling a 400 ppm HCl gas stream containing 50 ppm Cl₂ with this method does not cause a significant bias. Sampling a 220 ppm HCl gas stream containing 180 ppm Cl₂ results in a positive bias of 3.4 percent in the HCl measurement. Other interferences have not been encountered.

3.3.3.3.2 Reducing agents such as SO₂ may cause a positive bias in the Cl₂ measurement by the following reaction:



3.3.3.4 Apparatus and Materials.

3.3.3.4.1 Volumetric Flasks. Class A, various sizes.

3.3.3.4.2 Volumetric Pipettes. Class A, assortment, to dilute samples to calibration range of the IC.

3.3.3.4.3 Ion Chromatograph. Suppressed or non-suppressed, with a conductivity detector and electronic integrator operating in the peak area mode. Other detectors, a strip chart recorder, and peak heights may be used provided the 5 percent repeatability criteria for sample analysis and the linearity criteria for the calibration curve can be met.

3.3.3.5 Reagents.

3.3.3.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.3.3.5.2 ASTM Type II Water (ASTM D1597-77 (1983)). All references to water in the method refer to ASTM Type II unless otherwise specified.

3.3.3.5.3 Sulfuric acid (0.1 N), H_2SO_4 . To prepare 100 ml, slowly add 0.28 ml of concentrated H_2SO_4 to about 90 ml of water while stirring, and adjust the final volume to 100 ml using additional water. Shake well to mix the solution.

3.3.3.5.4 Sodium hydroxide (0.1 N), NaOH. To prepare 100 ml, dissolve 0.40 g of solid NaOH in about 90 ml of water and adjust the final volume to 100 ml using additional water. Shake well to mix the solution.

3.3.3.5.5 Reagent blank solutions. A separate blank solution of each sampling train reagent used and collected in the field (0.1 N H_2SO_4 and 0.1 N NaOH) should be prepared for analysis with the field samples. For midjet impinger train sample analysis, dilute 30 ml of each reagent with rinse water collected in the field as a blank to the final volume of the samples; for isokinetic train sample analysis, dilute 200 ml to the same final volume as the field samples also using the blank sample of rinse water.

3.3.3.5.6 Sodium chloride, NaCl, stock standard solution. Solutions containing a nominal certified concentration of 1000 mg/L NaCl are commercially available as convenient stock solutions from which working standards can be made by appropriate volumetric dilution. Alternatively, concentrated stock solutions may be produced from reagent grade NaCl that has been dried at 110 °C for two or more hours and then cooled to room temperature in a desiccator immediately before weighing. Accurately weigh 1.6 to 1.7 g of the dried NaCl to within 0.1 mg, dissolve in water, and dilute to 1 liter. The exact Cl^- concentration can be calculated using the equation:

$$\mu g\ Cl^-/ml = g\ of\ NaCl \times 10^{-3} \times 35.45/58.44$$

Refrigerate the stock standard solutions and store no longer than one month.

3.3.3.5.7 Chromatographic eluent. Effective eluents for non-suppressed ion chromatography using a resin- or silica-based weak ion exchange column are a 4 mM potassium hydrogen phthalate solution, adjusted to a pH of 4.0 using a saturated sodium borate solution, and a 4 mM 4-hydroxy benzoate solution, adjusted to a pH of 8.6 using 1 N sodium hydroxide. An effective eluent for suppressed ion chromatography is a solution containing 3 mM sodium bicarbonate and 2.4 mM sodium carbonate. Other dilute solutions buffered to a similar pH that contain no ions interfering with the chromatographic analysis may be used. If, using suppressed ion chromatography, the "water dip" resulting from sample injection is interfering with the chlorine peak, use a 2 mM sodium hydroxide/2.4 mM sodium bicarbonate eluent.

3.3.3.6 Sample Collection, Preservation, and Handling.

3.3.3.6.1 Sample collection using the midjet impinger HCl/Cl₂ train or the isokinetic HCl/Cl₂ train is described in Method 0051 or 0050, respectively.

3.3.3.6.2 Samples should be stored in clearly labeled, tightly sealed containers between sample recovery and analysis. They may be analyzed up to four weeks after collection.

3.3.3.7 Procedure.

3.3.3.7.1 Sample preparation for analysis. Check the liquid level in each sample, and determine if any sample was lost during shipment. If a noticeable amount of leakage has occurred, the volume can be determined from the difference between the initial and final solution levels, and this value can be used to correct the analytical results. For midjet impinger train samples, quantitatively transfer each sample solution to a 100 ml volumetric flask and dilute to 100 ml with water. For isokinetic sampling train samples, quantitatively transfer each sample to a volumetric flask or graduated cylinder and dilute with water to a final volume appropriate for all samples.

3.3.3.7.2 Calibration of Ion Chromatograph.

3.3.3.7.2.1 The ion chromatographic conditions will depend on the type of analytical column used and whether suppressed or non-suppressed ion chromatography is used. Prior to calibration and sample analysis, establish a stable baseline. Next, inject a sample of water, and determine if any Cl^- appears in the chromatogram. If Cl^- is present, repeat the load/injection procedure until no Cl^- is present.

3.3.3.7.2.2 To prepare the calibration standards, dilute given amounts (1.0 ml or greater) of the stock standard solution to convenient volumes, using 0.1 H_2SO_4 or 0.1 NaOH as appropriate. Prepare at least four standards that are within the linear range of the field samples. Inject the calibration standards, starting with the lowest concentration standard first, both before and after injection of the quality control check sample, reagent blank, and field samples. This allows compensation for any instrument drift occurring during sample analysis.

3.3.3.7.2.3 Determine the peak areas, or heights, of the standards and plot individual values versus Cl^- concentrations in $\mu g/ml$. Draw a smooth curve through the points. Use linear regression to calculate a formula describing the resulting linear curve.

3.3.3.7.3 Sample analysis. Between injections of the series of calibration standards, inject in duplicate the reagent blanks and the field samples, including a matrix spike sample. Measure the areas or heights (same as done for the calibration standards) of the Cl^- peaks. Use the average response to determine the concentrations of the field samples, matrix spike, and reagent blanks using

the linear calibration curve. The results for a reagent blank should not exceed 10 percent of the corresponding value for a field sample.

3.3.3.7.4 Calculations. Retain at least one extra decimal figure beyond those contained in the available data in intermediate calculations, and round off only the final answer appropriately.

3.3.3.7.4.1 Total $\mu g\ HCl$ per sample. Calculate as described below:

$$-HCl = (S - B) \times V \times 36.46/35.45 \quad (1)$$

where:

-HCl = Mass of HCl in sample, μg .

S = Analysis of sample, $\mu g\ Cl^-/ml$.

B = Analysis of reagent blank, $\mu g\ Cl^-/ml$.

V = Volume of filtered and diluted sample, ml.

36.46 = Molecular weight of HCl, $\mu g/\mu g\text{-mole}$, and

35.45 = Atomic weight of Cl^- , $\mu g/\mu g\text{-mole}$.

3.3.3.7.4.2 Total $\mu g\ Cl_2$ per sample. Calculate as described below:

$$-Cl_2 = (S - B) \times V \times 70.91/35.45 \quad (2)$$

where:

-Cl₂ = Mass of Cl₂ in sample, μg .

70.91 = Molecular weight of Cl₂, $\mu g/\mu g\text{-mole}$, and

35.45 = Atomic weight of Cl^- , $\mu g/\mu g\text{-mole}$.

3.3.3.7.4.3 Concentration of HCl in the flue gas. Calculate as described below:

$$C = K \times m \times V_{\text{mole}} \quad (3)$$

where:

C = Concentration of HCl or Cl₂, dry basis, mg/dscm.

K = 10^{-3} mg/ μg .

m = Mass of HCl or Cl₂ in sample, μg , and

V_{mole} = Dry gas volume measured by the dry gas meter, corrected to standard conditions, dscm (from Method 0050 or Method 0051).

3.3.3.8 Quality Control.

3.3.3.8.1 At the present time, a validated audit material does not exist for this method. However, it is strongly recommended that a quality control check sample and a matrix spike sample be used.

3.3.3.8.1.1 Quality control check sample. Chloride solutions of reliably known concentrations are available for purchase from the National Bureau of Standards (SRM 3182). The QC check sample should be prepared in the appropriate absorbing reagent at a concentration approximately equal to the mid range calibration standard. The quality control check sample should be injected in duplicate immediately after the calibration standards have been injected for the first time. The Cl^- value obtained for the check sample using the final calibration curve should be within 10 percent of the known value for the check sample.

3.3.3.8.1.2 Matrix spike sample. A portion of at least one field sample should be used to prepare a matrix spike sample. Spike the sample aliquot in the range of the expected

concentration. Analyze the matrix spike sample in duplicate along with the field samples. Based on the matrix spike results, determine the recovery for the spiked material. This should be within 10 percent of the known spike value.

3.3.3.9 Method Performance.

3.3.3.9.1 The lower detection limit of the analytical method is 0.1 μg of Cl^- per ml of sample solution. Samples with concentrations which exceed the linear range of the IC may be diluted.

3.3.3.9.2 The precision and bias for analysis of HCl using this analytical protocol have been measured in combination with the midjet impinger HCl/Cl₂ train (method 0051) for sample collection. The within-laboratory relative standard deviation is 6.2 percent and 3.2 percent at HCl concentrations of 3.9 and 15.3 ppm, respectively. The method does not exhibit any bias for HCl when sampling at Cl_2 concentrations less than 50 ppm.

References

- Steinsberger, S.C. and J.H. Margeson, "Laboratory and Field Evaluation of a Methodology for Determination of Hydrogen Chloride Emissions from Municipal and Hazardous Waste Incinerators," U.S. Environmental Protection Agency, Office of Research and Development, Report No. EPA 600/3-89/064, NTIS PB89 220586-AS.
- State of California, Air Resources Board, Method 421, "Determination of Hydrochloric Acid Emissions from Stationary Sources" March 18, 1987.
- Entropy Environmentalists, Inc., "Laboratory Evaluation of a Sampling and Analysis Method for Hydrogen Chloride emissions from Stationary Sources: Interim Report," EPA Contract No. 68-02-4442, Research Triangle Park, North Carolina, January 22, 1988.
- Determination of Polychlorinated Dibenzop-Dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) from Stationary Sources (Method 23)
 - Applicability and Principle
 - Applicability. This method is applicable to the determination of polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs) from stationary sources.
 - Principle. A sample is withdrawn from the gas stream isokinetically and collected in the sample probe, on a glass fiber filter and on a packed column of adsorbent material. The sample cannot be separated into a particle vapor fraction. The PCDDs and PCDFs are extracted from the sample, separated by high resolution gas chromatography, and measured by high resolution mass spectrometry.

3.4.2.1.3 Sample Transfer Lines. The sample transfer lines, if needed, shall be heat-traced, heavy walled TPE (1/4 in. OD with 1/4 in. wall) with connecting fittings that are capable of forming leak-free, vacuum-tight connections without using sealing greases. The line shall be as short as possible and must be maintained at 120 °C.

3.4.2.1.4 Filter Support. Teflon or Teflon-coated wire.

3.4.2.1.5 Condenser. Glass, coil type with compatible fittings. A schematic diagram is shown in Figure 3.4-2.

3.4.2.1.6 Water Bath. Thermostatically controlled to maintain the gas temperature exiting the condenser at 520 °C (86 °F).

3.4.2.1.7 Adsorbent Module. Glass container to hold the solid adsorbent. A schematic diagram is shown in Figure 3.4-2. Other physical configurations of the resin trap/condenser assembly are acceptable. The connecting fittings shall form leak-free, vacuum tight seals. No sealant greases shall be used in the sampling train. A coarse glass frit is included to retain the adsorbent.

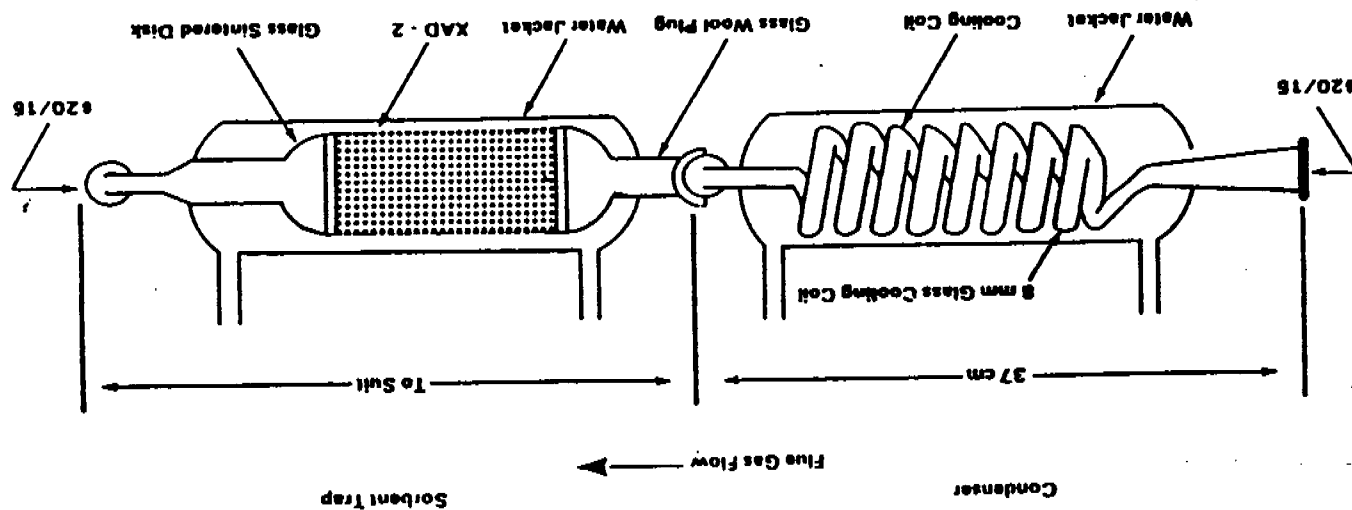


Figure 3.4-2 Condenser and adsorbent trap

34.2.2 Sample Recovery.

34.2.2.1 Fitting Caps. Ground glass, Teflon tape, or aluminum foil (Section 34.2.2.6) to cap off the sample-exposed sections of the train.

34.2.2.2 Wash Bottles. Teflon, 500-ml.

34.2.2.3 Probe-Liner. Probe-Nozzle, and Filter-Holder Brushes. Inert bristle brushes with precleaned stainless steel or Teflon handles. The probe brush shall have extensions of stainless steel or Teflon, at least as long as the probe. The brushes shall be properly sized and shaped to brush out the nozzle, probe liner, and transfer line, if used.

34.2.2.4 Filter Storage Container. Sealed filter holder, wide-mouth amber glass jar with Teflon-lined cap, or glass petri dish.

34.2.2.5 Balance. Triple beam.

34.2.2.6 Aluminum Foil. Heavy duty, hexane-rinsed.

34.2.2.7 Metal Storage Container. Airtight container to store silica gel.

34.2.2.8 Graduated Cylinder. Glass, 250-ml with 2-ml graduation.

34.2.2.9 Glass sample Storage container. Amber glass bottle for sample glassware washes, 500- or 1000-ml, with leak-free Teflon-lined cap.

34.2.3 Analysis.

34.2.3.1 Sample Container. 125- and 250-ml flint glass bottles with Teflon-lined caps.

34.2.3.2 Test Tube. Glass.

34.2.3.3 Soxhlet Extraction Apparatus. Capable of holding 43 x 123 mm extraction thimbles.

34.2.3.4 Extraction Thimble. Glass, precleaned cellulosic, or glass fiber.

34.2.3.5 Pasteur Pipettes. For preparing liquid chromatographic columns.

34.2.3.6 Reacti-vials. Amber glass, 2-ml, silanized prior to use.

34.2.3.7 Rotary Evaporator. Buchi/Brinkman RE-121 or equivalent.

34.2.3.8 Nitrogen Evaporator Concentrator. N-Evap Analytical Evaporator Model III or equivalent.

34.2.3.9 Separatory Funnels. Glass, 2-liter.

34.2.3.10 Gas Chromatograph. Consisting of the following components:

34.2.3.10.1 Oven. Capable of maintaining the separation column at the proper operating temperature $\pm 1^\circ\text{C}$ and performing programmed increases in temperature at rates of at least $3^\circ\text{C}/\text{min}$.

34.2.3.10.2 Temperature Gauge. To monitor column, oven, detector, and exhaust temperatures $\pm 1^\circ\text{C}$.

34.2.3.10.3 Flow System. Gas metering system to measure sample, fuel, combustion gas, and carrier gas flows.

34.2.3.10.4 Capillary Columns. A fused silica column, 60 x 0.25 mm inside diameter (ID), coated with DB-5 and a fused silica column, 30 m x 0.25 mm ID coated with DB-225. Other column systems may be used provided that the user is able to demonstrate, using cali-

bration and performance checks, that the column system is able to meet the specifications of section 34.6.1.2.2.

34.2.3.11 Mass Spectrometer. Capable of routine operation at a resolution of 1:10000 with a stability of ± 5 ppm.

34.2.3.12 Data System. Compatible with the mass spectrometer and capable of monitoring at least five groups of 25 ions.

34.2.3.13 Analytical Balance. To measure within 0.1 mg.

34.3 Reagents

34.3.1 Sampling.

34.3.1.1 Filters. Glass fiber filters, without organic binder, exhibiting at least 99.95 percent efficiency (<0.05 percent penetration) on 0.3-micron dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM Standard Method D 2996-71 (Reapproved 1978) (incorporated by reference—see §60.17).

34.3.1.1.1 Precleaning. All filters shall be cleaned before their initial use. Place a glass extraction thimble, 1 g of silica gel, and a plug of glass wool into a Soxhlet apparatus, charge the apparatus with toluene, and reflux for a minimum of 3 hours. Remove the toluene and discard it, but retain the silica gel. Place no more than 50 filters in the thimble onto the silica gel bed and top with the cleaned glass wool. Charge the Soxhlet with toluene and reflux for 16 hours. After extraction, allow the Soxhlet to cool, remove the toluene extract, and retain it for analysis. Remove the filters and dry them under a clean N_2 stream. Store the filters in a glass petri dish sealed with Teflon tape.

34.3.1.2 Adsorbent Resin. Amberlite XAD-2 resin, thoroughly cleaned before initial use.

34.3.1.2.1 Cleaning Procedure. This procedure may be carried out in a giant Soxhlet extractor. An all-glass filter thimble containing an extra-coarse frit is used for extraction of XAD-2. The frit is recessed 10-15 mm above a crenelated ring at the bottom of the thimble to facilitate drainage. The resin must be carefully retained in the extractor cup with a glass wool plug and a stainless steel ring because it floats on methylene chloride. This process involves sequential extraction in the following order:

Solvent	Procedure
Water	Initial rinse: Place resin in a beaker, rinse once with water, and discard. Fill with water a second time, let stand over night, and discard.
Water	Extract with water for 8 hours.
Methanol	Extract for 22 hours.
Methylene Chloride	Extract for 22 hours.
Methylene Chloride (fresh).	Extract for 22 hours.

34.3.1.2.2 Drying.

34.3.1.2.2.1 Drying Column. PTFE pipe, 10.2 cm ID by 0.6 m long, with suitable retainers.

34.3.1.2.2.2 Procedure. The adsorbent must be dried with clean inert gas. Liquid nitrogen cylinder has proven to be a reliable source of large volumes of gas free from organic contaminants. Connect the liquid nitrogen cylinder to the column by a length of cleaned copper tubing, 0.95 cm ID, coated to pass through a heat source. A convenient heat source is a water-bath heated from a steam line. The final nitrogen temperature should only be warm to the touch and not over 40°C . Continue flowing nitrogen through the adsorbent until all the residual solvent is removed. The flow rate should be sufficient to gently agitate the particles but not so excessive as to cause the particles to fracture.

34.3.1.2.3 Quality Control Check. The adsorbent must be checked for residual methylene chloride as well as PCDDs and PCDFs. 34.3.1.2.3.1 Extraction. Weigh a 1.0 g sample of dried resin into a small vial, add 3 ml of toluene, cap the vial, and shake it well. 34.3.1.2.3.2 Analysis. Inject a 2- μl sample of the extract into a gas chromatograph operated under the following conditions:

Column: 6 ft x $\frac{1}{8}$ in. stainless steel containing 10 percent OV-101 on 100/120 Supelcoport. Carrier Gas: Helium at a rate of 30 ml/min. Detector: Flame ionization detector operated at a sensitivity of 4×10^{-11} A/mV.

Injection Port Temperature: 250°C . Detector Temperature: 305°C .

Oven Temperature: 30°C for 4 min; programmed to rise at $40^\circ\text{C}/\text{min}$ until it reaches 250°C ; return to 30°C after 17 minutes.

Compare the results of the analysis to the results from the reference solution. Prepare the reference solution by injecting 2.5 μl of methylene chloride into 100 ml of toluene. This corresponds to 100 μg of methylene chloride per g of adsorbent. The maximum acceptable concentration is 1000 $\mu\text{g}/\text{g}$ of adsorbent. If the adsorbent exceeds this level, drying must be continued until the excess methylene chloride is removed.

34.3.1.2.3.3 Storage. The adsorbent must be used within 4 weeks of cleaning. After cleaning, it may be stored in a wide mouth amber glass container with a Teflon-lined cap or placed in one of the glass adsorbent modules tightly sealed with glass stoppers. If precleaned adsorbent is purchased in sealed containers, it must be used within 4 weeks after the seal is broken.

34.3.1.3 Glass Wool. Cleaned by sequential immersion in three aliquots of methylene chloride, dried in a 110°C oven, and stored in a methylene chloride-washed glass jar with a Teflon-lined screw cap.

34.3.1.4 Water. Deionized distilled and stored in a methylene chloride-rinsed glass container with a Teflon-lined screw cap.

34.3.1.5 Silica Gel. Indicating type, 6 to 16 mesh. If previously used, dry at 175°C (350 $^\circ\text{F}$) for two hours. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used, subject to the approval of the Administrator.

34.3.1.6 Chromic Acid Cleaning Solution. Dissolve 20 g of sodium dichromate in 15 ml of water, and then carefully add 400 ml of concentrated sulfuric acid.

34.3.2 Sample Recovery.

34.3.2.1 Acetone. Pesticide quality.

34.3.2.2 Methylene Chloride. Pesticide quality.

34.3.2.3 Toluene. Pesticide quality.

34.3.2.3.1 Analysis.

34.3.3.1 Potassium Hydroxide. ACS grade, 2-percent (weight/volume) in water.

34.3.3.2 Sodium Sulfate. Granulated, reagent grade. Purify prior to use by rinsing with methylene chloride and oven drying.

Store the cleaned material in a glass container with a Teflon-lined screw cap.

34.3.3.3 Sulfuric Acid. Reagent grade.

34.3.3.4 Sodium Hydroxide. 1.0 N. Weigh 40 g of sodium hydroxide into a 1-liter volumetric flask. Dilute to 1 liter with water.

34.3.3.5 Hexane. Pesticide grade.

34.3.3.6 Methylene Chloride. Pesticide grade.

34.3.3.7 Benzene. Pesticide grade.

34.3.3.8 Ethyl Acetate.

34.3.3.9 Methanol. Pesticide grade.

34.3.3.10 Toluene. Pesticide grade.

34.3.3.11 Nonane. Pesticide grade.

34.3.3.12 Cyclohexane. Pesticide grade.

34.3.3.13 Basic Alumina. Activity grade 1, 100-200 mesh. Prior to use, activate the alumina by heating for 16 hours at 130°C before use. Store in a desiccator. Pre-activated alumina may be purchased from a supplier and may be used as received.

34.3.3.14 Silica Gel. Bio-Sil A, 100-200 mesh. Prior to use, activate the silica gel by heating for at least 30 minutes at 180°C .

After cooling, rinse the silica gel sequentially with methanol and methylene chloride. Heat the rinsed silica gel at 50°C for 10 minutes, and then increase the temperature gradually to 180°C over 25 minutes and maintain it at this temperature for 80 minutes. Cool at room temperature and store in a glass container with a Teflon-lined screw cap.

34.3.3.15 Silica Gel Impregnated with Sulfuric Acid. Combine 100 g of silica gel with 44 g of concentrated sulfuric acid in a screw-capped glass bottle and agitate thoroughly. Disperse the solids with a stirring rod until a uniform mixture is obtained. Store the mixture in a glass container with a Teflon-lined screw cap.

34.3.3.16 Silica Gel Impregnated with Sodium Hydroxide. Combine 39 g of 1 N sodium hydroxide with 180 g of silica gel in a screw-capped glass bottle and agitate thoroughly.

Disperse solids with a stirring rod until a uniform mixture is obtained. Store the mixture in a glass container with a Teflon-lined screw cap.

3.4.3.3.17 Carbon/Celite. Combine 10.7 g of AX-21 carbon with 124 g of Celite 545 in a 250-ml glass bottle with a Teflon-lined screw cap. Agitate the mixture thoroughly until a uniform mixture is obtained. Store in the glass container.

3.4.3.3.18 Nitrogen. Ultra high purity.

3.4.3.3.19 Hydrogen. Ultra high purity.

3.4.3.3.20 Internal Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 1 under the heading "Surrogate Standards" in 10 ml of nonane.

3.4.3.3.21 Surrogate Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 1 under the heading "Surrogate Standards" in 10 ml of nonane.

3.4.3.3.22 Recovery Standard Solution. Prepare a stock standard solution containing the isotopically labeled PCDDs and PCDFs at the concentrations shown in Table 1 under the heading "Recovery Standards" in 10 ml of nonane.

TABLE 3.4-1.—COMPOSITION OF THE SAMPLE FORTIFICATION AND RECOVERY STANDARDS SOLUTIONS

Analyte	Concentration (pg/l)
Internal Standards:	
¹³ C ₁₂ -2,3,7,8-TCDD	100
¹³ C ₁₂ -1,2,3,7,8-PeCDD	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDD	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDD	100
¹³ C ₁₂ -2,3,7,8-TCDF	100
¹³ C ₁₂ -1,2,3,7,8-PeCDF	100
¹³ C ₁₂ -1,2,3,6,7,8-HxCDF	100
¹³ C ₁₂ -1,2,3,4,6,7,8-HpCDF	100
Surrogate Standards:	
¹³ C ₁₂ -2,3,7,8-TCDD	100
¹³ C ₁₂ -1,2,3,4,7,8-HxCDD	100
¹³ C ₁₂ -2,3,4,7,8-PeCDF	100
¹³ C ₁₂ -1,2,3,4,7,8-HpCDF	100
¹³ C ₁₂ -1,2,3,4,7,8-HpCDF	100
Recovery Standards:	
¹³ C ₁₂ -1,2,3,4-TCDD	500
¹³ C ₁₂ -1,2,3,7,8,9-HxCDD	500

3.4.4 Procedure

3.4.4.1 Sampling. The complexity of this method is such that, in order to obtain reliable results, analysts should be trained and experienced with the analytical procedures.

3.4.4.1.1 Preparation Prior to Analysis.

3.4.4.1.1.1 Cleaning Glassware. All glass components of the train upstream of and including the adsorbent module, shall be cleaned as described in Section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environ-

mental Samples." Special care shall be devoted to the removal of residual silicone grease sealants on ground glass connections of used glassware. Any residue shall be removed by soaking the glassware for several hours in a chromic acid cleaning solution prior to cleaning as described above.

3.4.4.1.1.2 Adsorbent Trap. The traps must be loaded in a clean area to avoid contamination. They may not be loaded in the field. Fill a trap with 20 to 40 g of XAD-2. Follow both ends of the trap. Add 100 µl of the surrogate standard solution (Section 3.4.3.3.21) to each trap.

3.4.4.1.1.3 Sample Train. It is suggested that all components be maintained according to the procedure described in APTD-0576.

3.4.4.1.1.4 Silica Gel. Weigh several 200 to 300 g portions of silica gel in an air-tight container to the nearest 0.5 g. Record the total weight of the silica gel plus container, on each container. As an alternative, the silica gel may be weighed directly in its impinger or sample holder just prior to sampling.

3.4.4.1.1.5 Filter. Check each filter against light for irregularities and flaws or pinholes leaks. Pack the filters flat in a clean glass container.

3.4.4.1.2 Preliminary Determinations. Same as Section 4.1.2 of Method 5.

3.4.4.1.3 Preparation of Collection Train.

3.4.4.1.3.1 During preparation and assembly of the sampling train, keep all train openings where contamination can enter, sealed until just prior to assembly or until sampling is about to begin.

NOTE: Do not use sealant grease in assembling the train.

3.4.4.1.3.2 Place approximately 100 ml of water in the second and third impingers, leave the first and fourth impingers empty, and transfer approximately 200 to 300 g of preweighed silica gel from its container to the fifth impinger.

3.4.4.1.3.3 Place the silica gel container in a clean place for later use in the sample recovery. Alternatively, the weight of the silica gel plus impinger may be determined to the nearest 0.5 g and recorded.

3.4.4.1.3.4 Assemble the train as shown in Figure 3.4-1.

3.4.4.1.3.5 Turn on the adsorbent module and condenser coil recirculating pump and begin monitoring the adsorbent module gas entry temperature. Ensure proper sorbent temperature gas entry temperature before proceeding and before sampling is initiated. It is extremely important that the XAD-2 adsorbent resin temperature never exceed 50 °C because thermal decomposition will occur. During testing, the XAD-2 temperature must not exceed 20 °C for efficient capture of the PCDDs and PCDFs.

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3.4.4.1.4 Leak-Check Procedure. Same as method 5, section 4.1.4.

3.4.4.1.5 Sample Train Operation. Same as method 5, section 4.1.5.

3.4.4.2 Sample Recovery. Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Seal the nozzle end of the sampling probe with Teflon tape or aluminum foil.

When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe. Remove the probe from the train and close off both ends with aluminum foil. Seal off the inlet to the train with Teflon tape, a ground glass cap, or aluminum foil.

Transfer the probe and impinger assembly to the cleanup area. This area shall be clean and enclosed so that the chances of losing or contaminating the sample are minimized. Smoking, which could contaminate the sample, shall not be allowed in the cleanup area. Inspect the train prior to and during disassembly and note any abnormal conditions, e.g., broken filters, colored impinger liquid, etc. Treat the samples as follows:

3.4.4.2.1 Container No. 1. Either seal the filter holder or carefully remove the filter from the filter holder and place it in its identified container. Use a pair of cleaned tweezers to handle the filter. If it is necessary to fold the filter, do so such that the particulate cake is inside the fold. Carefully transfer to the container any particulate matter and filter fibers which adhere to the filter holder gasket, by using a dry inert bristle brush and a sharp-edged blade. Seal the container.

3.4.4.2.2 Adsorbent Module. Remove the module from the train, tightly cap both ends, label it, cover with aluminum foil, and store it on ice for transport to the laboratory.

3.4.4.2.3 Container No. 2. Quantitatively recover material deposited in the nozzle, probe transfer lines, the front half of the filter holder, and the cyclone. If used, first, by brushing while rinsing three times each with acetone, and then by rinsing the probe three times with methylene chloride. Collect all the rinses in Container No. 2.

Rinse the back half of the filter holder three times with acetone. Rinse the connecting line between the filter and the condenser three times with acetone. Soak the connecting line with three separate portions of methylene chloride for 5 minutes each. If using a separate condenser and adsorbent trap, rinse the condenser in the same manner as the connecting line. Collect all the rinses in Container No. 2 and mark the level of the liquid on the container.

3.4.4.2.4 Container No. 3. Repeat the methylene chloride-rinsing described in section 3.4.4.2.3 using toluene as the rinse solvent.

Collect the rinses in Container No. 3 and mark the level of the liquid on the container.

3.4.4.2.5 Impinger Water. Measure the liquid in the first three impingers to within ±1 ml by using a graduated cylinder or by weighing it to within ±0.5 g by using a balance. Record the volume or weight of liquid present. This information is required to calculate the moisture content of the effluent gas.

Discard the liquid after measuring and recording the volume or weight.

3.4.4.2.6 Silica Gel. Note the color of the indicating silica gel to determine if it has been completely spent and make a mention of its condition. Transfer the silica gel from the fifth impinger to its original container and seal.

3.4.5 Analysis

All glassware shall be cleaned as described in section 3A of the "Manual of Analytical Methods for the Analysis of Pesticides in Human and Environmental Samples." All samples must be extracted within 30 days of collection and analyzed within 45 days of extraction.

3.4.5.1 Sample Extraction.

3.4.5.1.1 Extraction System. Place an extractable thimble (section 3.4.2.3.4), 1 g of silica gel, and a plug of glass wool into the Soxhlet apparatus, charge the apparatus with toluene, and reflux for a minimum of 3 hours. Remove the toluene and discard it, but retain the silica gel. Remove the extraction thimble from the extraction system and place it in a glass beaker to catch the solvent rinses.

3.4.5.1.2 Container No. 1 (Filter). Transfer the contents of container number 1 directly to the glass thimble of the extraction system and extract them simultaneously with the XAD-2 resin.

3.4.5.1.3 Adsorbent Module. Suspend the adsorbent module directly over the extraction thimble in the beaker (see section 3.4.5.1.1). The glass frit of the module should be in the up position. Using a Teflon squeeze bottle containing toluene, flush the XAD-2 into the thimble onto the bed of cleaned silica gel. Thoroughly rinse the glass module catching the rinsings in the beaker containing the thimble. If the resin is wet, effective extraction can be accomplished by loosely packing the resin in the thimble. Add the XAD-2 glass wool plug to the thimble.

3.4.5.1.4 Container No. 2 (Acetone and Methylene Chloride Rinse). Concentrate the sample to a volume of about 1-5 ml using the rotary evaporator apparatus, at a temperature of less than 37 °C. Rinse the sample container three times with small portions of methylene chloride and add these to the concentrated solution and concentrate further to near dryness. This residue contains particulate matter removed in the rinses of the train probe and nozzle. Add the concentrate

3.4.5.3.1.3 Oven. Initially at 150 °C. Raise by at least 40 °C/min to 190 °C and then at 3 °C/min up to 300 °C.
3.4.5.3.2.3 Source Temperature 250 °C.
3.4.5.3.2.4 Monitoring Mode. Selected ion monitoring. A list of the various ions to be monitored is summarized in Table 3.4-2.
3.4.5.3.2.1 Resolution. 10000 m/e.

TABLE 3.4-2.—ELEMENTAL COMPOSITIONS AND EXACT MASSES OF THE IONS MONITORED BY HIGH RESOLUTION MASS SPECTROMETRY FOR PCDDs AND PCDFs

Descriptor no.	Accurate mass	Ion type	Elemental composition	Analyte
1	(Not used)	LOCK	C ₁₇ H ₁₁	PFK
2	282.0625	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	305.9016	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	315.9419	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	317.9399	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	319.8965	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	321.8936	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	327.8947	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	330.8792	OC	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	PFK
	331.9368	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	338.8397	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	341.8567	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	351.9000	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	353.8970	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	355.8546	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	357.8516	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	359.8919	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	369.8364	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	373.8206	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	375.8178	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	383.8639	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	386.8157	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	381.8127	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	392.8760	LOCK	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	PFK
	401.8559	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	403.8529	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	445.7555	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	430.8729	OC	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	PFK
	407.7818	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	409.7789	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	417.8253	M	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	419.8220	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	423.7766	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	425.7737	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	435.8169	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	437.8140	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF (S)
	479.7165	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	430.9729	LOCK	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	PFK
	441.7428	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	443.7389	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	457.7377	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	459.7348	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	469.7779	M+2	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	471.7750	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	513.8775	M+4	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	TCDF
	442.9728	OC	C ₁₇ H ₁₁ ¹³ C ¹⁸ O	PFK

*The following nucleic masses were used: H-1.007825, O-15.994915, C-12.000000, ¹³C-13.003355, ¹⁸O-16.999131, F-18.9984, S-32.059539, OC-Ion selected for monitoring instrument stability during the GC/MS analysis.

TABLE 3.4-3.—ACCEPTABLE RANGES FOR ION-ABUNDANCE RATIOS OF PCDDs AND PCDFs

Number of Chlorine atoms	Ion type	Theoretical ratio	Control limits	
			Lower	Upper
MM+2		0.77	0.65	0.99

concentrated extract from the silica gel column to the top of the basic alumina column and elute the column sequentially with 120 ml of 0.5 percent methylene chloride in hexane followed by 120 ml of 35 percent methylene chloride in hexane. Discard the first 120 ml of eluate. Collect the second 120 ml of eluate and concentrate it to about 0.5 ml using the nitrogen evaporative concentrator.

3.4.5.3.3 AX-21 Carbon/Celite 545 Column. Remove the bottom 0.5 in. from the tip of a 9-ml disposable Pasteur pipette. Insert a glass fiber filter disk in the top of the pipette 2.5 cm from the constriction. Add sufficient carbon/celite mixture to form a 2 cm column. Top with a glass wool plug. In some cases, AX-21 carbon fines may wash through the glass wool plug and enter the sample. This may be prevented by adding a celite plug to the exit end of the column. Rinse the column in sequence with 2 ml of 50 percent benzene in ethyl acetate, 1 ml of 50 percent benzene in ethyl acetate, and 2 ml of methylene chloride in cyclohexane, and 2 ml of hexane. Discard these rinses. Transfer the concentrate in 1 ml of hexane from the basic alumina column to the carbon/celite column along with 1 ml of hexane rinse. Elute the column sequentially with 2 ml of 50 percent methylene chloride in hexane and 2 ml of 50 percent benzene in ethyl acetate and discard these eluates. Invert the column and elute in the reverse direction with 13 ml of toluene. Collect this eluate. Concentrate the eluate in a rotary evaporator at 50 °C to about 1 ml. Transfer the concentrate to a Reacti-vial using a toluene rinse and concentrate to a volume of 200 µl using a stream of N₂. Store extracts at room temperature, shielded from light, until the analysis is performed.

3.4.5.3 Analysis. Analyze the sample with a gas chromatograph coupled to a mass spectrometer (GC/MS) using the instrumental parameters in sections 3.4.5.3.1 and 3.4.5.3.2. Immediately prior to analysis, add a 20-µl aliquot of the Recovery Standard solution from Table 1 to each sample. A 2-µl aliquot of the extract is injected into the GC. Sample extracts are first analyzed using the DB-5 capillary column to determine the concentration of each isomer of PCDDs and PCDFs (tetra- through octa-). If tetra-chlorinated dibenzofurans are detected in this analysis, then analyze another aliquot of the sample in a separate run, using the DB-225 column to measure the 2,3,7,8-tetrachlorodibenzofuran isomer. Other column systems may be used, provided that the user is able to demonstrate, using calibration and performance checks, that the column system is able to meet the specifications of Section 3.4.5.1.2.2.

3.4.5.3.1 Gas Chromatograph Operating Conditions.
3.4.5.3.1.1 Injector. Configured for capillary column, splitless, 250 °C.
3.4.5.3.1.2 Carrier Gas. Helium, 1-2 ml/min.

to the filter and the XAD-2 resin in the Soxhlet apparatus described in section 3.4.5.1.1.

3.4.5.1.6 Extraction. Add 100 µl of the Internal Standard solution (section 3.4.3.3.20) to the extraction thimble containing the contents of the adsorbent cartridge, the contents of Container No. 1, and the concentrate from section 3.4.5.1.3. Cover the contents of the extraction thimble with the cleaned glass wool plug to prevent the XAD-2 resin from floating into the solvent reservoir of the extractor. Place the thimble in the extractor, and add the toluene contained in the beaker to the solvent reservoir. Four additional toluene to fill the reservoir approximately ¾ full. Add Teflon boiling chips and assemble the apparatus. Adjust the heat source to cause the extractor to cycle three times per hour. Extract the sample for 16 hours. After extraction, allow the Soxhlet to cool. Transfer the toluene extract and concentrate the extract to approximately 10 ml. At this point the analyst may choose to split the sample in half. If so, split the sample, store one half for future use, and analyze the other according to the procedures in sections 3.4.5.2 and 3.4.5.3. In either case, use a nitrogen evaporative concentrator to reduce the volume of the sample being analyzed to near dryness. Dissolve the residue in 5 ml of hexane.

3.4.5.1.6 Container No. 3 (Toluene Rinse). Add 100 µl of the Internal Standard solution (section 3.4.3.3.20) to the contents of the container. Concentrate the sample to a volume of about 1-5 ml using the rotary evaporator apparatus at a temperature of less than 37 °C. Rinse the sample container three times with small portions of toluene and add these to the concentrated solution and concentrate further to near dryness. Analyze the extract separately according to the procedures in sections 3.4.5.2 and 3.4.5.3, but concentrate the solution in a rotary evaporator apparatus rather than a nitrogen evaporative concentrator.

3.4.5.2 Sample Cleanup and Fractionation. 3.4.5.2.1 Silica Gel Column. Pack one end of a glass column, 20 mm×200 mm, with glass wool. Add in sequence, 1 g silica gel, 2 g of sodium hydroxide impregnated silica gel, 1 g silica gel, 4 g of acid-modified silica gel, and 1 g of silica gel. Wash the column with 30 ml of hexane and discard it. Add the sample extract, dissolved in 5 ml of hexane to the column with two additional 5-ml rinses. Elute the column with an additional 90 ml of hexane and retain the entire eluate. Concentrate this solution to a volume of about 1 ml using the nitrogen evaporative concentrator (section 3.4.2.3.8).

3.4.5.2.2 Basic Alumina Column. Shorten a 25-ml disposable Pasteur pipette to about 16 ml. Pack the lower section with glass wool and 12 g of basic alumina. Transfer the con-

TABLE 3.4-3.—ACCEPTABLE RANGES FOR ION-ABUNDANCE RATIOS OF PCDDs AND PCDFs—
Continued

Number of Chlorine atoms	Ion type	Theoretical ratio	Control limits	
			Lower	Upper
5	M-2M+4	1.55	1.32	1.78
6	M-2M+4	1.24	1.05	1.43
6	M+M-2	0.51	0.43	0.59
7	M+M-2	0.44	0.37	0.51
7	M-2M+4	1.04	0.86	1.20
8	M-2M+4	0.89	0.76	1.02

*Used only for ¹²C-HxCDF

*Used only for ¹²C-HxCDF

3.4.5.3.2.5 Identification Criteria. The following identification criteria shall be used for the characterization of polychlorinated dibenzodioxins and dibenzofurans.

1. The integrated ion-abundance ratio (M/M+2 or M-2M+4) shall be within 15 percent of the theoretical value. The acceptable ion-abundance ratio ranges for the identification of chlorine-containing compounds are given in Table 3.

2. The retention time for the analytes must be within 3 seconds of the corresponding ¹²C-labeled internal standard, surrogate or alternate standard.

3. The monitored ions, shown in Table 3.4-2 for a given analyte, shall reach their maximum within 2 seconds of each other.

4. The identification of specific isomers that do not have corresponding ¹²C-labeled standards is done by comparison of the relative retention time (RRT) of the analyte to the nearest internal standard retention time with reference (i.e., within 0.005 RRT units) to the comparable RRTs found in the continuing calibration.

5. The signal to noise ratio for all monitored ions must be greater than 2.5.

6. The confirmation of 2,3,7,8-TCDD and 2,3,7,8-TCDF shall satisfy all of the above identification criteria.

7. For the identification of PCDFs, no signal may be found in the corresponding PCDD channels.

3.4.5.3.2.6 Quantitation. The peak areas for the two ions monitored for each analyte are summed to yield the total response for each analyte. Each internal standard is used to quantitate the indigenous PCDDs or PCDFs in its homologous series. For example, the ¹²C₁₂-2,3,7,8-tetrachlorodibenzodioxin is used to calculate the concentrations of all other tetrachlorinated isomers. Recoveries of the tetra- and penta-internal standards are calculated using the ¹²C₁₂-1,2,3,4-TCDD. Recoveries of the hexa- through octa-internal standards are calculated using ¹²C₁₂-

1,2,3,7,8,9-HxCDD. Recoveries of the surrogate standards are calculated using the corresponding homolog from the internal standard.

3.4.6 Calibration

Same as Method 5 with the following additions.

3.4.6.1 GC/MS System.

3.4.6.1.1 Initial Calibration. Calibrate the GC/MS system using the set of five standards shown in Table 3.4-4. The relative standard deviation for the mean response factor from each of the unlabeled analytes (Table 4) and of the internal, surrogate, and alternate standards shall be less than or equal to the values in Table 3.4-5. The signal to noise ratio for the GC signal present in every selected ion current profile shall be greater than or equal to 2.5. The ion abundance ratios shall be within the control limits in Table 3.4-3.

3.4.6.1.2 Daily Performance Check.

3.4.6.1.2.1 Calibration Check. Inject one µl of solution Number 3 from table 4. Calculate the relative response factor (RRF) for each compound and compare each RRF to the corresponding mean RRF obtained during the initial calibration. The analyzer performance is acceptable if the measured RRFs for the labeled and unlabeled compounds for the daily run are within the limits of the mean values shown in Table 3.4-5. In addition, the ion-abundance ratios shall be within the allowable control limits shown in Table 3.4-3.

3.4.6.1.2.2 Column Separation Check. Inject a solution of a mixture of PCDDs and PCDFs that documents resolution between 2,3,7,8-TCDD and other TCDD isomers. Resolution is defined as a valley between peaks that is less than 25 percent of the lower of the two peaks. Identify and record the retention time windows for each homologous series.

TABLE 3.4-4.—COMPOSITION OF THE INITIAL CALIBRATION SOLUTIONS

Compound	Sol- u- tion No.	Concentrations (ppb/L)			
		1	2	3	4
Unlabeled Analytes					
2,3,7,8-TCDD	0.5	1	5	50	100
2,3,7,8-TCDF	0.5	1	5	50	100
1,2,3,7,8-PeCDD	2.5	5	25	250	500
1,2,3,7,8-PeCDF	2.5	5	25	250	500
1,2,3,4,7,8-HxCDD	2.5	5	25	250	500
1,2,3,4,7,8-HxCDF	2.5	5	25	250	500
1,2,3,6,7,8-HxCDD	2.5	5	25	250	500
1,2,3,6,7,8-HxCDF	2.5	5	25	250	500
1,2,3,7,8,9-HxCDD	2.5	5	25	250	500
1,2,3,7,8,9-HxCDF	2.5	5	25	250	500
1,2,3,6,7,9-HxCDF	2.5	5	25	250	500
2,3,4,6,7,8-HxCDD	2.5	5	25	250	500
2,3,4,6,7,8-HxCDF	2.5	5	25	250	500
1,2,3,4,6,7,8-HpCDD	2.5	5	25	250	500
1,2,3,4,6,7,8-HpCDF	2.5	5	25	250	500
1,2,3,4,7,8,9-HpCDD	2.5	5	25	250	500
OCDD	5.0	10	50	500	1000
OCDF	5.0	10	50	500	1000
Internal Standards					
¹² C ₁₂ -2,3,7,8-TCDD	100	100	100	100	100
¹² C ₁₂ -1,2,3,7,8-PeCDD	100	100	100	100	100
¹² C ₁₂ -1,2,3,6,7,8-HxCDD	100	100	100	100	100
¹² C ₁₂ -1,2,3,4,6,7,8-HpCDD	100	100	100	100	100
¹² C ₁₂ -OCDD	200	200	200	200	200
¹² C ₁₂ -2,3,7,8-TCDF	100	100	100	100	100
¹² C ₁₂ -1,2,3,7,8-PeCDF	100	100	100	100	100
¹² C ₁₂ -1,2,3,6,7,8-HxCDF	100	100	100	100	100
¹² C ₁₂ -1,2,3,4,6,7,8-HpCDF	100	100	100	100	100
Surrogate Standards					
¹³ C ₁₂ -2,3,7,8-TCDD	0.5	1	5	50	100
¹³ C ₁₂ -2,3,7,8-PeCDF	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8-HxCDD	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8-HxCDF	2.5	5	25	250	500
¹³ C ₁₂ -1,2,3,4,7,8,9-HpCDF	2.5	5	25	250	500
Alternative Standard					
¹³ C ₁₂ -1,2,3,7,8,9-HxCDF	2.5	5	25	250	500
Recovery Standards					
¹³ C ₁₂ -1,2,3,4-TCDD	100	100	100	100	100
¹³ C ₁₂ -1,2,3,7,8,9-HxCDD	100	100	100	100	100

Perform a similar resolution check on the confirmation column to document the resolution between 2,3,7,8-TCDF and other TCDF isomers.

3.4.6.2 Lock Channels. Set mass spectrometer lock channels as specified in Table 3.4-5. Monitor the quality control check channels specified in Table 3.4-3 to verify instrument stability during the analysis.

3.4.7 Quality Control

3.4.7.1 Sampling Train Collection Efficiency Check. Add 100 µl of the surrogate standards in Table 3.4-1 to the adsorbent cartridge of each train before collecting the field samples.

3.4.7.2 Internal Standard Percent Recoveries. A group of nine carbon-labeled PCDDs and PCDFs, representing the tetra- through octachlorinated homologues, is added to every sample prior to extraction. The role of the internal standards is to quantitate the native PCDDs and PCDFs present in the sample as well as to determine the overall method efficiency. Recoveries of the internal standards must be between 40 to 130 percent for the tetra- through hexachlorinated compounds while the range is 25 to 130 percent for the higher hepta- and octachlorinated homologues.

3.4.7.3 Surrogate Recoveries. The five surrogate compounds in Table 3.4-4 are added to the resin the adsorbent sampling cartridge before the sample is collected. The surrogate recoveries are measured relative to the internal standards and are a measure of collection efficiency. They are not used to measure native PCDDs and PCDFs. All recoveries shall be between 70 and 130 percent. Poor recoveries for all the surrogates may be an indication of breakthrough in the sampling train. If the recovery of all standards is below 70 percent, the sampling runs must be repeated. As an alternative, the sampling runs do not have to be repeated if the final results are divided by the fraction of surrogate recovery. Poor recoveries of isolated surrogate compounds should not be grounds for rejecting an entire set of samples.

3.4.7.4 Toluene QA Rinse. Report the results of the toluene QA rinse separately from the total sample catch. Do not add it to the total sample.

3.4.8 Quality Assurance

3.4.8.1 Applicability. When the method is used to analyze samples to demonstrate compliance with a source emission regulation, an audit sample must be analyzed, subject to availability.

3.4.8.2 Audit Procedure. Analyze an audit sample with each set of compliance samples. The audit sample contains tetra- through octa isomers of PCDD and PCDF. Concurrently, analyze the audit sample and a set of compliance samples in the same manner to

evaluate the technique of the analyst and the standards preparation. The same analyst, analytical reagents, and analytical system shall be used both for the compliance samples and the EPA audit sample.

3.4.8.3 Audit Sample Availability. Audit samples will be supplied only to enforcement agencies for compliance tests. The availability of audit samples may be obtained by writing: Source Test Audit Coordinator (MD-77B), Quality Assurance Division, Atmospheric Research and Exposure Assessment Laboratory, U.S. Environmental Protection Agency, Research Triangle Park, NC 27711, or by calling the Source Test Audit Coordinator (STAC) at (919) 541-7634. The request for the audit sample must be made at least 30 days prior to the scheduled compliance sample analysis.

3.4.8.4 Audit Results. Calculate the audit sample concentration according to the calculation procedure described in the audit instructions included with the audit sample. Fill in the audit sample concentration and the analyst's name on the audit response form included with the audit instructions. Send one copy to the EPA Regional Office or the appropriate enforcement agency and a second copy to the STAC. The EPA Regional Office or the appropriate enforcement agency will report the results of the audit to the laboratory being audited. Include this response with the results of the compliance samples in relevant reports to the EPA Regional Office or the appropriate enforcement agency.

3.4.9 Calculations

Same as method 5, section 6 with the following additions.

3.4.9.1 Nomenclature.

A_{ij} = Integrated ion current of the noise at the retention time of the analyte.

A^*_{ij} = Integrated ion current of the two ions characteristic of the internal standard i in the calibration standard.

A_{ij0} = Integrated ion current of the two ions characteristic of compound i in the j th calibration standard.

A^*_{ij0} = Integrated ion current of the two ions characteristic of the internal standard i in the j th calibration standard.

A_{ij0} = Integrated ion current of the two ions characteristic of surrogate compound i in the calibration standard.

A_{ij} = Integrated ion current of the two ions characteristic of compound i in the sample.

A^*_{ij} = Integrated ion current of the two ions characteristic of internal standard i in the sample.

A_{ij} = Integrated ion current of the two ions characteristic of the recovery standard.

A^*_{ij} = Integrated ion current of the two ions characteristic of surrogate compound i in the sample.

TABLE 3.4-5.—MINIMUM REQUIREMENTS FOR INITIAL AND DAILY CALIBRATION RESPONSE FACTORS

Compound	Unlabeled Analyses		Relative Response Factors	Daily Calibration % DR
	2,3,7,8-TCDD	2,3,7,8-TCDF		
	2,3,7,8-TCDD	2,3,7,8-TCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD	1,2,3,7,8-PeCDF	25	25
	1,2,3,7,8-PeCDD</			

C_i = Concentration of PCDD or PCDF i in the sample, pg/M³.

C_T = Total concentration of PCDDs or PCDFs in the sample, pg/M³.

m_{i1} = Mass of compound i in the calibration standard injected into the analyzer, pg.

m_{i2} = Mass of labeled compound i in the calibration standard injected into the analyzer, pg.

m_{i3} = Mass of internal standard i added to the sample, pg.

m_{i4} = Mass of recovery standard in the calibration standard injected into the analyzer, pg.

m_{i5} = Mass of surrogate compound i in the calibration standard, pg.

RRF_i = Relative response factor.

RRF_{m_i} = Recovery standard response factor.

RRF_s = Surrogate compound response factor.

3.4.9.2 Average Relative Response Factor.

$$RRF = \frac{1}{n} \sum \left[\frac{A_{ij} m_{i3}}{m_{i4}} \left(\frac{A_{i5}}{m_{i5}} \right) \right] \quad \text{Eq. 23-1}$$

3.4.9.3 Concentration of the PCDDs and PCDFs.

$$C_i = \frac{m_{i1} A_{i1}}{A_{i1} RRF_i V_{inj(i)}} \quad \text{Eq. 23-2}$$

3.4.9.4 Recovery Standard Response Factor.

$$RRF_{m_i} = \frac{A_{i1} m_{i3}}{A_{i1} m_{i4}} \quad \text{Eq. 23-3}$$

3.4.9.5 Recovery of Internal Standards (R_i).

$$R_i = \frac{A_{i1} m_{i3}}{m_{i4} RRF_i} \times 100\% \quad \text{Eq. 23-4}$$

3.4.9.6 Surrogate Compound Response Factor.

$$RRF_s = \frac{A_{i1} m_{i3}}{m_{i4} RRF_i} \quad \text{Eq. 23-5}$$

3.4.9.7 Recovery of Surrogate Compounds (R_s).

$$R_s = \frac{m_{i1} RRF_i}{A_{i1} RRF_i} \times 100\% \quad \text{Eq. 23-6}$$

3.4.9.8 Minimum Detectable Limit (MDL).

$$MDL = 2.5 A_{i1} m_{i3} / (A_{i1} RRF_i) \quad \text{Eq. 23-7}$$

3.4.9.9 Total Concentration of PCDDs and PCDFs in the Sample.

$$C_T = \sum_{i=1}^n C_i \quad \text{Eq. 23-8}$$

3.4.10 Bibliography

1. American Society of Mechanical Engineers. Sampling for the Determination of Chlorinated Organic Compounds in Stack Emissions. Prepared for U.S. Department of Energy and U.S. Environmental Protection Agency. Washington, DC December 1984, 23 p.

2. American Society of Mechanical Engineers. Analytical Procedures to Assay Stack Effluent Samples and Residual Combustion Products for Polychlorinated Dibenzop-Dioxins (PCDD) and Polychlorinated

Dibenzofurans (PCDF). Prepared for the U.S. Department of Energy and U.S. Environmental Protection Agency. Washington, DC December 1984, 23 p.

3. Thompson, J.R. (ed.) Analysis of Pesticide Residues in Human and Environmental Samples. U.S. Environmental Protection Agency. Research Triangle Park, NC 1974.

4. Triangle Laboratories. Case Study: Analysis of Samples for the Presence of Tetra-Through Octachloro-p-Dibenzodioxins and Dibenzofurans. Research Triangle Park, NC 1988, 26 p.

5. U.S. Environmental Protection Agency. Draft Method 8280—The Analysis of Polychlorinated Dibenzop-dioxin and Polychlorinated Dibenzofurans by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry. In: Test Methods for Evaluating Solid Waste. Washington, DC SW-846.

3.5 Sampling for Aldehyde and Ketone Emissions from Stationary Sources (Method 001)

3.5.1 Scope and Application

This method is applicable to the determination of Destruction and Removal Efficiency (DRE) of formaldehyde, CAS Registry number 50-00-0, and possibly other aldehydes and ketones from stationary sources as specified in the regulations. The methodology has been applied specifically to formaldehyde; however, many laboratories have extended the application to other aldehydes and ketones. Compounds derivatized with 2,4-dinitrophenyl-hydrazine can be detected as low as 6.4×10^{-5} lbs/cu ft (1.8 ppbv) in stack gas over a 1 hr sampling period, sampling approximately 40 cu ft.

3.5.2 Summary of Method

3.5.2.1 Gaseous and particulate pollutants are withdrawn isokinetically from an emission source and are collected in aqueous acidic 2,4-dinitrophenyl-hydrazine. Formaldehyde present in the emissions reacts with the 2,4-dinitrophenyl-hydrazine to form the formaldehyde dinitrophenylhydrazine derivative. The dinitrophenylhydrazine derivative is extracted, solvent-exchanged, concentrated, and then analyzed by high performance liquid chromatography.

3.5.3 Interferences

3.5.3.1 A decomposition product of 2,4-dinitrophenyl-hydrazine, 2,4-dinitroaniline, can be an analytical interferent if concentrations are high. 2,4-Dinitroaniline can coelute with 2,4-dinitrophenylhydrazine of formaldehyde under high performance liquid chromatography conditions, which may be used for the analysis. High concentrations of highly-oxygenated compounds, especially acetone, that have the same retention time or

nearly the same retention time as the dinitrophenylhydrazine of formaldehyde, and that also absorb at 380 nm, will interfere with the analysis.

Formaldehyde, acetone, and 2,4-dinitroaniline contamination of the aqueous acidic 2,4-dinitrophenyl-hydrazine (DNPH) reagent is frequently encountered. The reagent must be prepared within five days of use in the field and must be stored in an uncontaminated environment both before and after sampling in order to minimize blank problems. Some concentration of acetone contamination is unavoidable, because acetone is ubiquitous in laboratory and field operations. However, the acetone contamination must be minimized.

3.5.4 Apparatus and Materials

3.5.4.1 A schematic of the sampling train is shown in Figure 3.5-1. This sampling train configuration is adapted from EPA method 4 procedures. The sampling train consists of the following components: Probe Nozzle, Pitot Tube, Differential Pressure Gauge, Metering System, Barometer, and Gas Density Determination Equipment.

3.5.4.1.1 Probe Nozzle: Quartz or glass with sharp, tapered (30° angle) leading edge. The taper shall be on the outside to preserve a constant inner diameter. The nozzle shall be buttonhook or elbow design. A range of nozzle sizes suitable for isokinetic sampling should be available in increments of 0.15 cm (1/16 in), e.g., 0.32 to 1.27 cm (1/8 to 1/2 in), of larger if higher volume sampling trains are used. Each nozzle shall be calibrated according to the procedures outlined in section 3.5.8.1.

3.5.4.1.2 Probe Liner: Borosilicate glass or quartz shall be used for the probe liner. The liner should not allow the temperature in the probe to exceed $120 \pm 14^\circ\text{C}$ ($248 \pm 25^\circ\text{F}$).

3.5.4.1.3 Pitot Tube: The Pitot tube shall be Type S, as described in section 2.1 of EPA method 2, or any other appropriate device. The pitot tube shall be attached to the probe to allow constant monitoring of the stack gas velocity. The impact (high pressure) opening plane of the pitot tube shall be even with or above the nozzle entry plane (see EPA method 2, Figure 26b) during sampling. The Type S pitot tube assembly shall have a known coefficient, determined as outlined in section 4 of EPA method 2.

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3.5.4.1.4 Differential Pressure Gauge: The differential pressure gauge shall be an inclined manometer or equivalent device as described in section 2.2 of EPA method 2. One manometer shall be used for velocity-head reading and the other for orifice differential pressure readings.

3.5.4.1.5 Impingers: The sampling train requires a minimum of four impingers, connected as shown in Figure 3.5-1, with ground glass (or equivalent) vacuum-tight fittings. For the first, third, and fourth impingers, use the Greenburg-Smith design, modified by replacing the tip with a 1.3 cm inside diameter (1/2 in) glass tube extending to 1.3 cm (1/2 in) from the bottom of the flask. For the second impinger, use a Greenburg-Smith Impinger with the standard tip. Place a thermometer capable of measuring temperature to within 1 °C (2 °F) at the outlet of the fourth impinger for monitoring purposes.

3.5.4.1.6 Metering System: The necessary components are a vacuum gauge, leak-free pump, thermometers capable of measuring temperature within 3 °C (5.4 °F), dry-gas meter capable of measuring volume to within 1%, and related equipment as shown in Figure 3.5-1. At a minimum, the pump should be capable of 4 cfm free flow, and the dry gas meter should have a recording capacity of 0-999.9 cu ft with a resolution of 0.005 cu ft. Other metering systems may be used which are capable of maintaining sample volumes to within 2%. The metering system may be used in conjunction with a pitot tube to enable checks of isokinetic sampling rates.

3.5.4.1.7 Barometer: The barometer may be 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) is requested and an adjustment for elevation differences between the weather station and sampling point is applied at a rate of minus 2.5 mm Hg (0.1 in Hg) per 30 m (100 ft) elevation increases (vice versa for elevation decreases).

3.5.4.1.8 Gas Density Determination Equipment: Temperature sensor and pressure gauge (as described in sections 2.3 and 2.3 of EPA method 2), and gas analyzer, if necessary (as described in EPA method 3). The temperature sensor ideally should be permanently attached to the pitot tube or sampling probe in a fixed configuration such that the tip of the sensor extends beyond the leading edge of the probe sheath and does not touch any metal. Alternatively, the sensor may be attached just prior to use in the field. Note, however, that if the temperature sensor is attached in the field, the sensor must be placed in an interference-free arrangement with respect to the Type S pitot

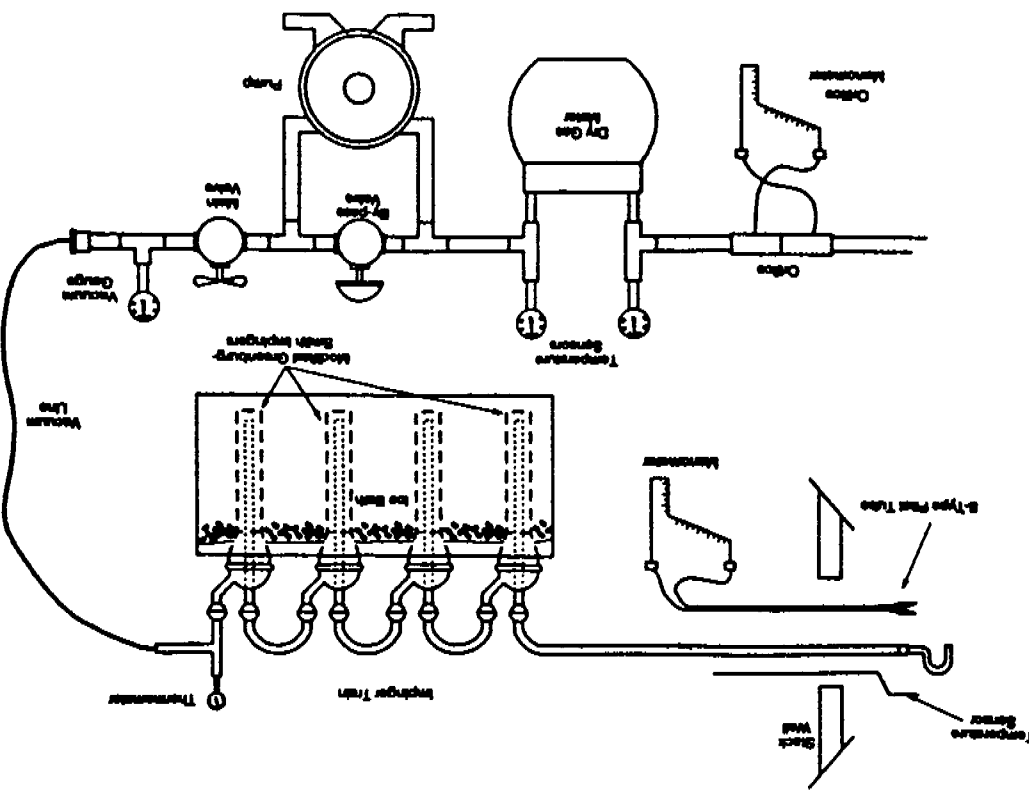


Figure 3.5-1
Formaldehyde Sampling Train

openings (see EPA method 2, Figure 2-7). As a second alternative, if a difference of no more than 1% in the average velocity measurement is to be introduced, the temperature gauge need not be attached to the probe or pitot tube.

3.5.4.2 Sample Recovery.

3.5.4.2.1 Probe Liner: Probe nozzle and brushes: Teflon bristle brushes with stainless steel wire handles are required. The probe brush shall have extensions of stainless steel, Teflon, or inert material at least as long as the probe. The brushes shall be properly sized and shaped to brush out the probe liner, the probe nozzle, and the impingers.

3.5.4.2.2 Wash Bottles: Three wash bottles are required. Teflon or glass wash bottles are recommended; polyethylene wash bottles should not be used because organic contaminants may be extracted by exposure to organic solvents used for sample recovery.

3.5.4.2.3 Graduate Cylinder and/or Balance: A graduated cylinder or balance is required to measure condensed water to the nearest 1 ml or 1 g. Graduated cylinders shall have division not >2 ml. Laboratory balances capable of weighing to 0.5 g are required.

3.5.4.2.4 Amber Glass Storage Containers: One-liter wide-mouth amber flint glass bottles with Teflon-lined caps are required to store impinger water samples. The bottles must be sealed with Teflon tape.

3.5.4.2.5 Rubber Policeman and Funnel: A rubber policeman and funnel are required to aid in the transfer of material into and out of containers in the field.

3.5.4.3 Reagent Preparation.

3.5.4.3.1 Bottles/Caps: Amber 1- or 4-L bottles with Teflon-lined caps are required for storing cleaned DNPH solution. Additional 4-L bottles are required to collect waste organic solvents.

3.5.4.3.2 Large Glass Container: At least one large glass (8 to 16 L) is required for mixing the aqueous acidic DNPH solution.

3.5.4.3.3 Stir Plate/Large Stir Bar/Stir Bar Retriever: A magnetic stir plate and large stir bar are required for the mixing of aqueous acidic DNPH solution. A stir bar retriever is needed for removing the stir bar from the large container holding the DNPH solution.

3.5.4.3.4 Buchner Filter/Filter Flask/Filter Paper: A large filter flask (2-4 L) with a buchner filter, appropriate rubber stopper, filter paper, and connecting tubing are required for filtering the aqueous acidic DNPH solution prior to cleaning.

3.5.4.3.5 Separatory Funnel: At least one large separatory funnel (2 L) is required for cleaning the DNPH prior to use.

3.5.4.3.6 Beakers: Beakers (150 ml, 250 ml, and 400 ml) are useful for holding/measuring organic liquids when cleaning the aqueous acidic DNPH solution and for weighing DNPH crystals.

3.5.4.3.7 Funnels: At least one large funnel is needed for pouring the aqueous acidic DNPH into the separator funnel.

3.5.4.3.8 Graduated Cylinders: At least one large graduated cylinder (1 to 2 L) is required for measuring organic-free reagent water and acid when preparing the DNPH solution.

3.5.4.3.9 Top-Loading Balance: A one-place top loading balance is needed for weighing the DNPH crystals used to prepare the aqueous acidic DNPH solution.

3.5.4.3.10 Spatulas: Spatulas are needed for weighing out DNPH when preparing the aqueous DNPH solution.

3.5.4.4 Crushed Ice: Quantities ranging from 10-50 lb may be necessary during a sampling run, depending upon ambient temperature. Samples which have been taken must be stored and shipped cold; sufficient ice for this purpose must be allowed.

3.5.5 Reagents

3.5.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.5.5.2 Organic-free reagent water: All references to water in this method refer to organic-free reagent water, as defined in Chapter One.

3.5.5.3 Silica Gel: Silica gel shall be indicated type, 6-16 mesh. If the silica gel has been used previously, dry at 175°C (350°F) for 2 hours before using. New silica gel may be used as received. Alternatively, other types of desiccants (equivalent or better) may be used.

3.5.5.4 2,4-dinitrophenylhydrazine (DNPH), $[2,4-(\text{O}_2\text{N})_2\text{C}_6\text{H}_3\text{NHNH}_2]$: The quantity of water may vary from 10 to 30%.

3.5.5.4.1 The 2,4-dinitrophenylhydrazine reagent must be prepared in the laboratory within five days of sampling use in the field. Preparation of DNPH can also be done in the field, with consideration of appropriate procedures required for safe handling of solvent in the field. When a container of prepared DNPH reagent is opened in the field, the contents of the opened container should be used within 48 hours. All laboratory glassware must be washed with detergent and water and rinsed with water, methanol, and methylene chloride prior to use.

NOTE: DNPH crystals or DNPH solution should be handled with plastic gloves at all times with prompt and extensive use of running water in case of skin exposure.

3.5.5.4.2 Preparation of Aqueous Acidic DNPH Derivatizing Reagent: Each batch of

DNPH reagent should be prepared and purified within five days of sampling, according to the procedures described below.

NOTE: Reagent bottles for storage of cleaned DNPH derivatizing solution must be rinsed with acetonitrile and dried before use. Baked glassware is not essential for preparation of DNPH reagent. The glassware must not be rinsed with acetone or an unacceptable concentration of acetone contamination will be introduced. If field preparation of DNPH is performed, caution must be exercised in avoiding acetone contamination.

3.5.5.4.2.1 Place an 8 L container under a fume hood on a magnetic stirrer. Add a large stir bar and fill the container half full of organic-free reagent water. Save the empty bottle from the organic-free reagent water. Start the stirring bar and adjust the stir rate to be as fast as possible. Using a graduated cylinder, measure 1.4 ml of concentrated hydrochloric acid. Slowly pour the acid into the stirring water. Fumes may be generated and the water may become warm. Weight the DNPH crystals on a one-place balance (see Table 3.5-1 for approximate amounts) and add to the stirring acid solution. Fill the 8-L container to the 8-L mark with organic-free reagent water and stir overnight. If all of the DNPH crystals have dissolved overnight, add additional DNPH and stir for two more hours. Continue the process of adding DNPH with additional stirring until a saturated solution has been formed. Filter the DNPH solution using vacuum filtration. Gravity filtration may be used, but a much longer time is required. Store the filtered solution in an amber bottle at room temperature.

3.5.5.4.2.2 Within five days of proposed use, place about 1.6 L of the DNPH reagent in a 2-L separatory funnel. Add approximately 200 ml of methylene chloride and stopper the funnel. Wrap the stopper of the funnel with paper towels to absorb any leakage. Invert and vent the funnel. Then shake vigorously for 3 minutes. Initially, the funnel should be vented frequently (every 10-15 sec). After the layers have separated, discard the lower (organic) layer.

3.5.5.4.2.3 Extract the DNPH a second time with methylene chloride and finally with cyclohexane. When the cyclohexane layer has separated from the DNPH reagent, the cyclohexane layer will be the top layer in the separatory funnel. Drain the lower layer (the cleaned extract DNPH reagent solution) into an amber bottle that has been rinsed with acetonitrile and allowed to dry.

3.5.5.4.3 Quality Control: Take two aliquots of the extracted DNPH reagent. The size of the aliquots is dependent upon the exact sampling procedure used, but 100 ml is reasonably representative. To ensure that the background in the reagent is acceptable for field use, analyze one aliquot of the re-

agent according to the procedure of method 8315. Save the other aliquot of aqueous acidic DNPH for use as a method blank when the analysis is performed.

TABLE 3.5-1.—APPROXIMATE AMOUNT OF CRYSTALLINE DNPH USED TO PREPARE A SATURATED SOLUTION

Amount of moisture in DNPH	Weight required per 8 L of solution
10 weight percent	31 g
15 weight percent	33 g
30 weight percent	40 g

TABLE 3.5-2.—INSTRUMENT DETECTION LIMITS AND REAGENT CAPACITY FOR FORMALDEHYDE ANALYSIS¹

Analyte	Detection limit, ppb ²	Reagent capacity, ppmv
Formaldehyde	1.8	66
Acetaldehyde	1.7	70
Acetone	1.5	75
Acetone/Propionaldehyde	1.5	75
Butyraldehyde	1.5	79
Methyl ethyl ketone	1.5	79
Valeraldehyde	1.5	84
Isobutylaldehyde	1.4	84
Hexanaldehyde	1.3	86
Benzaldehyde	1.4	84
o-m-p-Tolualdehyde	1.3	89
Dimethylbenzaldehyde	1.2	93

¹Organized compounds in addition to formaldehyde are included for comparison with formaldehyde; estimation of the methodology to other compounds is possible.
²Detection limits are determined in solvent. These values therefore represent the optimum capability of the methodology.

3.5.5.4.4 Shipment to the Field: Tightly cap the bottle containing extracted DNPH reagent using a Teflon-lined cap. Seal the bottle with Teflon tape. After the bottle is labeled, the bottle may be placed in a friction-top can (paint can or equivalent) containing a 1-2 inch layer of granulated charcoal and stored at ambient temperature until use.

3.5.5.4.4.1 If the DNPH reagent has passed the Quality Control criteria, the reagent may be packaged to meet necessary shipping requirements and sent to the sampling area. If the Quality Control criteria are not met, the reagent solution may be re-extracted or the solution may be re-prepared and the extraction sequence repeated.

3.5.5.4.4.2 If the DNPH reagent is not used in the field within five days of extraction, an aliquot may be taken and analyzed as described in method 8011A. If the reagent meets the Quality Control requirements, the reagent may be used. If the reagent does not meet the Quality Control requirements, the reagent must be discarded and new reagent must be prepared and tested.

3.5.5.4.5 Calculation of Acceptable Concentrations of Impurities in DNPH Reagent: The acceptable impurity concentration (AIC, µg/ml) is calculated from the expected analyte concentration in the sampled gas (EAC, ppbv), the volume of air that will be sampled at standard conditions (SVOL, L), the formula weight of the analyte (FW, g/mol), and the volume of DNPH reagent that will be used in the Impingers (RVOL, ml):

$$\text{AIC} = 0.1 \times (\text{EAC} \times \text{SVOL} \times \text{FW} / 22.4 \times (\text{FW} + 180 \times \text{FW}) / (\text{RVOL} \times 1,000))$$

where:

0.1 is the acceptable contaminant concentration,

22.4 is a factor relating ppbv to g/L,

180 is a factor relating underivatized to derivatized analyte

1,000 is a unit conversion factor.

3.5.5.4.6 Disposal of Excess DNPH Reagent: Excess DNPH reagent may be returned to the laboratory and recycled or treated as aqueous waste for disposal purposes. 2,4-dinitrophenylhydrazine is a flammable solid when dry, so water should not be evaporated from the solution of the reagent.

3.5.5.5 Field Spike Standard Preparation: To prepare a formaldehyde field spiking standard at 4.01 mg/ml, use a 500 µl syringe to transfer 0.5 ml to 37% by weight of formaldehyde (401 mg/ml) to a 50 ml volumetric flask containing approximately 50 ml of methanol. Dilute to 50 ml with methanol.

3.5.5.6 Hydrochloric Acid, HCL: Reagent grade hydrochloric acid (approximately 12N) is required for acidifying the aqueous DNPH solution.

3.5.5.7 Methylene Chloride, CH_2Cl_2 : Methylene chloride (suitable for residue and pesticide analysis, GC/MS, HPLC, GC, Spectrophotometry or equivalent) is required for cleaning the aqueous acidic DNPH sample trains.

3.5.5.8 Cyclohexane, C_6H_{12} : Cyclohexane (HPLC grade) is required for cleaning the aqueous acidic DNPH solution.

NOTE: Do not use spectroanalyzed grades of cyclohexane if this sampling methodology is extended to aldehydes and ketones with four or more carbon atoms.

3.5.5.9 Methanol, CH_3OH : Methanol (HPLC grade or equivalent) is required for rinsing glassware.

3.5.5.10 Acetonitrile, CH_3CN : Acetonitrile (HPLC grade or equivalent) is required for rinsing glassware.

3.5.5.11 Formaldehyde, HCHO : Analytical grade or equivalent formaldehyde is required for preparation of standards. If other aldehydes or ketones are used, analytical grade or equivalent is required.

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3.5.6 Sample Collection, Preservation, and Handling

3.5.6.1 Because of the complexity of this method, field personnel should be trained in and experienced with the test procedures in order to obtain reliable results.

3.5.6.2 Laboratory Preparation:

3.5.6.2.1 All the components shall be maintained and calibrated according to the procedure described in APTD-0576, unless otherwise specified.

3.5.6.2.2 Weigh several 200 to 300 g portions of silica gel in airtight containers to the nearest 0.5 g. Record on each container the total weight of the silica gel plus container. As an alternative to preweighing the silica gel, it may instead be weighed directly in the impinger or sampling holder just prior to train assembly.

3.5.6.3 Preliminary Field Determinations:

3.5.6.3.1 Select the sampling site and the minimum number of sampling point according to EPA method 1 or other relevant criteria. Determine the stack pressure, temperature, and range of velocity heads using EPA method 2. A leak-check of the pilot lines according to EPA method 2, section 3.1, must be performed. Determine the stack gas moisture content using EPA Approximation method 4 or its alternatives to establish estimates of isokinetic sampling-rate settings. Determine the stack gas dry molecular weight, as described in EPA method 2, section 3.6. If integrated EPA method 3 sampling is used for molecular weight determination, the integrated bag sample shall be taken simultaneously with, and for the same total length of time as, the sample run.

3.5.6.3.2 Select a nozzle size based on the range of velocity heads so that is not necessary to change the nozzle size in order to maintain isokinetic sampling rates below 28 L/min (1.0 cfm). During the run, do not change the nozzle. Ensure that the proper differential pressure gauge is chosen for the range of velocity heads encountered (see section 2.2 of EPA method 2).

3.5.6.3.3 Select a suitable probe liner and probe length so that all traverse points can be sampled. For large stacks, to reduce the length of the probe, consider sampling from opposite sides of the stack.

3.5.6.3.4 A minimum of 45 ft³ of sample volume is required for the determination of the Destruction and Removal Efficiency (DRE) of formaldehyde from incineration systems (45 ft³ is equivalent to one hour of sampling at 0.75 dscf). Additional sample volume shall be collected as necessitated by the capacity of the DNPH reagent and analytical detection limit constraints. To determine the minimum sample volume required, refer to sample calculations in section 10.

3.5.6.3.5 Determine the total length of sampling time needed to obtain the identified minimum volume by comparing the an-

3.5.6.4.6 Turn on and set the probe heating system at the desired operating temperature. Allow time for the temperature to stabilize.

3.5.6.5 Leak-Check Procedures:

3.5.6.5.1 Pre-test Leak Check:

3.5.6.5.1.1 After the sampling train has been assembled, turn on and set the probe heating system at the desired operating temperature. Allow time for the temperature to stabilize. If a Viton-A O-ring or other leak-free connection is used in assembling the probe nozzle to the probe liner, leak check the train at the sampling site by plugging the nozzle and pulling a 381 mm Hg (15 in Hg) vacuum.

NOTE: A lower vacuum may be used, provided that the lower vacuum is not exceeded during the test.

3.5.6.5.1.2 If an asbestos string is used, do not connect the probe to the train during the leak check. Instead, leak-check the train by first attaching a carbon-filled leak check impinger to the inlet and then plugging the inlet and pulling a 381 mm Hg (15 in Hg) vacuum. (A lower vacuum may be used if this lower vacuum is not exceeded during the test.) Next connect the probe to the train and leak-check at about 25 mm Hg (1 in Hg) vacuum. Alternatively, leak-check the probe with the rest of the sampling train in one step at 381 mm Hg (15 in Hg) vacuum. Leakage rates in excess of (a) 4% of the average sampling rate or (b) >0.00037 m³/min (0.02 cfm) are unacceptable.

3.5.6.5.1.3 The following leak check instructions for the sampling train described in ADPT-0576 and APTD-0581 may be helpful. Start the pump with the fine-adjust valve fully open and coarse-valve completely closed. Partially open the coarse-adjust valve and slowly close the fine-adjust valve until the desired vacuum is reached. Do not reverse direction of the fine-adjust valve, as liquid will back up into the train. If the desired vacuum is exceeded, either perform the leak check at this higher vacuum or end the leak check, as shown below, and start over. 3.5.6.5.1.4 When the leak check is completed, first slowly remove the plug from the inlet to the probe. When the vacuum drops to 127 mm (5 in) Hg or less, immediately close the coarse-adjust valve. Switch off the pump, ing system and reopen the fine-adjust valve. Do not reopen the fine-adjust valve until the coarse-adjust valve has been closed to prevent the liquid in the impingers from being forced backward in the sampling line and silica gel from being entrained backward into the third impinger.

3.5.6.5.2 Leak Checks During Sampling Run:

3.5.6.5.2.1 If, during the sampling run, a component change (i.e., impinger) becomes necessary, a leak check shall be conducted immediately after the interruption of sampling and before the change is made. The

leak check shall be done according to the procedure described in section 3.5.6.5.1, except that it shall be done at a vacuum greater than or equal to the maximum value recorded up to that point in the test. If the leakage rate is found to be no greater than 0.00037 m³/min (0.02 cfm) or 4% of the average sampling rate (whichever is less), the results are acceptable. If a higher leakage rate is obtained, the tester must void the sampling run.

NOTE: Any correction of the sample volume by calculation reduces the integrity of the pollutant concentration data generated and must be avoided.

3.5.6.5.2.2 Immediately after a component change and before sampling is reinitiated, a leak check similar to a pre-test leak check must also be conducted.

3.5.6.5.3 Post-test Leak Check:

3.5.6.5.3.1 A leak check is mandatory at the conclusion of each sampling run. The leak check shall be done with the same procedures as the pre-test leak check, except that the post-test leak check shall be conducted at a vacuum greater than or equal to the maximum value reached during the sampling run. If the leakage rate is found to be no greater than 0.00037 m³/min (0.02 cfm) or 4% of the average sampling rate (whichever is less), the results are acceptable. If, however, a higher leakage rate is obtained, the tester shall record the leakage rate and void the sampling run.

3.5.6.6 Sampling Train Operation:

3.5.6.6.1 During the sampling run, maintain an isokinetic sampling rate to within 10% of true isokinetic, below 20 L/min (1.0 cfm). Maintain a temperature around the probe of 120 °C (248 °F ± 25 °F).

3.5.6.6.2 For each run, record the data on a data sheet such as the one shown in Figure 3.5-2. Be sure to record the initial dry-gas meter reading. Record the dry-gas meter readings at the beginning and end of each sampling time increment, when changes in flow rates are made, before and after each leak check, and when sampling is halted. Take other readings required by Figure 2 at least once at each sample point during each time increment and additional readings when significant adjustments (20% variation in velocity head readings) necessitate additional adjustments in flow rate. Level and zero the manometer. Because the manometer level and zero may drift due to vibrations and temperature changes, make periodic checks during the traverse.

3.5.6.6.3 Clean the stack access ports prior to the test run to eliminate the change of sampling deposited material. To begin sampling, remove the nozzle cap, verify that the specified temperature, and verify that the pilot tube and probe are properly positioned. Position the nozzle at the first traverse

3.5.6.6.4 When the stack is under significant negative pressure (equivalent to the height of the impinger stem), take care to close the coarse-adjust valve before inserting the probe into the stack in order to prevent liquid from backing up through the train. If necessary, the pump may be turned on with the coarse-adjust valve closed.

3.5.6.6.5 When the probe is in position, block off the openings around the probe and stack access port to prevent unrepresentative dilution of the gas stream.

3.5.6.6.6 Traverse the stack cross section, as required by EPA Method 1, being careful not to bump the probe nozzle into the stack walls when sampling near the walls or when removing or inserting the probe through the access port, in order to minimize the chance of extracting deposited material.

3.5.6.6.7 During the test run, make periodic adjustments to keep the temperature around the probe at the proper levels. Add more ice and, if necessary, salt, to maintain a temperature of $>20^{\circ}\text{C}$ (68°F) at the silica gel outlet. Also, periodically check the level and zero of the manometer.

3.5.6.6.8 A single train shall be used for the entire sampling run, except in cases where simultaneous sampling is required in two or more separate ducts or at two or more different locations within the same duct, or in cases where equipment failure necessitates a change of trains. An additional train or additional trains may also be used for sampling when the capacity of a single train is exceeded.

3.5.6.6.9 When two or more trains are used, separate analyses of components from each train shall be performed. If multiple trains have been used because the capacity of a single train would be exceeded, first impingers from each train may be combined, and second impingers from each train may be combined.

3.5.6.6.10 At the end of the sampling run, turn off the coarse-adjust valve, remove the probe and nozzle from the stack, turn off the pump, record the final dry gas meter reading, and conduct a post-test leak check. Also, leak check the pilot lines as described in EPA method 2. The lines must pass this leak check in order to validate the velocity-head data.

3.5.6.6.11 Calculate percent leakiness (see method 2) to determine whether the run was valid or another test should be made.

3.5.7 Sample Recovery

3.5.7.1 Preparation.

3.5.7.1.1 Proper cleanup procedure begins as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool. When the probe can be handled safely, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over the tip to prevent losing or gaining particulate matter. Do not

ethylene) to aid in transferring the liquid washes to the container. Follow the rinse with a Teflon brush. Hold the probe in an inclined position, and squirt methylene chloride into the upper end as the probe brush is being pushed with a twisting action through the probe. Hold the sample container underneath the lower end of the probe, and catch any methylene chloride, water, and particulate matter that is brushed from the probe. Run the brush through the probe three times or more. With stainless steel or other metal probes, run the brush through in the above prescribed manner at least six times since there may be small crevices in which particulate matter can be entrapped. Rinse the brush with methylene chloride or water, and quantitatively collect these washings in the sample container. After the brushing, make a final rinse of the probe as described above.

NOTE: Two people should clean the probe in order to minimize sample losses. Between sampling runs, brushes must be kept clean and free from contamination.

3.5.7.2.1.3 Rinse the inside surface of each of the first three impingers (and connecting tubing) three separate times. Use a small portion of methylene chloride for each rinse, and brush each surface to which the sample is exposed with a Teflon bristle brush to ensure recovery of fine particulate matter.

Water will be required for the recovery of the impingers in addition to the specified quantity of methylene chloride. There will be at least two phases in the impingers. This two-phase mixture does not pour well, and a significant amount of the impinger catch will be left on the walls. The use of water as a rinse makes the recovery quantitative. Make a final rinse of each surface and of the brush, using both methylene chloride and water.

3.5.7.2.1.4 After all methylene chloride and water washing and particulate matter have been collected in the sample container, tighten the lid so the solvent, water, and DNPH reagent will not leak out when the container is shipped to the laboratory. Mark the height of the fluid level to determine whether leakage occurs during transport. Seal the container with Teflon tape. Label the container clearly to identify its contents.

3.5.7.2.1.5 If the first two impingers are to be analyzed separately to check for breakthrough, separate the contents and rinses of the two impingers into individual containers. Care must be taken to avoid physical carryover from the first impinger to the second. The formaldehyde hydrazine is a solid which floats and froths on top of the impinger solution. Any physical carryover of collected moisture into the second impinger will invalidate a breakthrough assessment.

3.5.7.2.2 Container 2: Sample Blank. Prepare a blank by using an amber flint glass container and adding a volume of DNPH re-

gent and methylene chloride equal to the total volume in Container 1. Process the blank in the same manner as Container 1.

3.5.7.2.3 Container 3: Silica Gel. Note the color of the indicating silica gel to determine whether it has been completely spent and make a notation of its condition. The impinger containing the silica gel may be used as a sample transport container with both ends sealed with tightly fitting caps or plugs. Ground-glass stoppers or Teflon caps may be used. The silica gel impinger should then be labeled, covered with aluminum foil, and packaged on ice for transport to the laboratory. If the silica gel is removed from the impinger, the tester may use a funnel to pour the silica gel and a rubber policeman to remove the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere to the impinger wall and are difficult to remove. Since the gain in weight is to be used for moisture calculations, do not use water or other liquids to transfer the silica gel. If a balance is available in the field, the spent silica gel (or silica gel plus impinger) may be weighed to the nearest 0.5 g.

3.5.7.2.4 Sample containers should be placed in a cooler, cooled by (although not in contact with) ice. Sample containers must be placed vertically and, since they are glass, protected from breakage during shipment. Samples should be cooled during shipment so they will be received cold at the laboratory.

3.5.8 Calibration

3.5.8.1 Probe Nozzle: Probe nozzles shall be calibrated before their initial use in the field. Using a micrometer, measure the inside diameter of the nozzle to the nearest 0.025 mm (0.001 in). Make measurements at three separate places across the diameter and obtain the average of the measurements. The difference between the high and low numbers shall not exceed 0.1 mm (0.004 in). When the nozzles become nicked or corroded, they shall be replaced and calibrated before use. Each nozzle must be permanently and uniquely identified.

3.5.8.2 Pilot Tube: The Type S pilot tube assembly shall be calibrated according to the procedure outlined in Section 4 of EPA Method 2 or assigned a nominal coefficient of 0.84 if it is not visibly nicked or corroded and if it meets design and intercomponent specification.

3.5.8.3 Metering System.

3.5.8.3.1 Before its initial use in the field, the metering system shall be calibrated according to the procedure outlined in APTD-0876. Instead of physically adjusting the dry-gas meter dial readings to correspond to the wet-test meter readings, calibration factors may be used to correct the gas meter dial readings mathematically to the proper values. Before calibrating the metering system, it is suggested that a leak check be con-

ducted. For metering systems having diaphragm pumps, the normal leak check procedure will not detect leakages with the pump. For these cases, the following leak check procedure will apply: make a ten-minute calibration run at 0.0057 m³/min (0.02 cfm). At the end of the run, take the difference of the measured wettest and dry-gas meter volumes and divide the difference by 10 to get the leak rate. The leak rate should not exceed 0.0057 m³/min (0.02 cfm).

3.5.8.3.2 After each field use, check the calibration of the metering system by performing three calibration runs at a single intermediate orifice setting (based on the previous field test). Set the vacuum at the maximum value reached during the test series. To adjust the vacuum, insert a valve between the wet-test meter and the inlet of the metering system. Calculate the average value of the calibration factor. If the calibration has changed by more than 5%, recalibrate the meter over the full range of orifice settings as outlined in APTD-0576.

3.5.8.3.3 Leak check of metering system: The portion of the sampling train from the pump to the orifice meter (see Figure 1) should be leak checked prior to initial use and after each shipment. Leakage after the pump will result in less volume being recorded than is actually sampled. Use the following procedure: Close the main valve on the meter box. Insert a one-hole rubber stopper with rubber tubing attached into the orifice exhaust pipe. Disconnect and vent the low side of the orifice manometer. Close off the low side orifice tap. Pressurize the system to 15-18 cm (5-7 in) water column by blowing into the rubber tubing. Pinch off the tubing and observe the manometer for 1 min. A loss of pressure on the manometer indicates a leak in the meter box. Leaks must be corrected.

NOTE: If the dry-gas-meter coefficient values obtained before and after a test series differ by >5%, either the test series must be voided or calculations for test series must be performed using whichever meter coefficient value (i.e., before or after) gives the lower value of total sample volume.

3.5.8.4 Probe Heater: The probe heating system must be calibrated before its initial use in the field according to the procedure outlined in APTD-0576. Probes constructed according to APTD-0581 need not be calibrated if the calibration curves in APTD-0576 are used.

3.5.8.5 Temperature gauges: Each thermocouple must be permanently and uniquely marked on the casing. All mercury-in-glass reference thermometers must conform to ASTM E-1 63C or 63F specifications. Thermocouples should be calibrated in the laboratory with and without the use of extension leads. If extension leads are used in the field, the thermocouple readings at the

ambient air temperatures, with and without the extension lead, must be noted and recorded. Correction is necessary if the use of an extension lead produces a change >1.5%.

3.5.8.5.1 Impinger and dry-gas meter thermocouples: For the thermocouples used to measure the temperature of the gas leaving the impinger train, three-point calibration at ice water, room air, and boiling water temperatures is necessary. Accept the thermocouples only if the readings at all three temperatures agree to $\pm 0.3^\circ\text{C}$ ($\pm 0.5^\circ\text{F}$) with those of the absolute value of the reference thermometer.

3.5.8.5.2 Probe and stack thermocouple: For the thermocouples used to indicate the probe and stack temperatures, a three-point calibration at ice water, boiling water, and hot oil bath temperatures must be performed. Use of a point at room air temperature is recommended. The thermometer and thermocouple must agree to within 1.5% at each of the calibration points. A calibration curve (equation) may be constructed to calculate the data extrapolated to cover the entire temperature range suggested by the manufacturer.

3.5.8.6 Barometer: Adjust the barometer initially and before each test series to agree to within ± 2.5 mm Hg (0.1 in Hg) of the mercury barometer or the correct barometric pressure value reported by a nearby National Weather Service Station (same altitude above sea level).

3.5.8.7 Triple-beam balance: Calibrate the triple-beam balance before each test series, using Class 8 standard weights. The weights must be within $\pm 0.5\%$ of the standards, or the balance must be adjusted to meet these limits.

3.5.9 Calculations

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

3.5.9.1 Calculation of Total Formaldehyde: To determine the total formaldehyde in mg, use the following equation:

$$\text{Total mg formaldehyde} = C_m \times V \times DF \times \frac{[\text{gmole aldehyde}]}{[\text{gmole DNPH derivative}]} \times 10^3 \frac{\text{mg}}{\mu\text{g}}$$

where:

C_m = measured concentration of DNPH - formaldehyde derivative, $\mu\text{g/ml}$.
 V = organic extract volume ml.
 DF = dilution factor.

3.5.9.2 Formaldehyde concentration in stack gas.

Determine the formaldehyde concentration in the stack gas using the following equation:

$$C_p - K [\text{total formaldehyde, mg}] V_{m(\text{air})}$$

where:

$K = 35.31 \text{ ft}^3/\text{m}^3$ if $V_{m(\text{air})}$ is expressed in English units

$= 1.00 \text{ m}^3/\text{m}^3$ if $V_{m(\text{air})}$ is expressed in metric units.

$V_{m(\text{air})}$ = volume of gas sample as measured by dry gas meter, corrected to standard conditions, decm (decf).

3.5.9.3 Average Dry Gas Meter Temperature and Average Orifice Pressure Drop are obtained from the data sheet.

3.5.9.4 Dry Gas Volume: Calculate $V_{m(\text{air})}$ and adjust for leakage, if necessary, using the equation in section 6.3 of EPA method 5.

3.5.9.5 Volume of Water Vapor and Moisture Content: Calculate the volume of water vapor and moisture content from equations 6-2 and 5-3 of EPA method 5.

3.5.10 Determination of Volume to be Sampled To determine the minimum sample volume to be collected, use the following sequence of equations.

3.5.10.1 From prior analysis of the waste feed, the concentration of formaldehyde (FORM) introduced into the combustion system can be calculated. The degree of destruction and removal efficiency that is required is used to determine the amount of FORM allowed to be present in the effluent. This amount may be expressed as:

$$\text{Max FORM Mass} = \left(\frac{WF}{100 - \%DRE} \right) / 100 \quad (\text{FORM conc})$$

where:

WF = mass flow rate of waste feed per h, g/h (lb/h).

FORM = concentration of FORM (wt %) introduced into the combustion process.

DRE = percent Destruction and Removal Efficiency required.

Max FORM = mass flow rate (g/h (lb/h)) of FORM emitted from the combustion sources.

3.5.10.2 The average discharge concentration of the FORM in the effluent gas is determined by comparing the Max FORM with the volumetric flow rate being exhausted from the source. Volumetric flow rate data are available as a result of preliminary EPA method 1-4 determinations:

$$\text{Max FORM conc} = (\text{Max FORM Mass}) / (DV_{m(\text{air})})$$

where:

$DV_{m(\text{air})}$ = volumetric flow rate of exhaust gas, decm (decf).

FORM conc = anticipated concentration of the FORM in the exhaust gas stream, g/dec (lb/dec).

3.5.10.3 In making this calculation, it is recommended that a safety margin of at least ten be included.

$$[LDL_{\text{FORM}} \times 10 / \text{FORM conc}] V_{m(\text{air})}$$

where:

LDL_{FORM} = detectable amount of FORM in entire sampling train.

$V_{m(\text{air})}$ = minimum dry standard volume to be collected at dry-gas meter.

3.5.10.4 The following analytical detection limits and DNPH Reagent Capacity (based on a total volume of 200 ml in two impingers) must also be considered in determining a volume to be sampled.

3.5.11 Quality Control

3.5.11.1 Sampling: See EPA Manual 600/4-77-02b for Method 5 quality control.

3.5.11.2 Analysis: The quality assurance program required for this method includes the analysis of the field and method blanks, procedure validations, and analysis of field spikes. The assessment of combustion data and positive identification and quantization of formaldehyde are dependent on the integrity of the samples received and the precision and accuracy of the analytical methodology. Quality assurance procedures for this method are designed to monitor the performance of the analytical methodology and to provide the required information to take corrective action if problems are observed in laboratory operations or in field sampling activities.

3.5.11.2.1 Field Blanks: Field blanks must be submitted with the samples collected at each sampling site. The field blanks include the sample bottles containing aliquots of sample recovery solvents, methylene chloride and water, and unused DNPH reagent. At a minimum, one complete sampling train will be assembled in the field staging area, taken to the sampling area, and leak-checked at the beginning and end of the testing (or for the same total number of times as the actual sampling train). The probe of the blank train must be heated during the sample test. The train will be recovered as if it were an actual test sample. No gaseous sample will be passed through the blank sampling train.

3.5.11.2.2 Method Blanks: A method blank must be prepared for each set of analytical operations, to evaluate contamination and artifacts that can be derived from glassware, reagents, and sample handling in the laboratory.

3.5.11.2.3 Field Spike: A field spike is performed by introducing 200 μL of the Field Spike Standard into an impinger containing 200 ml of DNPH solution. Standard impinger recovery procedures are followed and the spike is used as a check on field handling and recovery procedures. An aliquot of the field spike standard is retained in the laboratory for derivatization and comparative analysis.

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3.5.12 Method Performance

3.5.12.1 Method performance evaluation: The expected method performance parameters for precision, accuracy, and detection limits are provided in Table 3.5-3.

Addition of a Filter to the Formaldehyde Sampling Train

As a check on the survival of particulate material through the impinger system, a filter can be added to the impinger train either after the second impinger or after the third impinger. Since the impingers are in an ice bath, there is no reason to heat the filter at this point.

Any suitable medium (e.g., paper, organic membrane) may be used for the filter if the material conforms to the following specifications:

(1) The filter has at least 95% collection efficiency (<5% penetration) for 3 µm dioctyl phthalate smoke particles. The filter efficiency test shall be conducted in accordance with ASTM standard method D2886-71. Test data from the supplier's quality control program are sufficient for this purpose.

(2) The filter has a low aldehyde blank value (<0.05 mg formaldehyde/cm² of filter area). Before the test series, determine the average formaldehyde blank value of at least three filters (from the lot to be used for sampling) using the applicable analytical procedures.

TABLE 3.5-3.—EXPECTED METHOD PERFORMANCE FOR FORMALDEHYDE

Parameter	Precision ¹	Accuracy ²	Detection limits ³
Matrix: Dual trains	±15%	±20%	1.5x10 ⁻⁷ kg/m ³ (1.8 ppbv)

¹ Relative percent difference limit for dual trains.

² Limit for field spike recoveries.

³ The lower reporting limit having less than 1% probability of false positive detection.

Recover the exposed filter into a separate clean container and return the container over ice to the laboratory for analysis. If the filter is being analyzed for formaldehyde, the filter may be recovered into a container or DNPH reagent for shipment back to the laboratory. If the filter is being examined for the presence of particulate material, the filter may be recovered into a clean dry container and returned to the laboratory.

3.6 Analysis for Aldehydes and Ketones by High Performance Liquid Chromatography (HPLC) (Method 0011A)

3.6.1 Scope and Application

3.6.1.1 Method 0011A covers the determination of free formaldehyde in the aqueous samples and leachates and derived aldehydes/ketones collected by method 0011.

3.6.1.5 This method is restricted to use by, or under the supervision of, analysts experienced in the use of chromatography and in the interpretation of chromatograms. Each analyst must demonstrate the ability to generate acceptable results with this method.

3.6.1.6 The toxicity or carcinogenicity of each reagent used in this method has not been precisely defined; however, each chemical compound should be treated as a potential health hazard. From this viewpoint, exposure to these chemicals must be reduced to the lowest possible level by whatever means available. The laboratory is responsible for maintaining a current awareness file of OSHA regulations regarding the safe handling of the chemicals specified in this method. A reference file of material safety data sheets should also be made available to all personnel involved in the chemical analysis. Additional references to laboratory safety are available.

3.6.1.7 Formaldehyde has been tentatively classified as a known or suspected, human or mammalian carcinogen.

3.6.2 Summary of Method

3.6.2.1 Environmental Liquids and Solid Leachates.

3.6.2.1.1 For wastes comprised of solids or for aqueous wastes containing significant amounts of solid material, the aqueous phase, if any, is separated from the solid phase and stored for later analysis. If necessary, the particle size of the solids in the waste is reduced. The solid phase is extracted with an amount of extraction fluid equal to 20 times the weight of the solid phase of the waste. A special extractor vessel is used when testing for volatiles. Following extraction, the aqueous extract is separated from the solid phase by filtration employing 0.6 to 0.8 µm glass fiber filters.

3.6.2.1.2 If compatible (i.e., multiple phases will not form on combination), the initial aqueous phase of the waste is added to the aqueous extract, and these liquids are analyzed together. If incompatible, the liquids are analyzed separately and the results are mathematically combined to yield a volume weighted average concentration.

3.6.2.1.3 A measured volume of aqueous sample or an appropriate amount of solids leachate is buffered to pH 5 and derivatized with 2,4-dinitrophenylhydrazine (DNPH), using either the solid sorbent or the methylene chloride sorbent option. If the solid sorbent option is used, the derivative is extracted using solid sorbent cartridges, followed by elution with ethanol. If the methylene chloride option is used, the derivative is extracted with methylene chloride. The methylene chloride extracts are concentrated using the Kuderna-Danish (K-D) procedure and solvent exchanged into methanol prior to HPLC analysis. Liquid chromatographic conditions are described

which permit the separation and measurement of formaldehyde in the extract by absorbance detection at 360 nm.

3.6.2.2 Stack Gas Samples Collected by Method 0011.

3.6.2.2.1 The entire sample returned to the laboratory is extracted with methylene chloride and the methylene chloride extract is brought up to a known volume. An aliquot of the methylene chloride extract is solvent exchanged and concentrated or diluted as necessary.

3.6.2.2.2 Liquid chromatographic conditions are described that permit the separation and measurement of formaldehyde in the extract by absorbance detection at 360 nm.

3.6.3 Interferences

3.6.3.1 Method Interferences may be caused by contaminants in solvents, reagents, glassware, and other sample processing hardware that lead to discrete artifacts and/or elevated baselines in the chromatograms. All of these materials must be routinely demonstrated to be free from interferences under the conditions of the analysis by analyzing laboratory reagent blanks.

3.6.3.1.1 Glassware must be scrupulously cleaned. Clean all glassware as soon as possible after use by rinsing with the last solvent used. This should be followed by detergent washing with hot water, and rinses with tap water and distilled water. It should then be drained, dried, and heated in a laboratory oven at 130°C for several hours before use. Solvent rinses with methanol may be substituted for the oven heating. After drying and cooling, glassware should be stored in a clean environment to prevent any accumulation of dust or other contaminants.

3.6.3.1.2 The use of high purity reagents and solvents helps to minimize interference problems. Purification of solvents by distillation in all-glass systems may be required.

3.6.3.2 Analysis for formaldehyde is especially complicated by its ubiquitous occurrence in the environment.

3.6.3.3 Matrix interferences may be caused by contaminants that are coextracted from the sample. The extent of matrix interferences will vary considerably from source to source, depending upon the nature and diversity of the matrix being sampled. No interferences have been observed in the matrices studied as a result of using solid sorbent extraction as opposed to liquid extraction. If interferences occur in subsequent samples, some additional cleanup may be necessary.

3.6.3.4 The extent of interferences that may be encountered using liquid chromatographic techniques has not been fully assessed. Although the HPLC conditions described allow for a resolution of the

specific compounds covered by this method, other matrix components may interfere.

3.6.4 Apparatus and Materials

3.6.4.1 Reaction vessel—250 ml Florence flask.

3.6.4.2 Separatory funnel—205 ml, with Teflon stopcock.

3.6.4.3 Kuderna-Danish (K-D) apparatus.

3.6.4.3.1 Concentrator tube—10 ml graduated (Kontes K-570050-1025 or equivalent). A ground glass stopper is used to prevent evaporation of extract.

3.6.4.3.2 Evaporation flask—500 ml (Kontes K-570001-500 or equivalent). Attach to concentrator tube with springs, clamps, or equivalent.

3.6.4.3.3 Snyder column—Three ball macro (Kontes K-565000-0121 or equivalent).

3.6.4.3.4 Snyder column—Two ball macro (Kontes K-569001-0219 or equivalent).

3.6.4.3.5 Springs— $\frac{1}{8}$ inch (Kontes K-562750 or equivalent).

3.6.4.4 Vials—10, 25 ml, glass with Teflon lined screw caps or crimp tops.

3.6.4.5 Boiling chips—Solvent extracted with methylene chloride, approximately 10/40 mesh (silicone carbide or equivalent).

3.6.4.6 Balance—Analytical, capable of accurately weighing to the nearest 0.0001 g.

3.6.4.7 pH meter—Capable of measuring to the nearest 0.01 units.

3.6.4.8 High performance liquid chromatograph (modular).

3.6.4.8.1 Pumping system—Isocratic, with constant flow control capable of 1.00 ml/min.

3.6.4.8.2 High pressure injection valve with 20 μ l loop.

3.6.4.8.3 Column—250 mm $\times$ 4.6 mm ID, 5 μ m particle size, C18 (or equivalent).

3.6.4.8.4 Absorbance detector—360 nm.

3.6.4.8.5 Strip-chart recorder compatible with detector—Use of a data system for measuring peak areas and retention times is recommended.

3.6.4.9 Glass fiber filter paper.

3.6.4.10 Solid sorbent cartridges—Packed with 500 mg C18 (Baker or equivalent).

3.6.4.11 Vacuum manifold—Capable of simultaneous extraction of up to 12 samples (Supelco or equivalent).

3.6.4.12 Sample reservoir—60 ml capacity (Supelco or equivalent).

3.6.4.13 Pipet—Capable of accurately delivering 0.10 ml solution (Pipetman or equivalent).

3.6.4.14 Water bath—Heated, with concentric ring cover, capable of temperature control ($\pm 2^\circ\text{C}$). The bath should be used under a hood.

3.6.4.15 Volumetric Flasks—250 or 500 ml.

3.6.5 Reagents

3.6.5.1 Reagent grade chemicals shall be used in all tests. Unless otherwise indicated, it is intended that all reagents shall conform

to the specifications of the Committee on Analytical Reagents of the American Chemical Society, where such specifications are available. Other grades may be used, provided it is first ascertained that the reagent is of sufficiently high purity to permit its use without lessening the accuracy of the determination.

3.6.5.2 Organic-free water—All references to water in this method refer to organic-free reagent water, as defined in chapter I SW-946.

3.6.5.3 Methylene chloride, CH_2Cl_2 —HPLC grade or equivalent.

3.6.5.4 Methanol, CH_3OH —HPLC grade or equivalent.

3.6.5.5 Ethanol (absolute), $\text{CH}_3\text{CH}_2\text{OH}$ —HPLC grade or equivalent.

3.6.5.6 2,4-Dinitrophenylhydrazine (DNPH) (70% (W/W)), $[2,4-(\text{O}-\text{N})_2\text{C}_6\text{H}_3\text{NHNH}_2]$, in organic-free reagent water.

3.6.5.7 Formalin (37.5 percent (w/w)), formaldehyde in organic-free reagent water.

3.6.5.8 Acetic acid (glacial), $\text{CH}_3\text{CO}_2\text{H}$.

3.6.5.9 Sodium hydroxide solutions NaOH, 1.0 N and 5 N.

3.6.5.10 Sodium chloride, NaCl.

3.6.5.11 Sodium sulfite solution, Na_2SO_3 , 0.1 M.

3.6.5.12 Hydrochloric Acid, HCl, 0.1 N.

3.6.5.13 Extraction fluid—Dilute 64.3 ml of 1.0 N NaOH and 5.7 ml glacial acetic acid to 900 ml with organic-free reagent water. Dilute to 1 liter with organic-free reagent water. The pH should be 4.93 $\pm$ 0.02.

3.6.5.14 Stock standard solutions.

3.6.5.14.1 Stock formaldehyde (approximately 1.00 mg/ml)—Prepare by diluting 265 μ l formalin to 100 ml with organic-free reagent water.

3.6.5.14.1.1 Standardization of formaldehyde stock solution—Transfer a 25 ml aliquot of a 0.1 M Na_2SO_3 solution to a beaker and record the pH. Add a 25.0 ml aliquot of the formaldehyde stock solution (section 3.6.5.14.1) and record the pH. Titrate this mixture back to the original pH using 0.1 N HCl. The formaldehyde concentration is calculated using the following equation:

Concentration (mg/ml) = $30.03 \times (\text{N HCl}) \times (\text{ml HCl}) \times 25.0$

where:

N HCl = Normality of HCl solution used.

ml HCl = ml of standardized HCl solution used.

30.03 = MW of formaldehyde.

3.6.5.14.2 Stock formaldehyde and acetaldehyde—Prepare by adding 265 μ l formalin and 0.1 g acetaldehyde to 90 ml of water and dilute to 100 ml. The concentration of acetaldehyde in this solution is 1.00 mg/ml. Calculate the concentration of formaldehyde in this solution using the results of the assay performed in section 3.6.5.14.1.1.

3.6.5.14.3 Stock standard solutions must be replaced after six months, or sooner, if

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comparison with check standards indicates a problem.

3.6.5.15 Reaction Solutions.

3.6.5.15.1 DNPH (1.00 $\mu\text{g/L}$)—Dissolve 142.9 mg of 70% (w/w) reagent in 100 ml absolute ethanol. Slight heating or sonication may be necessary to effect dissolution.

3.6.5.15.2 Acetate buffer (5 N) Prepare by neutralizing glacial acetic acid to pH 5 with 6 N NaOH solution. Dilute to standard volume with water.

3.6.5.15.3 Sodium chloride solution (saturated) Prepare by mixing of the reagent grade solid with water.

3.6.6 Sample Collection, Preservation, and Handling

3.6.6.1 See the Introductory material to this Chapter, Organic Analytes, section 4.1 of BW-946.

3.6.6.2 Environmental liquid and leachate samples must be refrigerated at 4°C , and must be derivatized within 5 days of sample collection and analyzed within 3 days of derivatization.

3.6.6.3 Stack gas samples collected by Method 001 must be refrigerated at 4°C . It is recommended that samples be extracted within 30 days of collection and that extracts be analyzed within 30 days of extraction.

3.6.7 Procedure

3.6.7.1 Extraction of Solid Samples.

3.6.7.1.1 All solid samples should be homogeneous. When the sample is not dry, determine the dry weight of the sample, using a representative aliquot.

3.6.7.1.1.1 Determination of dry weight—In certain cases, sample results are desired based on a dry weight basis. When such data is desired, or required, a portion of sample for dry weight determination should be weighed out at the same time as the portion used for analytical determination.

WARNING: The drying oven should be contained in a hood or vented. Significant laboratory contamination may result from drying a heavily contaminated hazardous waste sample.

TABLE 3.6-3.—SINGLE OPERATOR ACCURACY AND PRECISION USING SOLID SORBENT EXTRACTION

3.6.7.2.2 If the sample is not clean, or the complexity is unknown, the entire sample should be centrifuged at 2500 rpm for 10 minutes. Decant the supernatant liquid from the centrifuge bottle, and filter through glass fiber filter paper into a container which can be tightly sealed.

3.6.7.3 Derivatization.

3.6.7.3.1 For aqueous samples, measure a 50 to 100 ml aliquot of the sample. Quantitatively transfer the sample aliquot to the reaction vessel (section 3.6.4.1).

3.6.7.3.2 For solid samples, 1 to 10 ml of leachate (section 3.6.7.1) will usually be required. The amount used for a particular sample must be determined through preliminary experiments.

3.6.7.3.3 Derivatization and extraction of the derivative can be accomplished using the solid sorbent (section 3.6.7.3.4) or methylene chloride option (section 3.6.7.3.5).

3.6.7.3.4 Solid Sorbent Option.

3.6.7.3.5 Solid Sorbent Option.

3.6.7.3.6 Solid Sorbent Option.

3.6.7.3.7 Solid Sorbent Option.

3.6.7.3.8 Solid Sorbent Option.

3.6.7.3.9 Solid Sorbent Option.

3.6.7.3.10 Solid Sorbent Option.

3.6.7.3.11 Solid Sorbent Option.

3.6.7.3.12 Solid Sorbent Option.

3.6.7.3.13 Solid Sorbent Option.

3.6.7.3.14 Solid Sorbent Option.

3.6.7.3.15 Solid Sorbent Option.

3.6.7.3.16 Solid Sorbent Option.

3.6.7.3.17 Solid Sorbent Option.

3.6.7.3.18 Solid Sorbent Option.

3.6.7.3.19 Solid Sorbent Option.

3.6.7.3.20 Solid Sorbent Option.

3.6.7.1.1.2 Immediately after weighing the sample for extraction, weigh 5-10 g of the sample into a tared crucible. Determine the % dry weight of the sample by drying overnight at 105°C . Allow to cool in a desiccator before weighing:

$$\% \text{ dry weight} = \frac{\text{g of dry sample}}{\text{g of sample}} \times 100$$

3.6.7.1.2 Measure 25 g of solid into a 500 ml bottle with a Teflon lined screw cap or crimp top, and add 500 ml of extraction fluid (section 3.6.5.13). Extract the solid by rotating the bottle at approximately 30 rpm for 16 hours. Filter the extract through glass fiber paper and store in sealed bottles at 4°C . Each ml of extract represents 0.050 g solid.

3.6.7.2 Cleanup and Separation.

3.6.7.2.1 Cleanup procedures may not be necessary for a relatively clean sample matrix. The cleanup procedures recommended in this method have been used for the analysis of various sample types. If particular circumstances demand the use of an alternative cleanup procedure, the analyst must determine the elution profile and demonstrate that the recovery of formaldehyde is no less than 85% of recoveries specified in Table 3.6-3. Recovery may be lower for samples which form emulsions.

3.6.7.2.2 If the sample is not clean, or the complexity is unknown, the entire sample should be centrifuged at 2500 rpm for 10 minutes. Decant the supernatant liquid from the centrifuge bottle, and filter through glass fiber filter paper into a container which can be tightly sealed.

3.6.7.3 Derivatization.

3.6.7.3.1 For aqueous samples, measure a 50 to 100 ml aliquot of the sample. Quantitatively transfer the sample aliquot to the reaction vessel (section 3.6.4.1).

3.6.7.3.2 For solid samples, 1 to 10 ml of leachate (section 3.6.7.1) will usually be required. The amount used for a particular sample must be determined through preliminary experiments.

3.6.7.3.3 Derivatization and extraction of the derivative can be accomplished using the solid sorbent (section 3.6.7.3.4) or methylene chloride option (section 3.6.7.3.5).

3.6.7.3.4 Solid Sorbent Option.

3.6.7.3.5 Solid Sorbent Option.

3.6.7.3.6 Solid Sorbent Option.

3.6.7.3.7 Solid Sorbent Option.

3.6.7.3.8 Solid Sorbent Option.

3.6.7.3.9 Solid Sorbent Option.

3.6.7.3.10 Solid Sorbent Option.

3.6.7.3.11 Solid Sorbent Option.

3.6.7.3.12 Solid Sorbent Option.

3.6.7.3.13 Solid Sorbent Option.

3.6.7.3.14 Solid Sorbent Option.

3.6.7.3.15 Solid Sorbent Option.

3.6.7.3.16 Solid Sorbent Option.

3.6.7.3.17 Solid Sorbent Option.

3.6.7.3.18 Solid Sorbent Option.

3.6.7.3.19 Solid Sorbent Option.

3.6.7.3.20 Solid Sorbent Option.

TABLE 3.6-3.—SINGLE OPERATOR ACCURACY AND PRECISION USING SOLID SORBENT EXTRACTION

Analyte	Matrix type	Average percent recovery	Standard deviation percent	Spike range ($\mu\text{g/L}$)	No. of analyses
Formaldehyde	Reagent water	86	8.4	15-1430	39
	Final effluent	90	11.0	46.8-1430	16
	Preind formaldehyde sludge	93	12.0	46.7-1430	15

NOTE: For all reactions, the total volume of the aqueous layer should be adjusted to 100 ml with water.

3.6.7.3.3 Derivatization and extraction of the derivative can be accomplished using the solid sorbent (section 3.6.7.3.4) or methylene chloride option (section 3.6.7.3.5).

3.6.7.3.4 Solid Sorbent Option.

3.6.7.3.4.1 Add 4 ml of acetate buffer and adjust the pH to 5.0±0.1 with glacial acetic acid or 5 N NaOH. Add 6 ml of DNPH reagent, seal the container, and place on a wrist-action shaker for 30 minutes.

3.6.7.3.4.2 Assemble the vacuum manifold and connect to a water aspirator or vacuum pump. Assemble solid sorbent cartridges containing a minimum of 1.5 g of C18 sorbent, using connectors supplied by the manufacturer, and attach the sorbent train to the vacuum manifold. Condition each cartridge by passing 10 ml dilute acetate buffer (10 ml 6 N acetate buffer dissolved in 250 ml water) through the sorbent cartridge train.

3.6.7.3.4.3 Remove the reaction vessel from the shaker and add 10 ml saturated NaCl solution to the vessel.

3.6.7.3.4.4 Add the reaction solution to the sorbent train and apply a vacuum so that the solution is drawn through the cartridges at a rate of 3 to 5 ml/min. Release the vacuum after the solution has passed through the sorbent.

3.6.7.3.4.5 Elute each cartridge train with approximately 9 ml of absolute ethanol, directly into a 10 ml volumetric flask. Dilute the solution to volume with absolute ethanol, mixed thoroughly, and place in a tightly sealed vial until analyzed.

3.6.7.3.5 Methylene Chloride Option.

3.6.7.3.5.1 Add 5 ml of acetate buffer and adjust the pH to 5.0±0.5 with glacial acetic acid or 5 N NaOH. Add 10 ml of DNPH reagent, seal the container, and place on a wrist-action shaker for 1 hour.

3.6.7.3.5.2 Extract the solution with three 20 ml portions of methylene chloride, using a 250 ml separatory funnel, and combine the methylene chloride layers. If an emulsion forms upon extraction, remove the entire emulsion and centrifuge at 2000 rpm for 10 minutes. Separate the layers and proceed with the next extraction.

3.6.7.3.5.3 Assemble a Kuderna-Danish (K-D) concentrator by attaching a 10 ml concentrator tube to a 500 ml evaporator flask. Wash the K-D apparatus with 25 ml of extraction solvent to complete the quantitative transfer.

3.6.7.3.5.4 Add one to two clean boiling chips to the evaporative flask and attach a three ball Snyder column. Preheat the Snyder column by adding about 1 ml methylene chloride to the top. Place the K-D apparatus on a hot water bath (80-90 °C) so that the concentrator tube is partially immersed in the hot water and the entire lower rounded surface of the flask is bathed with hot vapor. Adjust the vertical position of the apparatus and the water temperature, as required, to complete the concentration in 10-15 min. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood with condensed solvent. When the apparent volume of liquid reaches

10 ml, remove the K-D apparatus and allow it to drain and cool for a least 10 min.

3.6.7.3.5.5 Prior to liquid chromatographic analysis, the solvent must be exchanged to methanol. The analyst must ensure quantitative transfer of the extract concentrate. The exchange is performed as follows:

3.6.7.3.5.5.1 Following K-D concentration of the methylene chloride extract to <10 ml using the macro Snyder column, allow the apparatus to cool and drain for at least 10 minutes.

3.6.7.3.5.5.2 Momentarily remove the Snyder column, add 5 ml of the methanol, a new glass bed, or boiling chip, and attach the micro Snyder column. Concentrate the extract using 1 ml of methanol to prewet the Snyder column. Place the K-D apparatus on the water bath so that the concentrator tube is partially immersed in the hot water. Adjust the vertical position of the apparatus and the water temperature, as required, to complete concentration. At the proper rate of distillation the balls of the column will actively chatter, but the chambers will not flood. When the apparent volume of liquid reaches <5 ml, remove the K-D apparatus and allow it to drain and cool for at least 10 minutes.

3.6.7.3.5.5.3 Remove the Snyder column and rinse the flask and its lower joint with 1-2 ml of methanol and add to concentrator tube. A 5-ml syringe is recommended for this operation. Adjust the extract volume to 10 ml. Stopper the concentrator tube and store refrigerated at 4 °C if further processing will not be performed immediately. If the extract will be stored longer than two days, it should be transferred to a vial with a Teflon-lined screw cap or crimp top. Proceed with liquid chromatographic analysis if further cleanup is not required.

3.6.7.4 Extraction of Stack Gas Samples Collected by Method 0011.

3.6.7.4.1 Measure the aqueous volume of the sample prior to extraction (for moisture determination in case the volume was not measured in the field). Pour the sample into a separatory funnel and drain the methylene chloride into a volumetric flask.

3.6.7.4.2 Extract the aqueous solution with two or three aliquots of methylene chloride. Add the methylene chloride extracts to the volumetric flask.

3.6.7.4.3 Fill the volumetric flask to the line with methylene chloride. Mix well and remove an aliquot.

3.6.7.4.4 If high levels of formaldehyde are present, the extract can be diluted with mobile phase, otherwise the extract must be solvent exchanged as described in section 3.6.7.5.3.3. If low levels of formaldehyde are present, the sample should be concentrated during the solvent exchange procedure.

3.6.7.5 Chromatographic Conditions.

Column C18, 250 mm×4.6 mm ID, 5 µm particle size
Mobile Phase methanol/water, 75:25 (v/v), isocratic
Flow Rate 1.0 ml/min
UV Detector 360 nm
Injection Volume 20 µl

3.6.7.6 Calibration.

3.6.7.6.1 Establish liquid chromatographic operating parameters to produce a retention time equivalent to that indicated in Table 3.6-1 for the solid sorbent options, or in Table 3.6-2 for methylene chloride option. Suggested chromatographic conditions are provided in section 3.6.7.5. Prepare derivatized calibration standards according to the procedure in section 3.6.7.6.1.1. Calibrate the chromatographic system using the external standard technique (section 3.6.7.6.1.2).

3.6.7.6.1.1 Preparation of calibration standards.
3.6.7.6.1.1.1 Prepare calibration standard solutions of formaldehyde and acetaldehyde in water from the stock standard (section 3.6.5.14.2). Prepare these solutions at the following concentrations (in µg/ml) by serial dilution of the stock standard solution: 50, 20, 10. Prepare additional calibration standard solutions at the following concentrations, by dilution of the appropriate 50, 20, or 10 µg/ml standard: 5, 0.5, 2, 0.2, 1, 0.1.

3.6.7.6.1.1.2 Process each calibration standard solution through the derivatization option used for sample processing (section 3.6.7.3.4 or 3.6.7.3.5).

3.6.7.6.1.2 External standard calibration procedure.

3.6.7.6.1.2.1 Analyze each derivatized calibration standard using the chromatographic conditions listed in Tables 3.6-1 and 3.6-2, and tabulate peak area against concentration injected. The results may be used to prepare calibration curves for formaldehyde and acetaldehyde.

3.6.7.6.1.2.2 The working calibration curve must be verified on each working day by the measurement of one or more calibration standards. If the response for any analyte varies from the previously established responses by more than 10%, the test must be repeated using a fresh calibration standard after it is verified that the analytical system is in control. Alternatively, a new calibration curve may be prepared for that compound. If an autosampler is available, it is convenient to prepare a calibration curve daily by analyzing standards along with test samples.

3.6.7.7 Analysis.

3.6.7.7.1 Analyze samples by HPLC, using conditions established in section 3.6.7.6.1. Tables 3.6-1 and 3.6-2 list the retention times and MDLs that were obtained under these conditions. Other HPLC columns, chromatographic conditions, or detectors

may be used if the requirements for section 3.6.7.1 are met, or if the data are within the limits described in Tables 3.6-1 and 3.6-2.

3.6.7.7.2 The width of the retention time window used to make identifications should be based upon measurements of actual retention time variations of standards over the course of a day. Three times the standard deviation of a retention time for a compound can be used to calculate a suggested window size; however, the experience of the analyst should weigh heavily in the interpretation of the chromatograms.

3.6.7.7.3 If the peak area exceeds the linear range of the calibration curve, a smaller sample volume should be used. Alternatively, the final solution may be diluted with ethanol and reanalyzed.

3.6.7.7.4 If the peak area measurement is prevented by the presence of observed interferences, further cleanup is required. However, none of the 3600 method series have been evaluated for this procedure.

3.6.7.8 Calculations.

3.6.7.8.1 Calculate each response factor as follows (mean value based on 5 points):

$$RF = \frac{\text{concentration of standard}}{\text{area of the signal}}$$

$$5 \left(\sum RF_i \right)$$

$$\text{mean} = RF - RF = \frac{5}{1}$$

3.6.7.8.2 Calculate the concentration of formaldehyde and acetaldehyde as follows: $\mu\text{g}/\text{ml} = (RF)(\text{area of signal})(\text{concentration factor})$

where:

$$\text{concentration factor} = \frac{\text{Final Volume of Extract}}{\text{Initial Extract Volume}}$$

NOTE: For solid samples, a dilution factor must be included in the equation to account for the weight of the sample used.

3.6.7.8.3 Calculate the total weight of formaldehyde in the stack gas sample as follows: $\text{total } \mu\text{g}/\text{ml} = (RF)(\text{area of signal})(\text{concentration factor})$

where:

$$\text{concentration factor} = \frac{\text{Final Volume of Extract}}{\text{Initial Extract Volume}}$$

3.6.8 Quality Control

3.6.8.1 Refer to Chapter One of SW-846 for guidance on quality control procedures.

3.6.9 Method Performance

3.6.9.1 The MDL concentrations listed in Table 3.6-1 were obtained using organic-free water and solid sorbent extraction. Similar results were achieved using a final effluent and eluate leachate. The MDL concentrations listed in Table 3.6-2 were obtained using organic-free water and methylene chloride extraction. Similar results were achieved using representative matrices.

3.6.9.2 This method has been tested for linearity of recovery from spiked organic-free water and has been demonstrated to be applicable over the range from 2xMDL to 200xMDL.

3.6.9.3 In a single laboratory evaluation using several spiked matrices, the average

recoveries presented in Tables 3.6-3 and 3.6-4 were obtained using solid sorbent and methylene chloride extraction, respectively. The standard deviations of the percent recovery are also included in Tables 3.6-3 and 3.6-4.

3.6.9.4 A representative chromatogram is presented in Figure 3.6-1.

3.6.10 References

1. FEDERAL REGISTER, 1986, 51, 40643-40652; November 7.
2. EPA Methods 8010, 7000, 7041, 7060, 7131, 7421, 7470, 7740, and 7841. Test Methods for Evaluating Solid Waste: Physical/Chemical Methods, SW-846, Third Edition. September 1988. Office of Solid Waste and Emergency Response, U.S. Environmental Protection Agency, Washington, DC 20460.

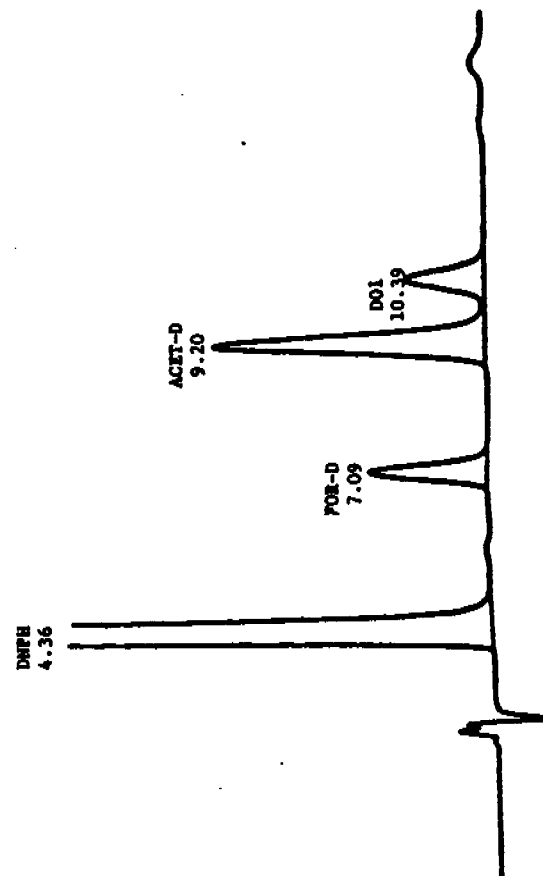
TABLE 3.6-4.—SINGLE OPERATOR ACCURACY AND PRECISION USING METHYLENE CHLORIDE EXTRACTION

Analyte	Matrix type	Average percent recovery (x)	Standard deviation percent (s)	Spike range (µg/L)	No. of analyses
Formaldehyde	Reagent Water	91	2.5	50-1000	9
	Groundwater	92.5	8.2	50	6
	Liquids	88.8	16.3	250	12
Acetaldehyde	Reagent Water	80.3	3.2	50-1000	9
	Groundwater	83.8	10.9	50	12
	Liquids (2 types)	44.0	20.2	250	12
	Solids	58.4	2.7	0.10-1.0	12

* Spike range in units of mg/L.
x = Average recovery expected for this method.
s = Average standard deviation expected for this method.

FIGURE 3.6-1

REPRESENTATIVE CHROMATOGRAM OF A 50 µg/L SOLUTION OF FORMALDEHYDE



FOR-D = Formaldehyde derivative
ACET-D = Acetaldehyde derivative

If any of these criteria are met or the Director determines that this procedure is not appropriate, then detailed site-specific modeling or modeling using the "Screening Procedures for Estimating the Air Quality Impact of Stationary Sources," EPA-450/4-88-010, Office of Air Quality Planning and Standards, August 1988, is required. Detailed site-specific dispersion modeling must conform to the EPA "Guidance on Air Quality Models (Revised)," EPA 450/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July 1988. This document provides guidance on both the proper selection and regulatory application of air quality models.

Introduction

The Hazardous Waste Combustion Air Quality Screening Procedure (HWCASP) (also referred to hereafter as "the screening procedure" or "the procedure") provides a quick, easy method for estimating maximum (hourly) and annual average ambient air impacts associated with the combustion of hazardous waste. The methodology is conservative in nature and estimates dispersion coefficients¹ based on facility-specific information.

The screening procedure can be used to determine emissions limits at sites where the nearest meteorological (STAR) station is not representative of the meteorology at the site. If the screen shows that emissions from the site are adequately protective, then the need to collect site-specific meteorological data can be eliminated.

The screening procedure is generally most helpful for facilities meeting one or more of the following conditions:

- Multiple stacks with substantially different release specifications (e.g., stack heights differ by >50 percent, exit temperatures differ by >50 °K, or the exit flow rates differ by more than a factor of 2).
- Terrain located between 1 km and 5 km from the site increases in elevation by more than the physical height of the shortest stack (i.e., the facility is located in complex terrain), or
- Significant distance between the facility's stacks and the site boundary [guidance on determining whether a distance is "significant" is provided in Step 6(B) of the procedure].

Steps 1 through 9 of the screening procedure present a simplified method for determining emissions based on the use of the "worst-case" stack. If the simplified method shows that desired feed rates result in emissions that exceed allowable limits for one or

¹ The term dispersion coefficient refers to the change in ambient air concentration ($\mu\text{g}/\text{m}^3$) resulting from a source with an emission rate of 1 g/sec.

more pollutants, a refined analysis to examine the emissions from each stack can be conducted. This multiple-stack method is presented in Step 10.

The steps involved in screening methodology are as follows:

- Step 1. Define Source Characteristics
- Step 2. Determine the Applicability of the Screening Procedure
- Step 3. Select the Worst-Case Stack
- Step 4. Verify Good Engineering Practice (GEP) Criteria
- Step 5. Determine the Effective Stack Height and Terrain-Adjusted Effective Stack Height
- Step 6. Classify the Site as Urban or Rural
- Step 7. Determine Maximum Dispersion Coefficients
- Step 8. Estimate Maximum Ambient Air Concentrations
- Step 9. Determine Compliance With Regulatory Limits
- Step 10. Multiple Stack Method

Step 1: Define Source Characteristics

Provide the following source data:²

Stack Data:	Stack No. 1	Stack No. 2	Stack No. 3
Physical stack height (m)			
Exhaust temperature (°K)			
Flow rate (m^3/sec) ..			

Nearby Building Dimensions

Consider all buildings within five building heights or five maximum projected widths of the stack(s). For the building with the greatest height, fill in the spaces below.

Building Height (m) _____
Maximum projected building width (m) _____

Nearby Terrain Data

Determine maximum terrain rise for the following three distance ranges from the facility (not required if the highest stack is less than 10 m in height):

0-0.5 km _____ (m) _____ (m)
0-2.5 km _____ (m) _____ (m)
0-5 km _____ (m) _____ (m)

Distance from facility to nearest shoreline (km) _____
Valley width (km) _____

Step 2: Determine the Applicability of the Screening Procedure

Fill in the following data:

² Worksheet space is provided for three stacks. If the facility has additional stacks, copy the form and revise stack identification numbers for 4, 5, etc.

If the answer to any question is "yes", the procedure is not acceptable.

Is the facility in a valley < km in width? _____
Is the terrain rise within 1 km of the facility greater than the physical stack height of the tallest stack? (Only applies to stacks <20 meters in height) ... _____
Is the distance to the nearest shoreline <3 km? (Only applies to facilities with stacks <20 meters in height) ... _____
For the building listed in Step 1, is the closest property boundary <3 times the building height or <3 times the maximum projected building width? (Only applies to facilities with a stack height <2.5 times the building height) ... _____

If the answer is "no" to all the preceding questions, then the HWCASP is acceptable.

Step 3: Select the Worst-Case Stack

If the facility has several stacks, a worst-case stack must be chosen to conservatively represent release conditions at the facility. Follow the steps below to identify the worst-case stack.

Apply the following equation to each stack:

$$K = HVT$$

where:

K = an arbitrary parameter accounting for the relative influence of the stack height and plume rise.

H = Physical stack height (m)

V = Flow rate (m^3/sec)

T = Exhaust temperature (°K)

Complete the following table to compute the "K" value for each stack:

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Select the stack with the lowest "K" value. This is the worst-case stack that will be used for Steps 4 through 9.

Worst-Case Stack is identified as Stack No. _____

Step 4: Verify Good Engineering Practice (GEP) Criteria

Confirm that the selected worst-case stack meets Good Engineering Practice (GEP) criteria. The stack height to be used in the subsequent steps of this procedure must not be greater than the maximum GEP. Maximum and minimum GEP stack heights are defined as follows:

$$\begin{aligned} \text{GEP (minimum)} &= H + (1.5 \times L) \\ \text{GEP (maximum)} &= \text{greater of } 65 \text{ m or } H + (1.5 \times L) \end{aligned}$$

where:

H = height of the building selected in Step 1 measured from ground level elevation at the base of the stack

L = the lesser dimension of the height or projected width of the building selected in Step 1

Record the following data for the worst-case stack:

Stack height (m) = _____

H(m) = _____

L(m) = _____

Then compute the following:

GEP (minimum) (m) = _____

GEP (maximum) (m) = _____

• If the physical height of the worst-case stack exceeds the maximum GEP, then use the maximum GEP stack height for the subsequent steps of this analysis;

• If the physical height of the worst-case stack is less than the minimum GEP, then use generic source number 11 as the selected source for further analysis and proceed directly to Step 6;

• If the physical height of the worst-case stack is between the minimum and maximum GEP, then use the actual physical stack height for the subsequent steps of this analysis.

Step 5: Determine the Effective Stack Height and the Terrain-Adjusted Effective Stack Height (TAESH)

The effective stack height is an important factor in dispersion modeling. The effective stack height is the physical height of the stack plus plume rise. As specified in Step 4, the stack height used to estimate the effective stack height must not exceed GEP re-

²The terrain is considered flat and terrain adjustment factors are not used if the maximum terrain rise within 5 km of the facility (see Step 1) is less than 10 percent of the physical stack height of the worst-case stack.

quirements. Plume rise is a function of the stack exit gas temperature and flow rate.

In this analysis, the effective stack height is used to select the generic source that represents the dispersion characteristics of the facility. For facilities located in flat terrain and for all facilities with worst-case stacks less than or equal to 10 meters in height, generic source numbers are selected strictly on the basis of effective stack height. In all other cases, the effective stack height is further adjusted to take into account the terrain rise near the facility. This "terrain-adjusted effective stack height" (TAESH) is then used to select the generic source number that represents the dispersion characteristics of the facility. Follow the steps below to identify the effective stack height, the TAESH (where applicable), and the corresponding generic source number.

(A) Go to Table 5.0-1 and find the plume rise value corresponding to the stack temperature and exit flow rate for the worst-case stack determined in Step 3.

Plume rise = _____ (m)

(B) Add the plume rise to the GEP stack height of the worst-case stack determined in Steps 3 and 4.

$$\begin{array}{rcl} \text{GEP stack} & + & \text{Plume rise} \\ \text{height (m)} & & \text{(m)} \\ \hline & & \text{Effective} \\ & & \text{stack height} \\ & & \text{(m)} \end{array}$$

(C) Go to the first column of Table 5.0-2 and identify the range of effective stack heights that includes the effective stack height estimated in Step 5(B). Record the generic source number that corresponds to this range.

Generic source number = _____

(D) If the source is located in flat terrain³, or if the generic source number identified in Step 5(C) above is 1 or 11 (regardless of terrain classification), use the generic source number determined in Step 5(C) and proceed directly to Step 6. Otherwise, continue to Step 5(E).

(E) For those situations where the conditions in Step 5(D) do not apply, the effective stack height must be adjusted for terrain. The TAESH for each distance range is computed by subtracting the terrain rise within the distance range from the effective stack height.⁴

³Refer to Step 1 for terrain adjustment data. Note that the distance from the source to the outer radii of each range is used. For example, for the range >0.5-2.5 km, the maximum terrain rise in the range 0.0-2.5 km is used.

Stack No.	Stack height (m)	Flow rate (m ³ /sec)	Exit temp (°K)
1	_____	_____	_____
2	_____	_____	_____
3	_____	_____	_____
4	_____	_____	_____
5	_____	_____	_____
6	_____	_____	_____
7	_____	_____	_____
8	_____	_____	_____
9	_____	_____	_____
10	_____	_____	_____
11	_____	_____	_____

TABLE 5.0-1.—ESTIMATED PLUME RISE (IN METERS) BASED ON STACK EXIT FLOW RATE AND GAS TEMPERATURE

Flow rate (m³/s)	Exhaust Temperature (°F)									
	<26	325-349	350-399	400-449	450-499	500-549	550-599	600-649	650-699	>1499
<0.5	0	0	0	0	0	0	0	0	0	0
0.5-0.9	0	0	0	0	0	0	0	0	0	0
1.0-1.9	0	0	0	0	0	0	0	0	0	0
2.0-2.9	0	0	0	0	0	0	0	0	0	0
3.0-3.9	0	0	0	0	0	0	0	0	0	0
4.0-4.9	0	0	0	0	0	0	0	0	0	0
5.0-7.4	0	0	0	0	0	0	0	0	0	0
7.5-9.9	0	0	0	0	0	0	0	0	0	0
10.0-12.4	0	0	0	0	0	0	0	0	0	0
12.5-14.9	0	0	0	0	0	0	0	0	0	0
15.0-19.9	0	0	0	0	0	0	0	0	0	0
20.0-24.9	0	0	0	0	0	0	0	0	0	0
25.0-29.9	0	0	0	0	0	0	0	0	0	0
30.0-34.9	0	0	0	0	0	0	0	0	0	0
35.0-39.9	0	0	0	0	0	0	0	0	0	0
40.0-49.9	0	0	0	0	0	0	0	0	0	0
50.0-59.9	0	0	0	0	0	0	0	0	0	0
60.0-69.9	0	0	0	0	0	0	0	0	0	0
70.0-79.9	0	0	0	0	0	0	0	0	0	0
80.0-89.9	0	0	0	0	0	0	0	0	0	0
90.0-99.9	0	0	0	0	0	0	0	0	0	0
100.0-119.9	0	0	0	0	0	0	0	0	0	0
120.0-139.9	0	0	0	0	0	0	0	0	0	0
140.0-159.9	0	0	0	0	0	0	0	0	0	0
160.0-179.9	0	0	0	0	0	0	0	0	0	0
180.0-199.9	0	0	0	0	0	0	0	0	0	0
>199.9	0	0	0	0	0	0	0	0	0	0

TABLE 5.0-2.—Selection of Generic Source Number

Effective stack height (m)	Generic source No.
<10.0	1
10.0-14.9	2
15.0-19.9	3
20.0-24.9	4
25.0-30.9	5
31.0-41.9	6
42.0-52.9	7
53.0-64.9	8
65.0-75.9	9
76.0-86.9	10
87.0-97.9	11
Downwash	

TABLE 5.0-3.—Classification of Land Use Types

Type ¹	Description	Urban or rural designation ²
11	Heavy Industrial	Urban
12	Light/Moderate Industrial	Urban

TABLE 5.0-3.—Classification of Land Use Types—Continued

Type ¹	Description	Urban or rural designation ²
C1	Commercial	Urban
R1	Common Residential (Normal Essences)	Rural
R2	Compact Residential (Single Family)	Urban
R3	Compact Residential (Multi-Family)	Rural
R4	Estate Residential (Multi-Acre Plots)	Rural
A1	Metropolitan Natural	Rural
A2	Agricultural	Rural
A3	Undeveloped (Grassland/Fields)	Rural
A4	Undeveloped (Heavily Wooded)	Rural
A5	Water Surfaces	Rural

¹ EPA, Guidelines on Air Quality Models (Revised), EPA-450/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July, 1986.
² Auer, August H. J., "Correlation of Land Use and Cover with Meteorological Anomalies," *Journal of Applied Meteorology*, pp. 633-643, 1978.

Distance range (km)	Effective stack height (m) [see step 6(B)]	Maximum terrain-rise (m) (see step 1)	TAESH (m)
0.0-0.5	—	—	—
>0.5-2.5	—	—	—
>2.5-6.0	—	—	—

If the terrain rise for any of the distance ranges is greater than the effective stack height, set the TAESH equal to zero and use generic source number 1 for that distance range.
 Record the generic source numbers from Table 5.0-2 based on each of the TAESH values.

Distance range (km)	Generic source No. (after terrain adjustment)
0.0-0.5	—
>0.5-2.5	—
>2.5-6.0	—

Step 6: Classify the Site as Urban or Rural
 (A) Classify the land use near the facility as either urban or rural by determining the percentage of urban land use types (as defined in Table 3; for further guidance see the footnoted references) that fall within 3 km of the facility.^a

Method	Visual	Planimeter
Used to	—	—
Estimate	—	—
Percent	—	—
Urban	—	—
Land Use:	—	—
Estimated	Urban	Rural
Percentages:	—	—

If the urban land use percentage is less than or equal to 30 percent based on a visual estimate, or 50 percent based on a planim-

^a The delineation of urban and rural areas can be difficult for the residential-type areas listed in Table 5.0-3. The degree of resolution in Table 5.0-3 for residential areas often cannot be identified without conducting site area inspections. This process can require extensive analysis, which, for many applications, can be greatly streamlined without sacrificing confidence in selecting the appropriate urban or rural classification. The fundamental simplifying assumption is based on the premise that many applications will have clear-cut urban/rural designations, i.e., most will be in rural settings that can be definitively characterized through a review of aerial photographs, zoning maps, or U.S. Geological Survey topographical maps.

eter, the local land use is considered rural. Otherwise, the local land use is considered urban.
 Classification: Urban Rural
 (check applicable space).

(B) Based on the TAESH and the urban/rural classification of surrounding land use, use the following table to determine the threshold distance between any stack and the nearest facility boundary.

Terrain adjusted effective stack height range (m)	Urban	Rural
1-9.9	200	200
10-14.9	200	250
15-19.9	200	250
20-24.9	200	350
25-30.9	200	450
31-41.9	200	550
42-52.9	200	650
53-64.9	200	800
65-112.9	200	1000
113+	200	1200
	200	1500

Record the following information:

Threshold distance from the table (m):

Minimum distance from any stack to property boundary (m):
 If the minimum distance between any stack and the nearest facility boundary is greater than the threshold distance, the surrounding buffer distance is considered significant and the facility is likely to benefit from use of the HWCASP relative to the Tier I and II limits (see discussion of benefits from using HWCASP in Introduction section).

Step 7: Determine Maximum Dispersion Coefficients

(A) Determine maximum average hourly dispersion coefficients. Based on the results of Step 6(A), select either Table 5.0-4 (urban) or Table 5.0-5 (rural) to determine the maximum average hourly dispersion coefficient.^a For flat terrain (defined in Step 5(D)) and for all sites with generic source numbers 1 or 11.

^a For the distance range 6 to 20 kilometers, generic source number 1 is used to conservatively represent the maximum dispersion coefficient.

use Step 7(A)(1). For rolling or complex terrain (excluding generic source numbers 1 and 11), use Step 7(A)(2).

(1) Search down the appropriate generic source number column (based on Step 6(C)), beginning at the minimum fence-line distance listed in Step 6(B).¹ Record the maximum average hourly dispersion coefficient encountered.

Maximum Average Hourly Dispersion Coefficient = $\frac{\text{Maximum dispersion coefficient} \times \text{Distance}}{\text{Hourly average hourly dispersion coefficient}}$ ($\mu\text{g}/\text{m}^3/\text{hr}$)

(2) For each of the three distance-based generic source numbers listed in Step 5(E),

¹ Exclude all distances that are closer to the facility than the property boundary. For example, if the actual distance to the nearest property boundary is 265 meters, begin at the 300 meter distance in Tables 5.0-4 and 5.0-5.

search down the appropriate generic source number column, beginning at the minimum fence-line distance listed in Step 6(B). Note that different columns may be used for each of the three distance ranges if there is a need for terrain adjustment. Record the maximum dispersion coefficient for each generic source number.

Distance range (m)	Generic source No. from Step 5(E)	Maximum dispersion coefficient ($\mu\text{g}/\text{m}^3/\text{hr}$)
0.0-0.5		
0.5-2.5		
2.5-5.0		
5.0-20.0		

TABLE 5.0-4.—ISCST PREDICTED MAXIMUM CONCENTRATIONS ($\mu\text{g}/\text{m}^3$)¹ FOR HAZARDOUS WASTE COMBUSTORS USING URBAN CONDITIONS

Distance (m)	Generic Source #1 (<10M)	Generic Source #2 (10M)	Generic Source #3 (15M)	Generic Source #4 (20M)	Generic Source #5 (25M)	Generic Source #6 (31M)	Generic Source #7 (42M)	Generic Source #8 (53M)	Generic Source #9 (65M)	Generic Source #10 (113M)	Generic Source #11 (downwind)
0.20	660.1	621.9	416.2	300.7	226.6	163.0	168.5	168.5	168.5	168.5	168.5
0.25	500.0	469.3	351.7	258.2	199.0	147.0	147.0	147.0	147.0	147.0	147.0
0.30	389.3	366.2	304.2	227.7	172.7	130.2	107.9	107.9	107.9	107.9	107.9
0.40	266.5	266.5	218.5	166.5	126.5	97.1	80.0	80.0	80.0	80.0	80.0
0.45	240.8	240.7	195.4	156.7	124.1	103.9	84.4	84.4	84.4	84.4	84.4
0.50	218.5	218.5	175.4	139.2	106.1	87.6	73.1	73.1	73.1	73.1	73.1
0.55	200.3	185.1	145.9	113.8	88.0	74.4	62.9	62.9	62.9	62.9	62.9
0.60	185.1	161.2	126.5	97.8	80.0	67.6	58.9	58.9	58.9	58.9	58.9
0.70	172.2	151.6	110.5	86.1	70.1	61.9	55.4	55.4	55.4	55.4	55.4
0.75	161.2	143.2	104.4	81.4	67.0	57.7	52.3	52.3	52.3	52.3	52.3
0.80	151.6	135.8	99.0	77.2	64.2	55.8	50.4	50.4	50.4	50.4	50.4
0.85	143.2	129.2	94.2	73.4	61.9	53.3	47.2	47.2	47.2	47.2	47.2
0.90	135.8	123.3	89.9	70.1	59.9	51.0	45.0	45.0	45.0	45.0	45.0
0.95	129.2	118.0	86.0	67.0	57.7	49.6	43.1	43.1	43.1	43.1	43.1
1.00	118.0	108.8	80.0	61.9	53.3	46.8	40.7	40.7	40.7	40.7	40.7
1.10	108.8	101.1	73.7	57.4	49.6	43.7	38.7	38.7	38.7	38.7	38.7
1.20	101.1	94.8	68.9	53.7	45.4	40.9	36.5	36.5	36.5	36.5	36.5
1.30	94.8	89.0	64.8	50.5	42.8	39.7	35.2	35.2	35.2	35.2	35.2
1.40	89.0	84.1	61.3	47.8	40.9	37.7	33.2	33.2	33.2	33.2	33.2
1.50	84.1	79.8	58.2	45.4	39.7	36.5	32.0	32.0	32.0	32.0	32.0
1.60	79.8	76.0	55.4	43.2	37.7	35.2	30.7	30.7	30.7	30.7	30.7
1.70	76.0	72.7	53.0	41.3	36.5	34.1	29.6	29.6	29.6	29.6	29.6
1.80	72.7	69.8	50.7	39.8	35.2	33.2	28.7	28.7	28.7	28.7	28.7
1.90	69.8	66.9	48.8	38.0	34.1	32.0	27.5	27.5	27.5	27.5	27.5
2.00	66.9	64.1	46.8	36.5	33.2	31.1	26.4	26.4	26.4	26.4	26.4
2.25	61.1	59.0	44.5	34.7	32.0	29.6	25.4	25.4	25.4	25.4	25.4
2.50	56.4	54.4	41.1	32.1	29.6	27.5	23.3	23.3	23.3	23.3	23.3
2.75	52.3	50.5	38.5	29.9	27.5	25.4	21.2	21.2	21.2	21.2	21.2
3.00	48.3	46.8	36.5	28.0	25.4	23.3	19.2	19.2	19.2	19.2	19.2
4.00	40.2	39.0	32.0	22.8	21.2	19.2	15.2	15.2	15.2	15.2	15.2
5.00	34.5	33.8	28.5	19.8	17.4	15.2	12.8	12.8	12.8	12.8	12.8
6.00	30.7	30.7	25.8	17.8	15.2	13.3	11.3	11.3	11.3	11.3	11.3
7.00	27.8	27.8	23.8	16.5	14.5	12.5	10.5	10.5	10.5	10.5	10.5
8.00	25.8	25.8	22.8	15.5	13.5	11.5	9.5	9.5	9.5	9.5	9.5
9.00	23.8	23.8	21.8	14.5	12.5	10.5	8.5	8.5	8.5	8.5	8.5
10.00	22.3	22.3	20.8	13.5	11.5	9.5	7.5	7.5	7.5	7.5	7.5
15.00	18.0	18.0	17.0	11.0	9.0	7.0	5.0	5.0	5.0	5.0	5.0
20.00	15.0	15.0	14.0	9.0	7.0	5.0	3.0	3.0	3.0	3.0	3.0

TABLE 5.0-4.—ISCT PREDICTED MAXIMUM CONCENTRATIONS ($\mu\text{g}/\text{m}^3$) FOR HAZARDOUS WASTE COMBUSTORS USING URBAN CONDITIONS—

Distance (ft.)	Source #1 (<10M)	Source #2 (10M)	Source #3 (15M)	Source #4 (20M)	Source #5 (25M)	Source #6 (31M)	Source #7 (42M)	Source #8 (53M)	Source #9 (65M)	Source #10 (113M)	Source #11 (Downwind)
20.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
10.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
5.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2.50	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
0.50	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

* Based on a 1 Gram/Second Emission Rate

TABLE 5.0-5.—ISCT PREDICTED MAXIMUM CONCENTRATIONS ($\mu\text{g}/\text{m}^3$) FOR HAZARDOUS WASTE COMBUSTORS USING RURAL CONDITIONS

Distance (ft.)	Source #1 (<10M)	Source #2 (10M)	Source #3 (15M)	Source #4 (20M)	Source #5 (25M)	Source #6 (31M)	Source #7 (42M)	Source #8 (53M)	Source #9 (65M)	Source #10 (113M)	Source #11 (Downwind)
20.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
10.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
5.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2.50	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
1.00	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
0.50	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

* Based on a 1 Gram/Second Emission Rate

(B) Determine annual/hourly ratio for rural analysis. The maximum average annual dispersion coefficient is approximated by multiplying the maximum hourly dispersion coefficient (identified in Step 7(A) by the appropriate ratio selection from Table 6.0-6. The generic source number(s) from Steps 6(C) or 6(E), urban/rural designation (from Step 6), and the terrain type are used to select the appropriate scaling factor. Use the noncomplex terrain designation for all sources located in flat terrain, for all sources where the physical stack height of the worst-

Terrain	Distance from stack (m)	Generic source No.	Maximum hourly dispersion coefficient (≥ 0.1 m/sec)	Annual hourly ratio	Maximum annual dispersion coefficient (≥ 0.1 m/sec)
Flat	0-20.0 20.5-25				
Rolling or Complex	25.5-50.0 50.5-80.0				

¹ Maximum hourly dispersion coefficient times annual/hourly ratio.

Step 8: Estimate Maximum Ambient Air Concentrations—see procedures prescribed in subpart H of 40 CFR part 266.

Step 9: Determine Compliance with Regulatory Limits—see procedures prescribed in subpart H of 40 CFR part 266.

Step 10: Multiple Stack Method (Optional)

This option is a special case procedure that may be helpful when (1) the facility exceeded the regulatory limits for one or more pollutants, as detailed in Step 9, and (2) the facility has multiple stacks with substantially different emission rates and effective release heights. Only those pollutants that fall the

Stack No.	GEP stack height (m)	Flow rate (m ³ /sec)	Exit temp (°K)	Plume rise (m)	Effective stack height (m)
1					
2					
3					

Add an additional page if more than three stacks are involved. Circle the maximum and minimum effective stack heights.

(B) Determine if this multiple-stack screening procedure will likely produce less conservative results than the procedure in Steps 1 through 9. To do this, compute the ratio of maximum-to-minimum effective stack height:

$$\frac{\text{Maximum Effective Stack Height}}{\text{Minimum Effective Stack Height}} =$$

If the above ratio is greater than 1.25, proceed with the remaining steps. Otherwise,

Follow the procedure outlined in Step 4 of the basic screening procedure to determine the GEP for each stack. If a stack's physical height exceeds the maximum GEP, use the maximum GEP values. If a stack's physical

height is less than the minimum GEP, use generic source number 11 in the subsequent steps of this analysis. Follow the procedure in Steps 6(A) and 6(B) to determine the effective height of each stack.

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based on effective stack heights computed in Step 10(A). Refer to Table 5.0-2 provided earlier to identify generic source numbers. Record the generic source numbers identified and proceed to Step 10(F).

Generic Source Numbers ...	Stack No.		
	1	2	3

(D) Compute the TAESH and select generic source numbers (four sources located in nonflat terrain).

1. Compute the TAESH for all remaining stacks using the following equation:

$$HE-TR=TAESH$$

where:

HE=effective stack height (m)

TR=maximum terrain rise for each distance range (m)

TAESH=terrain-adjusted effective stack height (m)

USE THE TABLE BELOW TO CALCULATE THE TAESH FOR EACH STACK⁹

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

Stack No.				
Distance Range (km)				
HE - TR	TAESH	HE - TR	TAESH	HE - TR

⁹ Refer to Step 1 for terrain adjustment data. Note that the distance from the source to the outer radii of each range is used. For example, for the range 0.5-2.5 km, the maximum terrain rise in the range 0.0-2.5 km is used.

For those stacks where the terrain rise within a distance range is greater than the effective stack height (i.e., HE-TR is less than zero), the TAESH for that distance range is set equal to zero, and generic source number 1 should be used for that distance range for all subsequent distance ranges. Additionally, for all stacks with a physical stack height of less than or equal to 10 meters, use generic source number 1 for all distance ranges.¹⁰ For the remaining stacks, proceed to Step 10(D)(2).

2. For the remaining stacks, refer to Table 5.0-2 and, for each distance range, identify the generic source number that includes the TAESH. Use the values obtained from Steps 10(D)(1) and 10(D)(2) to complete the following summary worksheet;

GENERIC SOURCE NUMBER AFTER TERRAIN ADJUSTED (IF NEEDED)

Stack No.	0-0.5 km	0.5-2.5 km	>2.5-5.0 km
1			

¹⁰ This applies to all stacks less than or equal to 10 meters regardless of the terrain classification.

GENERIC SOURCE NUMBER AFTER TERRAIN ADJUSTED (IF NEEDED)—Continued

Stack No.	0-0.5 km	0.5-2.5 km	>2.5-5.0 km
2			
3			

(E) Identify maximum average hourly dispersion coefficients. Based on the land use classification of the site (e.g., urban or rural), use either Table 5.0-4 or Table 5.0-5 to determine the appropriate dispersion coefficient for each distance range for each stack. Begin at the minimum fence line distance indicated in Step 7(B) and record on Worksheet 5.0-1 the dispersion coefficient for each stack/distance range. For stacks located in facilities in flat terrain, the generic source numbers were computed in Step 10(C). For stacks located in facilities in rolling and complex terrain, the generic source numbers were computed in Step 10(D). For flat terrain applications and for stacks with a physical height of less than or equal to 10 meters, only one generic source number is used per stack for all distance ranges. For other applications up to three generic source numbers may be needed per stack (i.e., a unique ge-

nerio source number per distance range). In same for all generic source numbers in order to conservatively represent terrain beyond 5 km (past the limits of the terrain analysis).

Worksheet 5.0-1 Dispersion Coefficient by Downwind Distance¹

Distance	Stack 1	Stack 2	Stack 3
0.25			
0.35			
0.50			
0.75			
1.00			
1.50			
2.00			
2.50			
3.00			
4.00			
5.00			
6.00			
7.00			
8.00			
9.00			
10.00			
12.00			
15.00			
20.00			

¹Notes: This procedure places all stacks at the same point, but allows for consideration of different effective stack heights. The distance to the closest boundary (measured from Step 1) should be the closest distance to any stack.

ER = Annual average emission rate
 DC = Hourly dispersion coefficient (from Worksheet 1)
 C = Estimated maximum hourly ambient air concentration

Distance (mi)	Stack 1 ER = DC = C	Stack 2 ER = DC = C	Stack 3 ER = DC = C	Summed Concentration from all Stacks
1.00				
1.75				
2.00				
2.25				
2.50				
2.75				
3.00				
3.25				
3.50				
3.75				
4.00				
4.25				
4.50				
4.75				
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16.50				
16.75				
17.00				
17.25				
17.50				
17.75				
18.00				
18.25				
18.50				
18.75				
19.00				
19.25				
19.50				
19.75				
20.00				

Worksheet 5.0-2 Maximum Ambient Air Concentration

Pollutant

ER=Annual Average Emission Rate
 DC= Hourly Dispersion Coefficient (from Worksheet 5.0-1)
 C= Estimated Maximum Hourly Ambient Air Concentration

Distance (mi)	Stack 1 ER = DC = C	Stack 2 ER = DC = C	Stack 3 ER = DC = C	Summed Concentration from all Stacks
1.00				
1.75				
2.00				
2.25				
2.50				
2.75				
3.00				
3.25				
3.50				
3.75				
4.00				
4.25				
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18.00				
18.25				
18.50				
18.75				
19.00				
19.25				
19.50				
19.75				
20.00				

Worksheet 5.0-2 Maximum Hourly Ambient Air Concentration

Pollutant

(G) Determine the complex/noncomplex designation for each stack. For each stack, subtract the maximum terrain rise within 5 km of the site from the physical stack height and designate the stack as either complex or noncomplex. If the stack height minus the maximum terrain rise (within 5 km) is greater than zero or if the stack is less than 10 meters in physical height, then assign the stack a noncomplex designation.

Stack No.	Stack height (m)	Maximum terrain rise (m)	Complex	Noncomplex
1				
2				
3				

(H) Identify annual/hourly ratios. Extract the annual/hourly ratios for each stack by referring to Table 5.0-6. Generic source numbers (from Step 10(C) or 10(D), urban/rural designation (from Step 6)), and complex or noncomplex terrain designations (from Step 6) are used to select the appropriate scaling factor needed to convert hourly maximum concentrations to estimates of annual average concentrations.

Stack No.	Generic source No. steps 10 (C or D)		Annual/hourly ratio (from table 5.0-6)	
	Distance ranges (km)		Distance ranges (km)	
	0-0.5	>0.5-2.5	>2.5-6.0	>6.0-10.0
1				
2				
3				

(I) Select the highest annual/hourly ratio among all of the stacks,¹⁴ and then estimate the maximum annual average ambient air concentrations for each pollutant by completing the following table, where:

C=Maximum total hourly ambient air concentration ($\mu\text{g}/\text{m}^3$) for pollutant "N" from Step 10(F),
C_a=Maximum annual average air concentration for pollutant "N" ($\mu\text{g}/\text{m}^3),
R=Annual/hourly ratio.$

TABLE 5.0-6.—95TH PERCENTILE OF ANNUAL/HOURLY RATIOS

Noncomplex Terrain			Complex Terrain		
Source	Urban	Rural	Source	Urban	Rural
1	0.019	0.014	1	0.020	0.053
2	0.003	0.019	2	0.020	0.053
3	0.018	0.018	3	0.030	0.067
4	0.029	0.017	4	0.051	0.047
5	0.028	0.017	5	0.067	0.038
6	0.028	0.017	6	0.059	0.034
7	0.031	0.018	7	0.038	0.031
8	0.030	0.013	8	0.028	0.024
9	0.028	0.011	9	0.028	0.024

¹⁴If any stack (excluding generic stack number 1 and 11) in Step 10(D) shows a negative terrain adjusted stack height, use the complex terrain annual/hourly ratios.

¹⁵As an option, the user can identify the stack with the highest ratio for each distance range (rather than the absolute highest).

TABLE 5.0-6.—95TH PERCENTILE OF ANNUAL/HOURLY RATIOS—Continued

Noncomplex Terrain			Complex Terrain		
Source	Urban	Rural	Source	Urban	Rural
10	0.029	0.008	10	0.017	0.013
11	0.018	0.015	11	0.020	0.053

gulf between urban and rural areas. However, the procedure presented here allows for simplified determinations, where appropriate, to expedite the permitting process.

TABLE 5.0-1.—CLASSIFICATION OF LAND USE TYPES

Type ¹	Description	Urban or rural designation ²
I1	Heavy Industrial	Urban
I2	Light/Moderate Industrial	Urban
C1	Commercial	Urban
R1	Common Residential (Normal Essences)	Rural
R2	Compact Residential (Single Family)	Urban
R3	Compact Residential (Multi-Family)	Urban
R4	Estate Residential (Multi-Acre Plot)	Rural
A1	Metropolitan Natural	Rural
A2	Agricultural	Rural
A3	Undeveloped (Grasses/Weeds)	Rural
A4	Undeveloped (Heavily Wooded)	Rural
A5	Water Surfaces	Rural

¹EPA, Guidelines on Air Quality Models (Revised), EPA-450/2-78-027R, Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina, July 1988.
²Auer, August H. A., "Correlation of Land Use and Cover with Meteorological Parameters," Journal of Applied Meteorology, pp. 636-643, 1978.

6.2 Simplified Land Use Process

The land use approach considers four primary land use types: Industrial (I), commercial (C), residential (R), and agricultural (A). Within these primary classes, subclasses are identified, as shown in table 6.0-1. The goal is to estimate the percentage of the area within a 3-km radius that is urban type and the percentage that is rural type. Industrial and commercial areas are classified as urban; agricultural areas are classified as rural.

The delineation of urban and rural areas, however, can be more difficult for the residential type areas shown in table 6.0-1. The degree of resolution shown in table 6.0-1 for residential areas often cannot be identified without conducting site area inspections and/or referring to zoning maps. This process can require extensive analysis, which, for many applications, can be greatly streamlined without sacrificing confidence in selecting the appropriate urban or rural classification.

The fundamental simplifying assumption is based on the premise that many applications

tions will have clear-cut urban/rural designations, i.e., most will be in rural settings that can be definitively characterized through a brief review of topographical maps. The color coding on USGS topographical maps provides the most effective means of simplifying the typing scheme. The suggested typing designations for the color codes found on topographical maps are as follows:

Green Wooded areas (rural).

White White areas generally will be treated as rural. This code applies to areas that are unwooded and do not have densely

packed structures which would require the pink code (house omission tint). Parks, industrial areas, and unwooded rural land will appear as white on the topographical maps. Of these categories, only the industrial areas could potentially be classified as urban based on EPA 1986 or Auer 1978. Industrial areas can be easily identified in most cases by the characteristics shown in Figure 6.0-1. For this simplified procedure, white areas that have an industrial classification will be treated as urban areas.

Figure 6.0-1
Supplementary Publication Symbols

117	Single track Line weight .005". The weight .003", length .64". Spaced .20" center to center.	
118	Single track abandoned Same as existing track with space .60", dash .16". Label: ABANDONED	
119	Single track under construction Same as existing track with space .60", dash .30". Label: UNDER CONSTRUCTION	
120	Multiple main line track Overall width .617". Line weight .005". The length .64". Spaced .20" center to center. If more than two tracks, label with double cross to left of center. Double cross to .617" overall width.	
121	Multiple track abandoned Same as existing track with space .60", dash .16". Label: ABANDONED	
122	Multiple track under construction Same as existing track with space .60", dash .30". Label: UNDER CONSTRUCTION	
123	Juxtaposition Alternate line, spaced .60" center to center. Minimum space between tracks .617". Line weight for single tracks .005", multiple tracks .003".	
124	Railroad in street The spaced .20" center to center. Label: Railroad Height: The weight .003".	
125	Yards Line weight .005". Space between tracks .611". The spaced .20" center to center, minimum length to touch 8 tracks.	
126	Sidings Line weight .005". Spacing to ends with minimum space between tracks .611". The spaced .20" center to center, length .64" for single track.	
176	Large buildings Outline weight .005". When width exceeds .60", hatch at 45° angle to building in NE direction. Line .005" spaced .60" center to center.	
178	Sewage disposal or filtration plant Line weight .005". See symbol 700 for label. Hatching: Label.	
196	Tanks: oil, gas, water, etc. Circle .60" minimum, 16" maximum. Label as to content.	
197	Tanks: oil, gas, water, etc. Exceeding 16" diameter. Outline weight .003". Hatch 85° NE with .005" line spaced .60" center to center. Label as to content.	

7.5 References

1. Shapiro, S.S. and Wilk, M.B. (1965). "An Analysis of Variance Test for Normality (complete samples)." *Biometrika*, 52, 591-611.
2. Bhattacharyya, G.K. and R.A. Johnson (1977). *Statistical Concepts and Methods*. John Wiley and Sons, New York.

SECTION 8.0—PROCEDURES FOR DETERMINING DEFAULT VALUES FOR AIR POLLUTION CONTROL SYSTEM REMOVAL EFFICIENCIES

During interim status, owners or operators of boilers and industrial furnaces burning hazardous waste must submit documentation to EPA that certifies that emissions of HCl, Cl₂, metals, and particulate matter (PM) are not likely to exceed allowable emission rates. See certification of precompliance under 40 CFR 266.103(b). This documentation also establishes interim status feed rate and operating limits for the facility. For the initial certification, estimates of emissions and system removal efficiencies (SREs) can be made to establish the operating limits. Subsequently, owners or operators must use emissions testing to demonstrate that emissions do not exceed allowable levels, and to establish operating limits. See 40 CFR 266.103(c). However, initial estimates of emissions for certification of precompliance can be based on estimated or established SREs.

The SRE combines the effect of partitioning of the chlorine, metals, or PM and the air pollution control system removal efficiency (APCS RE) for these pollutants. The SRE is defined as:

$SRE = (\text{species input} - \text{species emitted}) / \text{species input}$

The SRE can be calculated from the partitioning factor (PF) and APCS RE by the following formula:

$$SRE = 1 - [(PF/100) \times (1 - APCS RE/100)]$$

where:

PF = percentage of the pollutant partitioned to the combustion gas

Estimates of the PF and/or the APCS RE can be based on either EPA's default values or engineering judgement. EPA's default values for the APCS RE for metals, HCl, Cl₂, and PM are described in this section. EPA's default values for partitioning of these pollutants are described in section 9.0.

Guidelines for the use of engineering judgement to estimate APCS REs or PFs are described in section 9.4.

8.1 APCS RE Default Values for Metals

EPA's default assumptions for APCS RE for metals are shown in Table 8.1-1. The default values in the table are conservative estimates of the removal efficiencies for metals in BIFs, depending on the volatility of the metal and the type of APCS.

If the concentration data are not adequately represented by a normal distribution, the data may be transformed to attain a near normal distribution. The Agency has found that concentration data, especially when near detection levels, often exhibit a lognormal distribution. The assumption of a lognormal distribution has been used in various programs at EPA, such as in the Office of Solid Waste Land Disposal Restrictions program for determination of BDAT treatment standards. The transformed data may be tested for normality using the procedures identified above. If the transformed data are better represented by a normal distribution than the untransformed data, the transformed data should be used in determining the upper tolerance limit using the procedures in Section 7.3 above.

In all cases where the owner or operator wishes to use other than an assumption of normally distributed data or believes that use of an alternate statistical approach is appropriate to the specific data set, he/she must provide supporting rationale in the operating record that demonstrates that the data treatment is based upon sound statistical practice.

7.4 Nondetect Values

The Agency is developing guidance regarding the treatment of nondetect values (data where the concentration of the constituent being measured is below the lowest concentration for which the analytical method is valid) in carrying out the statistical determination described above. Until the guidance information is available, facilities may present their own approach to the handling of nondetect data points, but must provide supporting rationale in the operating record for consideration by the Director.

TABLE 7.0-1.—K VALUES FOR 95% CONFIDENCE AND 95% PROPORTION

Sample size (n)	K
10	2.811
11	2.815
12	2.734
13	2.670
14	2.614
15	2.566
16	2.523
17	2.486
18	2.456
19	2.423
20	2.396
21	2.371
22	2.350
23	2.329
24	2.303
25	2.282

pared to the distribution of a range of values (the minimum of 10 measurements of normal residue concentrations). The upper tolerance limit value is determined as follows:

$$UTL = X + (K \times S)$$

where X = mean of the normal residue concentrations, $X = \sum X/n$.

K = coefficient for sample size n, 95% confidence and 95% proportion.

S = standard deviation of the normal residue concentrations.

$$S = (\sum (X_i - X)^2 / (n - 1))^{1/2}$$

n = sample size.

The values of K at the 95% confidence and 95% proportion, and sample size n are given in Table 7.0-1.

For example, a normal residue test results in 10 samples with the following analytical results for toxic constituent A:

Sample No.	Concentration of constituent A (ppm)
1	10
2	10
3	15
4	10
5	7
6	12
7	10
8	18
9	10
10	15

The mean and the standard deviation of these measurements, calculated using the above equations, are 11.5 and 2.9, respectively. Assuming that the values are normally distributed, the upper tolerance limit (UTL) is given by:

$$UTL = 11.5 + (2.91)(2.9) = 19.9 \text{ ppm}$$

This, if the concentration of constituent A in the waste-derived residue is below 19.9 ppm, then the waste-derived residue is eligible for the Bevill exclusion for constituent A.

7.3 Normal Distribution Assumption

As noted in Section 7.2 above, this statistical approach (use of the upper tolerance limit) for calculation of the concentration in normal residue is based on the assumption that the concentration data are distributed normally. The Agency is aware that concentration data of this type may not always be distributed normally, particularly when concentrations are near the detection limits. There are a number of procedures that can be used to test the distribution of a data set. For example, the Shapiro-Wilk test, examination of a histogram or plot of the data on normal probability paper, and examination of the coefficient of skewness are methods that may be applicable, depending on the nature of the data (References 1 and 2).

Section 7.0—Statistical Methodology for Bevill Residue Determinations

This section describes the statistical comparison of waste-derived residue to normal residue for use in determining eligibility for the Bevill exemption under 40 CFR 266.112.

7.1 Comparison of Waste-Derived Residue to Normal Residue

To be eligible for the Bevill exclusion from the definition of hazardous waste under 40 CFR 266.112(b)(1), waste-derived residue must not contain Appendix VIII, Part 261, constituents that could reasonably be attributable to the hazardous waste (toxic constituents) at concentrations significantly higher than in residue generated without burning or processing hazardous waste (normal residue). Concentrations of toxic constituents in normal residue are determined based on analysis of a minimum of 10 samples representing a minimum of 10 days of operation. The statistically-derived concentrations in normal residue are determined as the upper tolerance limit (95% confidence with a 95% proportion of the sample distribution) of the normal residue concentrations. The upper tolerance limit is to be determined as described in Section 7.2 below. If changes in raw materials or fuels could lower the statistically-derived concentrations of toxic constituents of concern, the statistically-derived baseline must be re-established for any such mode of operation with the new raw material or fuel.

Concentrations of toxic constituents in waste-derived residue are determined based on the analysis of one or more samples collected over a compositing period of not more than 24 hours. Multiple samples of the waste-derived residue may be analyzed or subsamples may be composited for analysis, provided that the sampling period does not exceed 24 hours. If more than one sample is analyzed to characterize the waste-derived residue generated over a 24-hour period, the arithmetic mean of the concentrations must be used as the waste-derived concentration for each constituent.

The concentration of a toxic constituent in the waste-derived residue is not considered to be significantly higher than in the normal residue (i.e., the residue passes the Bevill test for that constituent) if the concentration in the waste-derived residue does not exceed the statistically-derived concentration.

7.2 Calculation of the Upper Tolerance Limit

The 95% confidence with 95% proportion of the sample distribution (upper tolerance limit) is calculated for a set of values assuming that the values are normally distributed. The upper tolerance limit is a one-sided calculation and is an appropriate statistical test for cases in which a single value (the waste-derived residue concentration) is com-

The volatility of a metal depends on the temperature, the thermal input, the chlorine content of the waste, and the identity and concentration of the metal. Metals that do not vaporize at combustion zone temperatures are classified as "nonvolatile". Such metals typically enter the APCS in the form of large particles that are removed relatively easily. Metals that vaporize in the combustion zone and condense before entering the APCS are classified as "volatile". Such metals typically enter the APCS in the form of very fine, submicron particles that are rather inefficiently removed in many APCSs. Metals that vaporize in the combustion zone and do not condense before entering the APCS are classified as "very volatile". Such metals enter the APCS in the form of a vapor that is very inefficiently removed in many APCSs.

Typically, BIFs have combustion zone temperatures high enough to vaporize any hazardous metal at concentrations sufficient to exceed risk-based emission limits. For this reason, the default assumption is that there are no nonvolatile metals. Tables 8.1-2 and 8.1-3 are used to determine whether metals are classified as "volatile" or "very volatile" depending on the temperature entering the APCS, the thermal input, and whether the waste is chlorinated or nonchlorinated.

TABLE 8.1-2.—TEMPERATURE (F) ENTERING APCS ABOVE WHICH METALS ARE CLASSIFIED AS VERY VOLATILE IN COMBUSTION OF NONCHLORINATED WASTES

Metal	Thermal Input (MBtu/hr) ¹					
	Symbol	1	10	100	1000	10000
Arsenic	As	320	280	240	200	160
Cadmium	Cd	1040	940	860	780	720
Chromium	Cr	2000	1760	1580	1420	1360
Beryllium	Be	1680	1440	1240	1060	980
Antimony	Sb	880	600	540	480	420
Barium	Ba	2240	1820	1540	1360	1240
Lead	Pb	1260	1180	1060	1000	920
Mercury	Hg	340	300	260	220	180
Silver	Ag	1620	1640	1480	1340	1220
Thallium	Tl	900	800	700	620	540

¹ Interpolation of thermal input is not allowed. If a BIF line between two ranges, the APCS temperature under the higher thermal input must be used.
Example: For a BIF firing 10-100 MBtu/hr, Mercury is considered very volatile at APCS temperatures above 260 F and volatile at APCS temperatures of 200 F and below.

TABLE 8.1-3.—TEMPERATURE (F) ENTERING APCS ABOVE WHICH METALS ARE CLASSIFIED AS VERY VOLATILE IN COMBUSTION OF CHLORINATED WASTES

Metal	Thermal Input (MBtu/hr) ¹					
	Symbol	1	10	100	1000	10000
Arsenic	As	320	280	240	200	160
Cadmium	Cd	1040	940	860	780	720
Chromium	Cr	>140	>140	>140	>140	>140
Beryllium	Be	1680	1440	1240	1080	980
Antimony	Sb	880	600	540	480	420
Barium	Ba	2080	1840	1680	1540	1420
Lead	Pb	>140	>140	>140	>140	>140
Mercury	Hg	340	300	260	220	180
Silver	Ag	1680	1640	1480	1340	1220

TABLE 8.1-1.—AIR POLLUTION CONTROL SYSTEMS (APCS) AND THEIR CONSERVATIVELY ESTIMATED EFFICIENCIES FOR CONTROLLING TOXIC METALS (%)

APCS	Metal Volatility		
	Nonvolatile	Volatile	Very Volatile
WS	40	30	20
VS-20	60	75	20
VS-60	67	75	40
ESP-1	90	75	0
ESP-2	92	80	0
ESP-4	95	85	0
WESP	90	85	40
FF	90	90	0
DSFF	97	90	0
DSFF	95	90	0
IWS	90	87	75

WS=Wet Scrubber Including: Sieve Tray Tower, Packed Tower, Bubble Cap Tower
VS-20=Venturi Scrubber, ca. 20-30 in W.G. Δp
VS-60=Venturi Scrubber, ca. >60 in W.G. Δp
ESP-1=Electrostatic Precipitator; 1 stage
ESP-2=Electrostatic Precipitator; 2 stage
ESP-4=Electrostatic Precipitator; 4 stage
IWS=Ionizing Wet Scrubber
DS=Dry Scrubber
FF=Fabric Filter (Baghouse)
SD=Spray Dryer (Wet/Dry Scrubber)
WESP=Wet Electrostatic Precipitator

TABLE 8.1-3.—TEMPERATURE (F) ENTERING APCS ABOVE WHICH METALS ARE CLASSIFIED AS VERY VOLATILE IN COMBUSTION OF CHLORINATED WASTES—Continued

Metal	Thermal Input (MBtu/hr) ¹					
	Symbol	1	10	100	1000	10000
Thallium	Tl	900	800	700	620	540

¹ Interpolation of thermal input is not allowed. If a BIF line between two ranges, the APCS temperature under the higher thermal input must be used.
Example: For a BIF firing 10-100 MBtu/hr, Mercury is considered very volatile at APCS temperatures above 260 F and volatile at APCS temperatures of 200 F and below.

A waste is considered chlorinated if chlorine is present in concentrations greater than 0.1 percent by weight. In the EPA guidance document "Guidance for Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators, Volume IV of the Hazardous Waste Incineration Guidance Series," (1) one percent is used for the chlorinated/nonchlorinated cutoff. However, best engineering judgement, based on examination of pilot-scale data reported by Carroll et al. (2) on the effects of waste chlorine content on metals emissions, suggests that the 1 percent cutoff may not be sufficiently conservative.

Tables 8.1-2 and 8.1-3 were compiled based on equilibrium calculations. Metals are classified as very volatile at all temperatures above the temperature at which the vapor pressure of the metal is greater than 10 percent of the vapor pressure that results in emissions exceeding the most conservative risk-based emissions limits.

8.2 APCS RE Default Values for HCl and Cl₂

Default assumptions for APCS RE for HCl and Cl₂ are shown in Table 8.2-1. This table is identical to the column for other BIFs except that cement kilns have a minimum HCl removal efficiency of 83 percent. Because of the alkaline nature of the raw materials in cement kilns, most of the chlorine is converted to chloride salts. Thus, the minimum APCS RE for HCl for cement kilns is independent of the APCS train.

Removal efficiency of Cl₂ for most types of APCS is generally minimal. Therefore, the default assumption for APCS RE for Cl₂ for all APCSs is 0 percent. This is applicable to all BIFs, including cement kilns.

8.3 APCS RE Default Values for Ash

Default assumptions for APCS RE for PM are also shown in Table 8.1-4. These figures are conservative estimates of PM removal efficiencies for different types of APCSs. They are identical to the figures in the Nonvolatile APCS RE column for hazardous metals presented in Table 8.1-1 because the same collection mechanisms and collection efficiencies that apply to nonvolatile metals also apply to PM.

TABLE 8.2-1.—AIR POLLUTION CONTROL SYSTEMS (APCS) AND THEIR CONSERVATIVELY ESTIMATED EFFICIENCIES FOR REMOVING HYDROGEN CHLORIDE (HCL) AND PARTICULATE MATTER (PM) (%)

APCS	HCl		
	Cement kilns	Other BIFs	PM
WS	97	97	40
VS-20	97	97	87
VS-60	98	98	87
ESP-1	83	0	90
ESP-2	83	0	92
ESP-4	83	0	95
WESP	83	70	90
FF	83	0	90
DSFF	98	98	97
DSFF	98	98	95
WS/WS	99	99	95
IWS	99	99	90

WS=Wet Scrubber Including: Sieve Tray Tower, Packed Tower, Bubble Cap Tower
PS=Proprietary Wet Scrubber Design (A number of proprietary wet scrubbers have come on the market in recent years that are highly efficient on both particulates and corrosive gases. Two such units are offered by Calvert Environmental Equipment Co. and by Hydro-Sonic Systems, Inc.).

VS-20=Venturi Scrubber, ca. 20-30 in W.G. Δp
VS-60=Venturi Scrubber, ca. >60 in W.G. Δp
ESP-1=Electrostatic Precipitator; 1 stage
ESP-2=Electrostatic Precipitator; 2 stage
ESP-4=Electrostatic Precipitator; 4 stage
IWS=Ionizing Wet Scrubber
DS=Dry Scrubber
FF=Fabric Filter (Baghouse)
SD=Spray Dryer (Wet/Dry Scrubber)

8.4 References

1. U.S. Environmental Protection Agency. "Guidance on Metals and Hydrogen Chloride Controls for Hazardous Waste Incinerators." Office of Solid Waste, Washington, DC, August 1989.
2. Carroll, G.J., R.C. Thurnau, R.E. Maurin, L.R. Waterland, J.W. Lee, and D.J. Fournier. The Partitioning of Metals in Rotary Kiln Incineration. Proceedings of the Third International Conference on New Frontiers for Hazardous Waste Management. NTIS Document No. EPA/600/9-89/072, p. 555 (1989).

SECTION 9.0—PROCEDURES FOR DETERMINING DEFAULT VALUES FOR PARTICULATES, METALS, ASH, AND TOTAL CHLORIDE/CHLORINE

Pollutant partitioning factor estimates can come from two sources: default assumptions or engineering judgement. EPA's default assumptions are discussed below for metals, HCl, Cl₂, and PM. The default assumptions are used to conservatively predict the partitioning factor for several types of BIFs. Engineering judgement-based partitioning factor estimates are discussed in section 9.4.

9.1 Partitioning Default Value for Metals

To be conservative, the Agency is assuming that 100 percent of each metal in each feed stream is partitioned to the combustion gas. Owners/operators may use this default value or a supportable, site-specific value developed following the general guidelines provided in section 9.4.

9.2 Special Procedures for Chlorine, HCl, and Cl₂

The Agency has established the special procedures presented below for chlorine because the emission limits are based on the pollutants HCl and Cl₂ formed from chlorine to the combustor. Therefore, the owner/operator must estimate the controlled emission rate of both HCl and Cl₂ and show that they do not exceed allowable levels.

1. The default partitioning value for the fraction of chlorine in the total feed streams that is partitioned to combustion gas is 100 percent. Owners/operators may use this default value or a supportable, site-specific value developed following the general guidelines provided in section 9.4.

2. To determine the partitioning of chlorine in the combustion gas to HCl versus Cl₂, either use the default values below or use supportable site-specific values developed following the general guidelines provided in section 9.4.

• For BIFs excluding halogen acid furnaces (HAFs), with a total feed stream chlorine/hy-

drogen ratio ≤ 0.95 , the default partitioning factor is 20 percent Cl₂, 80 percent HCl.

• For HAFs and for BIFs with a total feed stream chlorine/hydrogen ratio > 0.95 , the default partitioning factor is 100 percent Cl₂.

3. To determine the uncontrolled (i.e., prior to acid gas APCS) emission rate of HCl and Cl₂, multiply the feed rate of chlorine times the partitioning factor for each pollutant. Then, for HCl, convert the chlorine emission rate to HCl by multiplying it by the ratio of the molecular weight of HCl to the molecular weight of Cl (i.e., 36.5/35.5). No conversion is needed for Cl₂.

9.3 Special Procedures for Ash

This section: (1) Explains why ash feed rate limits are not applicable to cement and light-weight aggregate kilns; (2) presents the default partitioning values for ash; and (3) explains how to convert the 0.06 grds/cf, corrected to 7% O₂, PM emission limit to a PM emission rate.

Waiver for Cement and Light-Weight Aggregate Kilns. For cement kilns and light-weight aggregate kilns, raw material feed streams contain the vast majority of the ash input, and a significant amount of the ash in the feed stream is entrained into the kiln exhaust gas. For these devices, the ash content of the hazardous waste stream is expected to have a negligible effect on total ash emissions. For this reason, there is no ash feed rate compliance limit for cement kilns or light-weight aggregate kilns. Nonetheless, cement kilns and light-weight aggregate kilns are required to initially certify that PM emissions are not likely to exceed the PM limit, and subsequently, certify through compliance testing that the PM limit is not exceeded.

Default Partitioning Value for Ash. The default assumption for partitioning of ash depends on the feed stream firing system. There are two methods by which materials may be fired into BIFs: Suspension-firing and bed-firing.

The suspension category includes atomized and lance pumpable liquids and suspension-fired pulverized solids. The default partitioning assumption for materials fired by these systems is that 100 percent of the ash partitions to the combustion gas.

The bed-fired category consists principally of stoker boilers and raw materials (and in some cases containerized hazardous waste) fed into cement and light-weight aggregate kilns. The default partitioning assumption for materials fired on a bed is that 5 percent of the ash partitions to the combustion gas.

Converting the PM Concentration-Based Standard to a PM Mass Emission Rate. The emission limit for BIFs is 0.06 grds/cf, corrected to 7% O₂, unless a more stringent standard applies (e.g., a New Source Performance Standard (NSPS) or a State standard and implemented under the State Implement-

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tation Plan (SIP). To convert the 0.06 grds/cf standard to a PM mass emission rate:

1. Determine the flue gas O₂ concentration (percent by volume, dry) and flue gas flow rate (dry standard cubic feet per minute), and

2. Calculate the allowable PM mass emission rate by multiplying the concentration-based PM emission standard times the flue gas flow rate times a dilution correction factor equal to $[(21-O_2)/21]$ concentration from step 1 $[(21-7)/21]$.

9.4 Use of Engineering Judgement To Estimate Partitioning and APCS RE Values

Engineering judgement may be used in place of EPA's conservative default assumptions to estimate partitioning and APCS RE values provided that the engineering judgement is defensible and properly documented. To properly document engineering judgement, the owner/operator must keep a written record of all assumptions and calculations necessary to justify the APCS RE used. The owner/operator must provide this record to the Director upon request and must be prepared to defend the assumptions and calculations used.

If the engineering judgement is based on emissions testing, the testing will often document the emission rate of a pollutant relative to the feed rate of that pollutant rather than the partitioning factor or APCS RE. Examples of situations where the use of engineering judgement may be supportable to estimate a partitioning factor, APCS RE, or SRE include:

- Using emissions testing data from the facility to support an SRE, even though the testing may not meet full QA/QC procedures (e.g., triplicate test runs). The closer the test results conform with full QA/QC procedures and the closer the operating conditions during the test conform with the established operating conditions for the facility, the more supportable the engineering judgement will be.
- Applying emissions testing data documenting an SRE for one metal, including nonhazardous surrogate metals to another less volatile metal.
- Applying emissions testing data documenting an SRE from one facility to a similar facility.
- Using APCS vendor guarantees of removal efficiency.

9.5 Restrictions on Use of Test Data

The measurement of an SRE or an APCS RE may be limited by the detection limits of the measurement technique. If the emission of a pollutant is undetectable, then the calculation of SRE or APCS RE should be based on the lower limit of detectability. An SRE or APCS RE of 100 percent is not acceptable.

Further, mass balance data of facility inputs, emissions, and products/residues may not be used to support a partitioning factor, given the inherent uncertainties of such procedures. Partitioning factors other than the default values may be supported based on engineering judgement, considering, for example, process chemistry. Emissions test data may be used to support an engineering judgement-based SRE, which includes both partitioning and APCS RE.

9.5 References

1. Barton, R.G., W.D. Clark, and W.R. Secker. (1980) "Fate of Metals in Waste Combustion Systems." Combustion Science and Technology, 74, 1-6, p. 37

SECTION 10.0—ALTERNATIVE METHODOLOGY FOR IMPLEMENTING METALS CONTROLS

10.1 Applicability

This method for controlling metals emissions applies to cement kilns and other industrial furnaces operating under interim status that recycle emission control residue back into the furnace.

10.2 Introduction

Under this method, cement kilns and other industrial furnaces that recycle emission control residue back into the furnace must comply with a kiln dust concentration limit (i.e., a collected particulate matter (PM) limit) for each metal, as well as limits on the maximum feedrates of each of the metals in: (1) pumpable hazardous waste; and (2) all hazardous waste.

The following subsections describe how this method for controlling metals emissions is to be implemented:

- Subsection 10.3 discusses the basis of the method and the assumptions upon which it is founded;
- Subsection 10.4 provides an overview of the implementation of the method;
- Subsection 10.5 is a step-by-step procedure for implementation of the method;
- Subsection 10.6 describes the compliance procedures for this method; and
- Appendix A describes the statistical calculations and tests to be used in the method.

10.3 Basis

The viability of this method depends on three fundamental assumptions:

- (1) Variations in the ratio of the metal concentration in the emitted particulate to the metal concentration in the collected kiln dust (referred to as the enrichment factor or EF) for any given metal at any given facility will fall within a normal distribution that can be experimentally determined.
- (2) The metal concentrations in the collected kiln dust can be accurately and rep-

representatively measured (using procedures specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (SW-846), incorporated by reference in 40 CFR 260.11).

$$ME \left(\frac{\text{lb Emitted Metal}}{\text{hr}} \right) -$$

$$PME \left(\frac{\text{lb PM}}{\text{hr}} \right) DMC \left(\frac{\text{lb Dust Metal}}{\text{lb Dust}} \right) EF \left(\frac{\text{lb Emitted Metal}}{\text{lb PM}} \right) \quad (1)$$

Where:
ME is the metal emitted;
PME is the particulate matter emitted;
DMC is the metal concentration in the collected kiln dust; and
EF is the enrichment factor, which is the ratio of the metal concentration in the emitted particulate matter to the metal concentration in the collected kiln dust.

$$DMCL \left(\frac{\text{lb Dust Metal}}{\text{lb Dust}} \right) = \frac{\text{Tier III Limit} \left(\frac{\text{lb Emitted Metal}}{\text{hr}} \right)}{PME \left(\frac{\text{lb PM}}{\text{hr}} \right) EF \left(\frac{\text{lb Emitted Metal}}{\text{lb PM}} \right)} \quad (2)$$

The enrichment factor used in the above equation must be determined experimentally from a minimum of 10 tests in which metal concentrations are measured in kiln dust and stack samples taken simultaneously. This approach provides a range of enrichment factors that can be inserted into a statistical distribution (t-distribution) to determine $EF_{95\%}$ and $EF_{99\%}$. $EF_{95\%}$ is the value at

$$DMCL \left(\frac{\text{lb Dust Metal}}{\text{lb Dust}} \right) = \frac{\text{Tier III Limit} \left(\frac{\text{lb Emitted Metal}}{\text{hr}} \right)}{PME \left(\frac{\text{lb PM}}{\text{hr}} \right) EF_{95\%} \left(\frac{\text{lb Emitted Metal}}{\text{lb PM}} \right)} \quad (3)$$

If the kiln dust metal concentration is just above this "violation" limit, and the PM emissions are at the PM emissions limit, there is a 5% chance that the metal emissions are above the Tier III limit. In such a case, the facility would be in violation of the metals standard.

To provide a margin of safety, a second, more conservative kiln dust metal concentration limit is also used. This "conservative" dust metal concentration limit (DMCL_c) is calculated using a "safe" enrichment factor (SEF). If $EF_{95\%}$ is greater than two times the value of $EF_{95\%}$, the "safe" en-

richment factor can be calculated using Equation 4a:

$$SEF = 2 EF_{95\%} \quad (4a) Q02$$

If $EF_{95\%}$ is not greater than two times the value of $EF_{95\%}$, the "safe" enrichment factor can be calculated using Equation 4b:

$$SEF = EF_{95\%} \quad (4b)$$

In cases where the enrichment factor cannot be determined because the kiln dust metal concentration is nondetectable, the "safe" enrichment factor is as follows:

$$SEF = 100 \quad (4c)$$

For all cases, the "conservative" dust metal concentration limit is calculated using the following equation:

$$DMCL_c \left(\frac{\text{lb Dust Metal}}{\text{lb Dust}} \right) = \frac{\text{Tier III Limit} \left(\frac{\text{lb Emitted Metal}}{\text{hr}} \right)}{PME \left(\frac{\text{lb PM}}{\text{hr}} \right) SEF \left(\frac{\text{lb Emitted Metal}}{\text{lb PM}} \right)} \quad (5)$$

If the kiln dust metal concentration at a facility is just above the "conservative" limit based on that "safe" enrichment factor provided in Equation 4a, and the PM emissions are at the PM emissions limit, there is a 5% chance that the metal emissions are above one-half the Tier III limit. If the kiln dust metal concentration at the facility is just above the "conservative" limit based on the "safe" enrichment factor provided in Equation 4b, and the PM emissions are at the PM emissions limit, there is a 1% chance that the metal emissions are above the Tier III limit. In either case, the facility would be unacceptably close to a violation. If this situation occurs more than 5% of the time, the facility would be required to rerun the series of 10 tests to determine the enrichment factor. To avoid this expense, the facility would be advised to reduce its metals feedrates or to take other appropriate measures to maintain its kiln dust metal concentrations in compliance with the "conservative" dust metal concentration limits.

In cases where the enrichment factor cannot be determined because the kiln dust metal concentration is nondetectable, and

thus no $EF_{95\%}$ exists, the "violation" dust metal concentration limit is set at ten times the "conservative" limit:

$$DMCL_c = 10 \times DMCL \quad (6)$$

10.4 Overview

The flowchart for implementing the method is shown in Figure 10.4-1. The general procedure is as follows:

- Follow the certification of precompliance procedures described in subsection 10.6 (to comply with 40 CFR 266.103(b)).
- For each metal of concern, perform a series of tests to establish the relationship (enrichment factor) between the concentration of emitted metal and the metal concentration in the collected kiln dust.
- Use the demonstrated enrichment factor, in combination with the Tier III (or Tier II) metal emission limit and the most stringent applicable particulate emission limit, to calculate the "violation" and "conservative" dust metal concentration limits. Include this information with the certification of compliance under 40 CFR 266.103(c).

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- Perform daily and/or weekly monitoring of the cement kiln dust metal concentration to ensure (with appropriate QA/QC) that the metal concentration does not exceed either limit.
- If the cement kiln dust metal concentration exceeds the "conservative" limit more than 5% of the time (i.e., more than three failures in last 60 tests), the series of tests to determine the enrichment factor must be repeated.
- If the cement kiln dust metal concentration exceeds the "violation" limit, a violation has occurred.
- Perform quarterly tests to verify that the enrichment factor has not increased significantly. If the enrichment factor has increased, the series of tests to determine the enrichment factor must be repeated.

10.5 Implementation Procedures

A step-by-step description for implementing the method is provided below:

- (1) Prepare initial limits and test plans.
- Determine the Tier III metal emission limit. The Tier II metal emission limit may also be used (see 40 CFR 266.108).
- Determine the applicable PM emission standard. This standard is the most stringent particulate emission standard that applies to the facility. A facility may elect to restrict itself to an even more stringent self-imposed PM emission standard, particularly if the facility finds that it is easier to control particulate emissions than to reduce the kiln dust concentration of a certain metal (i.e., lead).

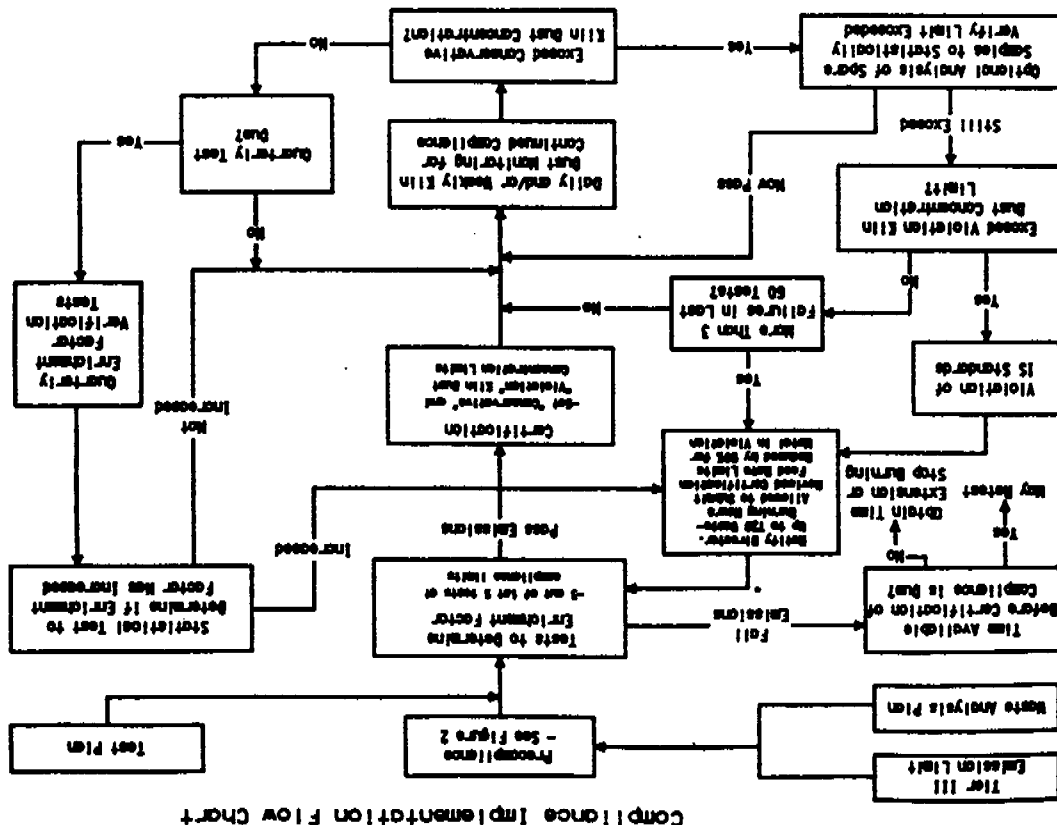
• Determine which metals need to be monitored (i.e., all hazardous metals for which Tier III emission limits are lower than PM emission limits—assuming PM is pure metal).

• Follow the compliance procedures described in Subsection 10.6.

• Follow the guidelines described in SW-846 for preparing test plans and waste analysis plans for the following tests:

- Compliance tests to determine limits on metal feedrates in pumpable hazardous wastes and in all hazardous wastes (as well as to determine other compliance parameters);
- Initial tests to determine enrichment factors;
- Quarterly tests to verify enrichment factors;
- Analysis of hazardous waste feedstreams; and
- Daily and/or weekly monitoring of kiln dust for continuing compliance.

- If the cement kiln dust metal concentration exceeds the "conservative" limit more than 5% of the time (i.e., more than three failures in last 60 tests), the series of tests to determine the enrichment factor must be repeated.
- If the cement kiln dust metal concentration exceeds the "violation" limit, a violation has occurred.
- Perform quarterly tests to verify that the enrichment factor has not increased significantly. If the enrichment factor has increased, the series of tests to determine the enrichment factor must be repeated.
- If the cement kiln dust metal concentration exceeds the "violation" limit, a violation has occurred.
- Perform quarterly tests to verify that the enrichment factor has not increased significantly. If the enrichment factor has increased, the series of tests to determine the enrichment factor must be repeated.



- Chromium must be treated as a special case:
- The enrichment factor for total chromium is calculated in the same way as the enrichment factor for other metals (i.e., the enrichment factor is the ratio of the concentration of total chromium in the emitted particulate matter to the concentration of total chromium in the collected kiln dust).
- The enrichment factor for hexavalent chromium (if measured) is defined as the ratio of the concentration of hexavalent chromium in the emitted particulate matter to the concentration of total chromium in the collected kiln dust.
- (3) Use the enrichment factors measured in Step 2 to determine EF_{hex} , EF_{total} , and SEP.
- Calculate EF_{hex} and EF_{total} according to the t-distribution as described in Appendix A
- Calculate SEP by
 - Equation 4a if EF_{hex} is determinable and if EF_{total} is greater than two times EF_{hex} .
 - Equation 4b if EF_{hex} is determinable and if EF_{total} is not greater than two times EF_{hex} .
 - Equation 4c if EF_{hex} is not determinable.
- The facility may choose to set an even more conservative SEP to give itself a larger margin of safety between the point where corrective action is necessary and the point where a violation occurs.
- (4) Prepare certification of compliance.
- Calculate the "conservative" dust metal concentration limit (DMCL_c) using Equation 5.
- Chromium is treated as a special case. The "conservative" kiln dust chromium concentration limit is set for total chromium, not for hexavalent chromium. The limit for total chromium must be calculated using the Tier III (or Tier II) metal limit for hexavalent chromium.
- If the stack samples described in Step 2 were analyzed for hexavalent chromium, the SEP based on the hexavalent chromium enrichment factors (as defined in Step 2) must be used in this calculation.
- If the stack samples were not analyzed for hexavalent chromium, then the SEP based on the total chromium enrichment factor must be used in this calculation.
- Calculate the "violation" dust metal concentration limit (DMCL_v) using Equation 3 if EF_{hex} is determinable, or using Equation 6 if EF_{hex} is not determinable.
- Chromium is treated as a special case. The "violation" kiln dust chromium concentration limit is set for total chromium, not for hexavalent chromium. The limit for total chromium must be calculated using the Tier III (or Tier II) metal limit for hexavalent chromium.
- If the stack samples taken in Step 2 were analyzed for hexavalent chromium, the EF_{hex} based on the hexavalent chromium

- enrichment factor (as defined in Step 2) should be used in this calculation.
- If the stack samples were not analyzed for hexavalent chromium, the EF_{hex} based on the total chromium enrichment factor must be used in this calculation.
- Submit certification of compliance.
- Steps 2-4 must be repeated for recertification, which is required once every 3 years (see § 266.103(d)).
- (5) Monitor metal concentrations in kiln dust for continuing compliance, and maintain compliance with all compliance limits for the duration of interim status.
- Metals to be monitored during compliance testing are classified as either "critical" or "noncritical" metals.
- All metals must initially be classified as "critical" metals and be monitored on a daily basis.
- A "critical" metal may be reclassified as a "noncritical" metal if its concentration in the kiln dust remains below 10% of its "conservative" kiln dust metal concentration limit for 30 consecutive daily samples.
- "Noncritical" metals must be monitored on a weekly basis.
- A "noncritical" metal must be reclassified as a "critical" metal if its concentration in the kiln dust is above 10% of its "conservative" kiln dust metal concentration limit for any single daily or weekly sample.
- Noncompliance with the sampling and analysis schedule prescribed by this method is a violation of the metals controls under § 266.103.
- Follow the sampling, composting, and analytical procedures described in this method and in SW-846 as they pertain to the condition and accessibility of the kiln dust.
- Follow the same procedures and sample at the same locations as were used for kiln dust samples collected to determine the enrichment factors (as discussed in Step 2).
- Samples must be collected at least once every 8 hours, and a daily composite must be prepared according to SW-846 procedures.
- At least one composite sample is required. This sample is referred to as the "required" sample.
- For QA/QC purposes, a facility may elect to collect two or more additional samples. These samples are referred to as the "spare" samples. These additional samples must be collected over the same time period and according to the same procedures as those used for the "required" sample.
- Samples for "critical" metals must be daily composites.
- Samples for "noncritical" metals must be weekly composites. These samples can be composites of the original 8-hour samples, or they can be composites of daily composite samples.

- Analyze the "required" sample to determine the concentration of each metal.
- This analysis must be completed within 48 hours of the close of the sampling period. Failure to meet this schedule is a violation of the metals standards of § 266.103.
- If the "conservative" kiln dust metal concentration limit is exceeded for any metal, refer to Steps 8.
- If the "conservative" kiln dust metal concentration limit is not exceeded, continue with the daily or weekly monitoring (Step 5) for the duration of interim status.
- Conduct quarterly enrichment factor verification tests, as described in Step 6.
- (6) Conduct quarterly enrichment factor verification tests.
- After certification of compliance with the metals standards, a facility must conduct quarterly enrichment factor verification tests every three months for the duration of interim status. The first quarterly test must be completed within three months of certification (or recertification). Each subsequent quarterly test must be completed within three months of the preceding quarterly test. Failure to meet this schedule is a violation.
- Simultaneous stack samples and kiln dust samples must be collected.
- Follow the same procedures and sample at the same locations as were used for kiln dust samples and stack samples collected to determine the enrichment factors (as discussed in Step 2).
- At least three single (noncomposited) runs are required. These tests need not be conducted under the operating conditions of the initial compliance test; however, the facility must operate under the following conditions:
 - It must operate at compliance test production rate.
 - It must burn hazardous waste during the test, and for the 2-day period immediately preceding the test, such that the feedrate of each metal for pumpable and total hazardous wastes consist of at least 25% of the operating limits established during the compliance test.
 - It must remain in compliance with all compliance parameters (see § 266.103(c)(1)).
 - It must follow a normal schedule of kiln dust recharging.
 - It must generate normal marketable product from normal raw materials during the tests.
- (7) Conduct a statistical test to determine if the enrichment factors measured in the quarterly verification tests have increased significantly from the enrichment factors determined in the tests conducted in Step 2. The enrichment factors have increased significantly if all three of the following criteria are met:
 - By applying the t-test described in appendix A, it is determined that the enrichment factors measured in the quarterly tests are not taken from the same population as the enrichment factors measured in the Step 2 tests;
 - The EF_{hex} calculated for the combined data sets (i.e., the quarterly test data and the original Step 2 test data) according to the t-distribution (described in appendix A) is more than 10% higher than the EF_{hex} based on the enrichment factors previously measured in Step 2; and
 - The highest measured kiln dust metal concentration recorded in the previous quarter is more than 10% of the "violation" kiln dust concentration limit that would be calculated from the combined EF_{hex} .
- If the enrichment factors have increased significantly, the tests to determine the enrichment factors must be repeated (refer to Step 11). If the enrichment factors have not increased significantly, continue to use the kiln dust metal concentration limits based on the enrichment factors previously measured in Step 2, and continue with the daily and/or weekly monitoring described in Step 5.
- (8) If the "conservative" kiln dust metal concentration limit was exceeded for any metal in any single analysis of the "required" kiln dust sample, the "spare" samples corresponding to the same period may be analyzed to determine if the exceedance was due to a sampling or analysis error.
- If no "spare" samples were taken, refer to Step 9.
- If the average of all the samples for a given day (or week, as applicable) (including the "required" sample and the "spare" sample) does not exceed the "conservative" kiln dust metal concentration limit, no corrective measures are necessary; continue with the daily and/or weekly monitoring as described in Step 5.
- If the average of all the samples for a given day (or week, as applicable) exceeds the "conservative" kiln dust metal concentration limit, but the average of the "spare" samples is below the "conservative" kiln dust metal concentration limit, apply the Q-test, described in appendix A, to determine whether the "required" sample concentration can be judged as an outlier.
- If the "required" sample concentration is judged an outlier, no corrective measures are necessary; continue with the daily and/or weekly monitoring described in Step 5.
- If the "required" sample concentration is not judged an outlier, refer to Step 9.
- (9) Determine if the "violation" kiln dust metal concentration has been exceeded based on either the average of all the samples collected during the 24-hour period in question, or if discarding an outlier can be statistically justified by the Q-test described in

"safe" enrichment factor is a conservatively high estimate of the enrichment factor (the ratio of the emitted metal concentration to the metal concentration in the collected kiln dust). The "safe" enrichment factor must be calculated from either conservative default values, or engineering judgement.

—Analysis of hazardous waste feedstreams.
—Daily and/or weekly monitoring of kiln dust concentrations for continuing compliance.
(2) Determine the "safe" enrichment factor for precompliance. In this context, the

return to Step 2). During this period, the facility must reduce the feed rate of the metal in violation by 50%. If the facility has not completed the recertification process within this period, it must stop burning or obtain an extension. Hazardous waste burning may resume only when the recertification process (ending with Step 4) has been completed.
• Meanwhile, the facility must continue with daily kiln dust metals monitoring (Step 5) and must remain in compliance with the "violation" kiln dust metal concentration limits (Step 9).

10.6 Precompliance Procedures

Cement kilns and other industrial furnaces that recycle emission control residue back into the furnace must comply with the same certification schedules and procedures (with the few exceptions described below) that apply to other boilers and industrial furnaces. These schedules and procedures, as set forth in § 266.103, require no later than the effective date of the rule, each facility submit a certification which establishes precompliance limits for a number of compliance parameters (see § 266.103(b)(3)), and that each facility immediately begin to operate under these limits.

These precompliance limits must ensure that interim status emissions limits for hazardous metals, particulate matter, HCl, and Cl₂ are not likely to be exceeded. Determination of the values of the precompliance limits must be made based on either (1) conservative default assumptions provided in this Methods Manual, or (2) engineering judgement.

The flowchart for implementing the precompliance procedures is shown in Figure 10.6-1. The step-by-step precompliance implementation procedure is described below. The precompliance implementation procedures and numbering scheme are similar to those used for the compliance procedures described in Subsection 10.5.

- (1) Prepare initial limits and test plans.
- Determine the Tier III metal emission limit. The Tier II metal emission limit may also be used (see 40 CFR 266.106).
- Determine the applicable PM emission standard. This standard is the most stringent particulate emission standard that applies to the facility. A facility may elect to restrict itself to an even more stringent self-imposed PM emission standard, particularly if the facility finds that it is easier to control particulate emissions than to reduce the kiln dust concentration of a certain metal (i.e., lead).
- Determine which metals need to be monitored (i.e., all hazardous metals for which Tier III emission limits are lower than PM emission limits, assuming PM is pure metal).
- Follow the procedures described in SW-846 for preparing waste analysis plans for the following tasks:

appendix A, on the average of the remaining samples.

• If the "violation" kiln dust metal concentration limit has been exceeded, a violation of the metals controls under § 266.103(c) has occurred. Notify the Director that a violation has occurred. Hazardous waste may be burned for testing purposes for up to 720 operating hours to support a revised certification of compliance. Note that the Director may grant an extension of the hours of hazardous waste burning under § 266.103(c)(7) if additional burning time is needed to support a revised certification for reasons beyond the control of the owner or operator. Until a revised certification of compliance is submitted to the Director, the feedrate of the metals in violation in total and pumpable hazardous waste feeds is limited to 50% of the previous compliance test limits.

• If the "violation" kiln dust metal concentration has not been exceeded:
—If the exceedance occurred in a daily composite sample, refer to Step 10.
—If the exceedance occurred in a weekly composite sample, refer to Step 11.

(10) Determine if the "conservative" kiln dust metal concentration limit has been exceeded more than three times in the last 60 days.

• If not, log this exceedance and continue with the daily and/or weekly monitoring (Step 6).

• If so, the tests to determine the enrichment factors must be repeated (refer to Step 11).

• This determination is made separately for each metal. For example,

—Three exceedances for each of the ten hazardous metals are allowed within any 60-day period.

—Four exceedances of any single metal in any 60-day period is not allowed.

• This determination should be made daily, beginning on the first day of daily monitoring. For example, if four exceedances of any single metal occur in the first four days of daily monitoring, do not wait until the end of the 60-day period; refer immediately to Step 11.

(11) The tests to determine the enrichment factor must be repeated if: (1) More than three exceedances of the "conservative" kiln dust metal concentration limit occur within any 60 consecutive daily samples; (2) an extension of the "conservative" kiln dust metal concentration limit occurs in any weekly sample; or (3) a quarterly test indicates that the enrichment factors have increased significantly.

• The facility must notify the Director if these tests must be repeated.

• The facility has up to 720 hazardous waste-burning hours to redetermine the enrichment factors for the metal or metals in question and to recertify (beginning with a

dust metal concentration limit, no corrective measures are necessary; continue with the daily and/or weekly monitoring as described in Step 5.

- If the average of all the samples for a given day (or week, as applicable) exceeds the "conservative" kiln dust metal concentration limit, but the average of the "spare" samples is below the "conservative" kiln dust metal concentration limit, apply the Q-test, described in appendix A, to determine whether the "required" sample concentration can be judged as an outlier.
- If the "required" sample concentration is judged an outlier, no corrective measures are necessary; continue with the daily and/or weekly monitoring described in Step 5.
- If the "required" sample concentration is not judged an outlier, refer to Step 10.
- (8) This step does not apply to precompliance procedures.
- (10) Determine if the "conservative" kiln dust metal concentration limit has been exceeded more than three times in the last 60 days.
- If not, log this exceedance and continue with the daily and/or weekly monitoring (Step 5).
- If so, the tests to determine the enrichment factors must be repeated (refer to Step 11).
- This determination is made separately for each metal; for example:
 - Three exceedances for each of the ten hazardous metals are allowed within any 60-day period.
 - Four exceedances of any single metal in any 60-day period is not allowed.
- This determination should be made daily, beginning on the first day of daily monitoring. For example, if four exceedances of any single metal occur in the first four days of daily monitoring, do not wait until the end of the 60-day period; refer immediately to Step 11.
- (11) A revised certification of precompliance must be submitted to the Director (or certification of compliance must be submitted) if:
 - (1) More than three exceedances of the "conservative" kiln dust metal concentration limit occur within any 60 consecutive daily samples; or
 - (2) an exceedance of the "conservative" kiln dust metal concentration limit occurs in any weekly sample.
- The facility must notify the Director if a revised certification of precompliance must be submitted.
- The facility has up to 720 waste-burning hours to submit a certification of compliance or a revised certification of precompliance. During this period, the feed rate of the metal in violation must be reduced by 50%, in the case of a revised certification of precompliance, engineering judgement must be used to ensure that the "con-

$$S = \left[\frac{\sum_{i=1}^n (EF_i - EF)^2}{n-1} \right]^{\frac{1}{2}} \quad (5)$$

t_c is a function of the number of samples and the confidence level that is desired. It increases in value as the sample size decreases and the confidence level increases. The 95% confidence level is used in this method to calculate the "violation" kiln dust metal concentration limit; and the 99% confidence level is sometimes used to calculate the "conservative" kiln dust metal concentration limit. Values of t_c are shown in table A-1 for various degrees of freedom (degrees of freedom = sample size - 1) at the 95% and 99% confidence levels. As the sample size approaches infinity, the normal distribution is approached.

A.2 Comparison of Enrichment Factor Groups
To determine if the enrichment factors measured in the quarterly tests are significantly different from the enrichment factors determined in the Initial Step 2 tests, the t -test is used. In this test, the value t_{max} :

$$t_{max} = \frac{EF_1 - EF_2}{\sigma_t \left(\frac{1}{n_1} + \frac{1}{n_2} \right)^{\frac{1}{2}}} \quad (6)$$

TABLE A-1.—T-DISTRIBUTION

n-1 or n+n ₂ -2	t ₉₅	t ₉₉
1	6.31	31.82
2	2.92	6.96
3	2.35	4.54
4	2.13	3.75
5	2.02	3.36
6	1.94	3.14
7	1.90	3.00
8	1.86	2.90
9	1.83	2.82
10	1.81	2.76
11	1.80	2.72
12	1.78	2.68
13	1.77	2.65
14	1.76	2.62
15	1.75	2.60
16	1.75	2.58
17	1.74	2.57
18	1.73	2.55
19	1.73	2.54
20	1.72	2.53
25	1.71	2.48
30	1.69	2.42
40	1.67	2.39
60	1.66	2.36
120	1.645	2.33

$$\sigma_t = \left(\frac{(n_1 - 1)S_1^2 + (n_2 - 1)S_2^2}{n_1 + n_2 - 2} \right)^{\frac{1}{2}} \quad (7)$$

is compared to t_{max} at the desired confidence level. The 95% confidence level is used in this method. Values of t_{max} are shown in table A-1 for various degrees of freedom (degrees of freedom $n_1 + n_2 - 2$) at the 95% and 99% confidence levels. If t_{max} is greater than t_{95} , it can be concluded with 95% confidence that the two groups are not from the same population.

A.3 Rejection of Data
If the concentration of any hazardous metal in the "required" kiln dust sample exceeds the kiln dust metal concentration limit, the "spare" samples are analyzed. If the average of the combined "required" and "spare" values is still above the limit, a statistical test is used to decide if the upper value can be rejected.
The "Q-test" is used to determine if a data point can be rejected. The difference between the questionable result and its neighbor is divided by the spread of the entire data set. The resulting ratio, Q_{max} , is then compared with rejection values that are critical for a particular degree of confidence, where Q_{max} is:

$$Q_{max} = \frac{DMC_{upper} - DMC_{min}}{DMC_{upper} - DMC_{lower}} \quad (8)$$

The 90% confidence level for data rejection is used in this method. Table A-2 provides the values of Q_{max} at the 90% confidence level. If Q_{max} is larger than Q_{crit} , the data point can be discarded. Only one data point from a sample group can be rejected using this method.

TABLE A-2.—CRITICAL VALUES FOR USE IN THE Q-TEST

n	Q _{crit}
3	0.94
4	0.76
5	0.64
6	0.56
7	0.51
8	0.47
9	0.44
10	0.41

[56 FR 35692, July 17, 1991 as amended 56 FR 42512, 42516, Aug. 27, 1991; 57 FR 30568, Aug. 25, 1992; 57 FR 41999, Sept. 30, 1992]

APPENDIX X—[RESERVED]

APPENDIX XI TO PART 266—LEAD-BEARING MATERIALS THAT MAY BE PROCESSED IN EXEMPT LEAD SMELTERS

A. *Exempt Lead-Bearing Materials When Generated or Originally Produced By Lead-Associated Industries¹*

- Acid dumpfill solids
- Sump mud
- Materials from laboratory analyses
- Acid filters
- Baghouse bags
- Clothing (e.g., coveralls, aprons, shoes, hats, gloves)
- Sweepings
- Air filter bags and cartridges
- Respiratory cartridge filters
- Shop abrasives
- Stacking boards
- Waste shipping containers (e.g., cartons, bags, drums, cardboard)
- Paper hand towels
- Wiping rags and sponges
- Contaminated pallets
- Water treatment sludges, filter cakes, residues, and solids
- Emission control dusts, sludges, filter cakes, residues, and solids from lead-associated industries (e.g., K699 and D008 wastes)
- Spent grids, posts, and separators
- Spent batteries
- Lead oxide and lead oxide residues
- Lead plates and groups
- Spent battery cases, covers, and vents
- Pasting belts
- Water filter media
- Cheesecloth from pasting rollers
- Pasting additive bags
- Asphalt paving materials

B. *Exempt Lead-Bearing Materials When Generated or Originally Produced By Any Industry*

- Charging jumpers and clips
- Platen abrasive
- Fluff from lead wire and cable casings
- Lead-based pigments and compounding pigment dust

[56 FR 42517, Aug. 27, 1991]

¹ Lead-associated industries are lead smelters, lead-acid battery manufacturing, and lead chemical manufacturing (e.g., manufacturing of lead oxide or other lead compounds).

APPENDIX XII TO PART 266—NICKEL OR CHROMIUM-BEARING MATERIALS THAT MAY BE PROCESSED IN EXEMPT NICKEL-CHROMIUM RECOVERY FURNACES

A. *Exempt Nickel or Chromium-Bearing Materials When Generated by Manufacturers or Users of Nickel, Chromium, or Iron*

- Baghouse bags
- Raney nickel catalyst
- Floor sweepings
- Air filters
- Electroplating bath filters
- Wastewater filter media
- Wood pallets
- Disposable clothing (coveralls, aprons, hats, and gloves)
- Laboratory samples and spent chemicals
- Shipping containers and plastic liners from containers or vehicles used to transport nickel or chromium-containing wastes
- Respirator cartridge filters
- Paper hand towels

B. *Exempt Nickel or Chromium-Bearing Materials When Generated by Any Industry*

- Electroplating wastewater treatment sludges (P006)
- Nickel and/or chromium-containing solutions
- Nickel, chromium, and iron catalysts
- Nickel-cadmium and nickel-iron batteries
- Filter cake from wet scrubber system water treatment plants in the specialty steel industry¹
- Filter cake from nickel-chromium alloy pickling operations¹

[56 FR 42517, Aug. 27, 1991]

APPENDIX XIII TO PART 266—MERCURY BEARING WASTES THAT MAY BE PROCESSED IN EXEMPT MERCURY RECOVERY UNITS

These are exempt mercury-bearing materials with less than 500 ppm of 40 CFR Part 261, appendix VIII organic constituents when generated by manufacturers or users of mercury or mercury products.

- 1. Activated carbon
- 2. Decomposer graphite
- 3. Wood
- 4. Paper
- 5. Protective clothing
- 6. Sweepings
- 7. Respiratory cartridge filters
- 8. Cleanup articles

¹ If a hazardous waste under an authorized State program.

- 9. Plastic bags and other contaminated containers
- 10. Laboratory and process control samples
- 11. K106 and other wastewater treatment plant sludge and filter cake
- 12. Mercury cell sump and tank sludge
- 13. Mercury cell process solids
- 14. Recoverable levels of mercury contained in soil

[59 FR 49042, Sept. 19, 1994]

PART 267—[RESERVED]

PART 268—LAND DISPOSAL RESTRICTIONS

Subpart A—General

- Sec.
- 268.1 Purpose, scope, and applicability.
- 268.2 Definitions applicable in this part.
- 268.3 Dilution prohibited as a substitute for treatment.
- 268.4 Treatment surface impoundment exemption.
- 268.5 Procedures for case-by-case extensions to an effective date.
- 268.6 Petitions to allow land disposal of a waste prohibited under subpart C of part 268.
- 268.7 Waste analysis and record-keeping.
- 268.8 Landfill and surface impoundment disposal restrictions.
- 268.9 Special rules regarding wastes that exhibit a characteristic.

Subpart B—Schedule for Land Disposal Prohibition and Establishment of Treatment Standards

- 268.10 Identification of wastes to be evaluated by August 6, 1989.
- 268.11 Identification of wastes to be evaluated by June 8, 1989.
- 268.12 Identification of wastes to be evaluated by May 8, 1990.
- 268.13 Schedule for wastes identified or listed after November 8, 1994.
- 268.14 Surface impoundment exemptions.

Subpart C—Prohibitions on Land Disposal

- 268.30 Waste specific prohibitions—Solvent wastes.
- 268.31 Waste specific prohibitions—Dioxin-containing wastes.
- 268.32 Waste specific prohibitions—California list wastes.
- 268.33 Waste specific prohibitions—First third wastes.
- 268.34 Waste specific prohibitions—Second third wastes.
- 268.35 Waste specific prohibitions—Third third wastes.

- 268.36 Waste specific prohibitions—newly listed wastes.
- 268.37 Waste specific prohibitions—ignitable and corrosive characteristic wastes whose treatment standards were vacated.
- 268.38 Waste specific prohibitions—newly identified organic toxicity characteristic wastes and newly listed coke by-product and chlorotoluene production wastes.

Subpart D—Treatment Standards

- 268.40 Applicability of treatment standards.
- 268.41 Treatment standards expressed as concentrations in waste extract.
- 268.42 Treatment standards expressed as specified technologies.
- 268.43 Treatment standards expressed as waste concentrations.
- 268.44 Variance from a treatment standard.
- 268.45 Treatment standards for hazardous debris.
- 268.46 Alternative treatment standards based on HTMR.
- 268.48 Universal treatment standards.

Subpart E—Prohibitions on Storage

- 268.50 Prohibitions on storage of restricted wastes.

APPENDIX I TO PART 268—TOXICITY CHARACTERISTIC LEACHING PROCEDURE (TCLP) [NOTE]

APPENDIX II TO PART 268—TREATMENT STANDARDS (AS CONCENTRATIONS IN THE TREATMENT RESIDUAL EXTRACT)

APPENDIX III TO PART 268—LIST OF HALOGENATED ORGANIC COMPOUNDS REGULATED UNDER §268.32

APPENDIX IV TO PART 268—WASTES EXCLUDED FROM LAB PACKS UNDER THE ALTERNATIVE TREATMENT STANDARDS OF §268.42(c)

APPENDIX V TO PART 268—[Reserved]

APPENDIX VI TO PART 268—RECOMMENDED TECHNOLOGIES TO ACHIEVE DEACTIVATION OF CHARACTERISTICS IN SECTION 268.42

APPENDIX VII TO PART 268—EFFECTIVE DATES OF SURFACE DISPOSAL WASTES REGULATED IN THE LDRA

APPENDIX VIII TO PART 268—NATIONAL CAPACITY LDR VARIANCES FOR UIC WASTES COMPREHENSIVE LIST

APPENDIX IX TO PART 268—EXTRACTION PROCEDURES (EP) TOXICITY TEST METHOD AND STRUCTURAL INTEGRITY TEST (METHOD 1310)

APPENDIX X TO PART 268—RECORDKEEPING, NOTIFICATION, AND/OR CERTIFICATION REQUIREMENTS

AUTHORITY: 42 U.S.C. 6905, 6912(a), 6921, and 6924.

(g) If incompatible wastes, or incompatible wastes and materials will be placed in a waste pile, an explanation of how § 264.257 will be complied with:

(h) A description of how hazardous waste residues and contaminated materials will be removed from the waste pile at closure, as required under § 264.258(a). For any waste not to be removed from the waste pile upon closure, the owner or operator must submit detailed plans and an engineering report describing how § 264.310 (a) and (b) will be complied with. This information should be included in the closure plan and, where applicable, the post-closure plan submitted under § 270.14(b)(13).

(i) A waste management plan for EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027 describing how a waste pile that is not enclosed (as defined in § 264.250(c)) is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.259. This submission must address the following items as specified in § 264.259:

- (1) The volume, physical, and chemical characteristics of the wastes to be disposed in the waste pile, including their potential to migrate through soil or to volatilize or escape into the atmosphere;
- (2) The attenuative properties of underlying and surrounding soils or other materials;
- (3) The mobilizing properties of other materials co-disposed with these wastes; and
- (4) The effectiveness of additional treatment, design, or monitoring techniques.

[46 FR 14228, Apr. 1, 1983, as amended at 50 FR 2066, Jan. 14, 1985; 50 FR 28752, July 15, 1985; 57 FR 3496, Jan. 29, 1992]

§ 270.19 Specific part B information requirements for incinerators.

Except as § 264.340 of this chapter provides otherwise, owners and operators of facilities that incinerate hazardous waste must fulfill the requirements of (a), (b), or (c) of this section.

(a) When seeking an exemption under § 264.340 (b) or (c) of this chapter (Ignitable, Corrosive, or Reactive wastes only):

(1) Documentation that the waste is listed as a hazardous waste in part 261, subpart D of this chapter, solely because it is ignitable (Hazard Code I) or corrosive (Hazard Code C) or both; or

(2) Documentation that the waste is listed as a hazardous waste in part 261, subpart D of this chapter, solely because it is reactive (Hazard Code R) for characteristics other than those listed in § 261.23(a) (4) and (5) of this chapter, and will not be burned when other hazardous wastes are present in the combustion zone; or

(3) Documentation that the waste is a hazardous waste solely because it possesses the characteristic of ignitability, corrosivity, or both, as determined by the tests for characteristics of hazardous waste under part 261, subpart C of this chapter; or

(4) Documentation that the waste is a hazardous waste solely because it possesses the reactivity characteristics listed in § 261.23(a) (1), (2), (3), (6), (7), or (8) of this chapter, and that it will not be burned when other hazardous wastes are present in the combustion zone; or

(b) Submit a trial burn plan or the results of a trial burn, including all required determinations, in accordance with § 270.62; or

(c) In lieu of a trial burn, the applicant may submit the following information:

- (1) An analysis of each waste or mixture of wastes to be burned including:
 - (i) Heat value of the waste in the form and composition in which it will be burned.
 - (ii) Viscosity (if applicable), or description of physical form of the waste.
 - (iii) An identification of any hazardous organic constituents listed in part 261, appendix VIII, of this chapter, which are present in the waste to be burned, except that the applicant need not analyze for constituents listed in part 261, appendix VIII, of this chapter which would reasonably not be expected to be found in the waste. The constituents excluded from analysis must be identified and the basis for their exclusion stated. The waste analysis must rely on analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of

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this chapter and § 270.6, or their equivalent.

(iv) An approximate quantification of the hazardous constituents identified in the waste, within the precision produced by the analytical methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter and § 270.6.

(v) A quantification of those hazardous constituents in the waste which may be designated as POHC's based on data submitted from other trial or operational burns which demonstrate compliance with the performance standards in § 264.343 of this chapter.

(2) A detailed engineering description of the incinerator, including:

- (i) Manufacturer's name and model number of incinerator.
- (ii) Type of incinerator.
- (iii) Linear dimension of incinerator unit including cross sectional area of combustion chamber.
- (iv) Description of auxiliary fuel system (type/feed).

(v) Capacity of prime mover.

(vi) Description of automatic waste feed cutoff system(s).

(vii) Stack gas monitoring and pollution control monitoring system.

(viii) Nozzle and burner design.

(ix) Construction materials.

(x) Location and description of temperature, pressure, and flow indicating devices and control devices.

(3) A description and analysis of the waste to be burned compared with the waste for which data from operational or trial burns are provided to support the contention that a trial burn is not needed. The data should include those items listed in paragraph (c)(1) of this section. This analysis should specify the POHC's which the applicant has identified in the waste for which a permit is sought, and any differences from the POHC's in the waste for which burn data are provided.

(4) The design and operating conditions of the incinerator unit to be used, compared with that for which comparative burn data are available.

(5) A description of the results submitted from any previously conducted trial burn(s) including:

(i) Sampling and analysis techniques used to calculate performance standards in § 264.343 of this chapter.

(ii) Methods and results of monitoring temperatures, waste feed rates, carbon monoxide, and an appropriate indicator of combustion gas velocity (including a statement concerning the precision and accuracy of this measurement).

(6) The expected incinerator operation information to demonstrate compliance with §§ 264.343 and 264.345 of this chapter including:

(i) Expected carbon monoxide (CO) level in the stack exhaust gas.

(ii) Waste feed rate.

(iii) Combustion zone temperature.

(iv) Indication of combustion gas velocity.

(v) Expected stack gas volume, flow rate, and temperature.

(vi) Computed residence time for waste in the combustion zone.

(vii) Expected hydrochloric acid removal efficiency.

(viii) Expected fugitive emissions and their control procedures.

(ix) Proposed waste feed cut-off limits based on the identified significant operating parameters.

(7) Such supplemental information as the Director finds necessary to achieve the purposes of this paragraph.

(8) Waste analysis data, including that submitted in paragraph (c)(1) of this section, sufficient to allow the Director to specify as permit Principal Organic Hazardous Constituents (permit POHC's) those constituents for which destruction and removal efficiencies will be required.

(d) The Director shall approve a permit application without a trial burn if he finds that:

- (1) The wastes are sufficiently similar; and
- (2) The incinerator units are sufficiently similar, and the data from other trial burns are adequate to specify (under § 264.345 of this chapter) operating conditions that will ensure that the performance standards in § 264.343 of this chapter will be met by the incinerator.

[46 FR 14228, Apr. 1, 1983, as amended at 50 FR 46051, Aug. 31, 1985]

§ 270.20 Specific part B information requirements for land treatment facilities.

Except as otherwise provided in § 264.1, owners and operators of facilities that use land treatment to dispose of hazardous waste must provide the following additional information:

(a) A description of plans to conduct a treatment demonstration as required under § 264.272. The description must include the following information:

(1) The wastes for which the demonstration will be made and the potential hazardous constituents in the waste;

(2) The data sources to be used to make the demonstration (e.g., literature, laboratory data, field data, or operating data);

(3) Any specific laboratory or field test that will be conducted, including:

(i) The type of test (e.g., column leaching, degradation);

(ii) Materials and methods, including analytical procedures;

(iii) Expected time for completion;

(iv) Characteristics of the unit that will be simulated in the demonstration, including treatment zone characteristics, climatic conditions, and operating practices.

(b) A description of a land treatment program, as required under § 264.271. This information must be submitted with the plans for the treatment demonstration, and updated following the treatment demonstration. The land treatment program must address the following items:

(1) The wastes to be land treated;

(2) Design measures and operating practices necessary to maximize treatment in accordance with § 264.273(a) including:

(i) Waste application method and rate;

(ii) Measures to control soil pH;

(iii) Enhancement of microbial or chemical reactions;

(iv) Control of moisture content;

(3) Provisions for unsaturated zone monitoring, including:

(i) Sampling equipment, procedures, and frequency;

(ii) Procedures for selecting sampling locations;

(iii) Analytical procedures;

(iv) Chain of custody control;

how the requirements of § 264.276(b) will be complied with;

(f) A description of the vegetative cover to be applied to closed portions of the facility, and a plan for maintaining such cover during the post-closure care period, as required under §§ 264.280(a)(8) and 264.280(c)(2). This information should be included in the closure plan and, where applicable, the post-closure care plan submitted under § 270.14(b)(13);

(g) If ignitable or reactive wastes will be placed in or on the treatment zone, an explanation of how the requirements of § 264.281 will be complied with;

(h) If incompatible wastes, or incompatible wastes and materials, will be placed in or on the same treatment zone, an explanation of how § 264.282 will be complied with.

(i) A waste management plan for EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027 describing how a land treatment facility is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.283. This submission must address the following items as specified in § 264.283:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

(48 FR 14228, Apr. 1, 1983; 48 FR 30114, June 30, 1983, as amended at 50 FR 2006, Jan. 14, 1985)

§ 270.21 Specific part B information requirements for landfills.

Except as otherwise provided in § 264.1, owners and operators of facilities that dispose of hazardous waste in landfills must provide the following additional information:

(a) A list of the hazardous wastes placed or to be placed in each landfill or landfill cell;

(b) Detailed plans and an engineering report describing how the landfill is de-

signed and is or will be constructed, operated, and maintained to meet the requirements of §§ 264.19, 264.301, 264.302, and 264.303 of this chapter, addressing the following items:

(1)(i) The liner system (except for an existing portion of a landfill), if the landfill must meet the requirements of § 264.301(a) of this chapter. If an exemption from the requirement for a liner is sought as provided by § 264.301(b) of this chapter, submit detailed plans, and engineering and hydrogeological reports, as appropriate, describing alternate designs and operating practices that will, in conjunction with location aspects, prevent the migration of any hazardous constituents into the ground water or surface water at any future time;

(ii) The double liner and leak (leachate) detection, collection, and removal system, if the landfill must meet the requirements of § 264.301(c) of this chapter. If an exemption from the requirements for double liners and a leak detection, collection, and removal system or alternative design is sought as provided by § 264.301(d), (e), or (f) of this chapter, submit appropriate information.

(iii) If the leak detection system is located in a saturated zone, submit detailed plans and an engineering report explaining the leak detection system design and operation, and the location of the saturated zone in relation to the leak detection system;

(iv) The construction quality assurance (CQA) plan if required under § 264.19 of this chapter;

(v) Proposed action leakage rate, with rationale. If required under § 264.302 of this chapter, and response action plan, if required under § 264.303 of this chapter;

(2) Control of run-on;

(3) Control of run-off;

(4) Management of collection and holding facilities associated with run-on and run-off control systems; and

(5) Control of wind dispersal of particulate matter, where applicable;

(c) A description of how each landfill, including the double liner system, leachate collection and removal system, leak detection system, cover system, and appurtenances for control of run-on and run-off, will be inspected in order to meet the requirements of

§ 264.303(a), (b), and (c) of this chapter. This information must be included in the inspection plan submitted under § 270.14(b)(5);

(d) A description of how each landfill, including the liner and cover systems, will be inspected in order to meet the requirements of § 264.303 (a) and (b). This information should be included in the inspection plan submitted under § 270.14(b)(5).

(e) Detailed plans and an engineering report describing the final cover which will be applied to each landfill or landfill cell at closure in accordance with § 264.310(a), and a description of how each landfill will be maintained and monitored after closure in accordance with § 264.310(b). This information should be included in the closure and post-closure plans submitted under § 270.14(b)(3).

(f) If ignitable or reactive wastes will be landfilled, an explanation of how the standards of § 264.312 will be complied with;

(g) If incompatible wastes, or incompatible wastes and materials will be landfilled, an explanation of how § 264.313 will be complied with;

(h) If bulk or non-containerized liquid waste or wastes containing free liquids is to be landfilled prior to May 8, 1995, an explanation of how the requirements of § 264.314(a) will be complied with;

(i) If containers of hazardous waste are to be landfilled, an explanation of how the requirements of § 264.315 or § 264.316, as applicable, will be complied with.

(j) A waste management plan for EPA Hazardous Waste Nos. F020, F021, F022, F023, F026, and F027 describing how a landfill is or will be designed, constructed, operated, and maintained to meet the requirements of § 264.317. This submission must address the following items as specified in § 264.317:

(1) The volume, physical, and chemical characteristics of the wastes, including their potential to migrate through soil or to volatilize or escape into the atmosphere;

(2) The attenuative properties of underlying and surrounding soils or other materials;

(3) The mobilizing properties of other materials co-disposed with these wastes; and

(4) The effectiveness of additional treatment, design, or monitoring techniques.

[40 FR 14228, Apr. 1, 1983; 48 FR 30114, June 30, 1983, as amended at 50 FR 2006, Jan. 14, 1985; 50 FR 28752, July 15, 1985; 57 FR 3496, Jan. 29, 1992]

§ 270.22 Specific part B information requirements for boilers and industrial furnaces burning hazardous waste.

(a) *Trial burns—(1) General.* Except as provided below, owners and operators that are subject to the standards to control organic emissions provided by § 266.104 of this chapter, standards to control particulate matter provided by § 266.105 of this chapter, standards to control metals emissions provided by § 266.106 of this chapter, or standards to control hydrogen chloride or chlorine gas emissions provided by § 266.107 of this chapter must conduct a trial burn to demonstrate conformance with those standards and must submit a trial burn plan or the results of a trial burn, including all required determinations, in accordance with § 270.66.

(i) A trial burn to demonstrate conformance with a particular emission standard may be waived under provisions of § 266.104 through 266.107 of this chapter and paragraphs (a)(2) through (a)(5) of this section; and

(ii) The owner or operator may submit data in lieu of a trial burn, as prescribed in paragraph (a)(6) of this section.

(2) *Waiver of trial burn for DRE—(1) Boilers operated under special operating requirements.* When seeking to be permitted under §§ 266.104(a)(4) and 266.110 of this chapter that automatically waive the DRE trial burn, the owner or operator of a boiler must submit documentation that the boiler operates under the special operating requirements provided by § 266.110 of this chapter.

(ii) *Boilers and industrial furnaces burning low risk waste.* When seeking to be permitted under the provisions for low risk waste provided by §§ 266.104(a)(5) and 266.109(a) of this

chapter that waive the DRE trial burn, the owner or operator must submit:

(A) Documentation that the device is operated in conformance with the requirements of § 266.109(a)(1) of this chapter.

(B) Results of analyses of each waste to be burned, documenting the concentrations of nonmetal compounds listed in appendix VIII of part 261 of this chapter, except for those constituents that would reasonably not be expected to be in the waste. The constituents excluded from analysis must be identified and the basis for their exclusion explained. The analysis must rely on analytical techniques specified in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (incorporated by reference, see § 260.11).

(C) Documentation of hazardous waste firing rates and calculations of reasonable, worst-case emission rates of each constituent identified in paragraph (a)(2)(i)(B) of this section using procedures provided by § 266.109(a)(2)(ii) of this chapter.

(D) Results of emissions dispersion modeling for emissions identified in paragraphs (a)(2)(i)(C) of this section using modeling procedures prescribed by § 266.104(h) of this chapter. The Director will review the emission modeling conducted by the applicant to determine conformance with these procedures. The Director will either approve the modeling or determine that alternate or supplementary modeling is appropriate.

(E) Documentation that the maximum annual average ground level concentration of each constituent identified in paragraph (a)(2)(i)(B) of this section quantified in conformance with paragraph (a)(2)(i)(D) of this section does not exceed the allowable ambient level established in appendices IV or V of part 266. The acceptable ambient concentration for emitted constituents for which a specific Reference Air Concentration has not been established in appendix IV or Risk-Specific Dose has not been established in appendix V is 0.1 micrograms per cubic meter, as noted in the footnote to appendix IV.

(3) *Waiver of trial burn for metals.* When seeking to be permitted under the Tier I or adjusted Tier I metals feed rate screening limits provided by

§ 266.106 (b) and (c) of this chapter that control metals emissions without requiring a trial burn, the owner or operator must submit:

(i) Documentation of the feed rate of hazardous waste, other fuels, and industrial furnace feed stocks;

(ii) Documentation of the concentration of each metal controlled by § 266.106 (b) or (c) of this chapter in the hazardous waste, other fuels, and industrial furnace feedstocks, and calculations of the total feed rate of each metal;

(iii) Documentation of how the applicant will ensure that the Tier I feed rate screening limits provided by § 266.106 (b) or (c) of this chapter will not be exceeded during the averaging period provided by that paragraph;

(iv) Documentation to support the determination of the terrain-adjusted effective stack height, good engineering practice stack height, terrain type, and land use as provided by § 266.106 (b)(3) through (b)(5) of this chapter;

(v) Documentation of compliance with the provisions of § 266.106(b)(6), if applicable, for facilities with multiple stacks;

(vi) Documentation that the facility does not fail the criteria provided by § 266.106(b)(7) for eligibility to comply with the screening limits; and

(vii) Proposed sampling and metals analysis plan for the hazardous waste, other fuels, and industrial furnace feed stocks.

(4) *Waiver of trial burn for particulate matter.* When seeking to be permitted under the low risk waste provisions of § 266.109(b) which waives the particulate standard and trial burn to demonstrate conformance with the particulate standard, applicants must submit documentation supporting conformance with paragraphs (a)(2)(ii) and (a)(3) of this section.

(5) *Waiver of trial burn for HCl and Cl₂.* When seeking to be permitted under the Tier I (or adjusted Tier I) feed rate screening limits for total chloride and chlorine provided by § 266.107 (b)(1) and (c) of this chapter that control emissions of hydrogen chloride (HCl) and chlorine gas (Cl₂) without requiring a trial burn, the owner or operator must submit:

(i) Documentation of the feed rate of hazardous waste, other fuels, and industrial furnace feed stocks;

(ii) Documentation of the levels of total chloride and chlorine in the hazardous waste, other fuels, and industrial furnace feedstocks, and calculations of the total feed rate of total chloride and chlorine;

(iii) Documentation of how the applicant will ensure that the Tier I (or adjusted Tier I) feed rate screening limits provided by § 266.107 (b)(1) or (e) of this chapter will not be exceeded during the averaging period provided by that paragraph;

(iv) Documentation to support the determination of the terrain-adjusted effective stack height, good engineering practice stack height, terrain type, and land use as provided by § 266.107(b)(3) of this chapter;

(v) Documentation of compliance with the provisions of § 266.107(b)(4), if applicable, for facilities with multiple stacks;

(vi) Documentation that the facility does not fall the criteria provided by § 266.107(b)(3) for eligibility to comply with the screening limits; and

(vii) Proposed sampling and analysis plan for total chloride and chlorine for the hazardous waste, other fuels, and industrial furnace feedstocks.

(6) *Data in lieu of trial burn.* The owner or operator may seek an exemption from the trial burn requirements to demonstrate conformance with §§ 266.104 through 266.107 of this chapter and § 270.66 by providing the information required by § 270.66 from previous compliance testing of the device in conformance with § 266.103 of this chapter, or from compliance testing or trial or operational burns of similar boilers or industrial furnaces burning similar hazardous wastes under similar conditions. If data from a similar device is used to support a trial burn waiver, the design and operating information required by § 270.66 must be provided for both the similar device and the device to which the data is to be applied, and a comparison of the design and operating information must be provided. The Director shall approve a permit application without a trial burn if he finds that the hazardous wastes are sufficiently similar, the devices are suffi-

ciently similar, the operating conditions are sufficiently similar, and the data from other compliance tests, trial burns, or operational burns are adequate to specify (under § 266.102 of this chapter) operating conditions that will ensure conformance with § 266.102(c) of this chapter. In addition, the following information shall be submitted:

(i) For a waiver from any trial burn: (A) A description and analysis of the hazardous waste to be burned compared with the hazardous waste for which data from compliance testing, or operational or trial burns are provided to support the contention that a trial burn is not needed;

(B) The design and operating conditions of the boiler or industrial furnace to be used, compared with that for which comparative burn data are available; and

(C) Such supplemental information as the Director finds necessary to achieve the purposes of this paragraph.

(ii) For a waiver of the DRE trial burn, the basis for selection of POHCs used in the other trial or operational burns which demonstrate compliance with the DRE performance standard in § 266.104(a) of this chapter. This analysis should specify the constituents in appendix VIII, part 261 of this chapter, that the applicant has identified in the hazardous waste for which a permit is sought, and any differences from the POHCs in the hazardous waste for which burn data are provided.

(b) *Alternative HC limit for industrial furnaces with organic matter in raw materials.* Owners and operators of industrial furnaces requesting an alternative HC limit under § 266.104(f) of this chapter shall submit the following information at a minimum:

(1) Documentation that the furnace is designed and operated to minimize HC emissions from fuels and raw materials;

(2) Documentation of the proposed baseline flue gas HC (and CO) concentration, including data on HC (and CO) levels during tests when the facility produced normal products under normal operating conditions from normal raw materials while burning hazardous waste;

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(3) Test burn protocol to confirm the baseline HC (and CO) level including information on the type and flow rate of all feedstreams, point of introduction of all feedstreams, total organic carbon content (or other appropriate measure of organic content) of all nonfuel feedstreams, and operating conditions that affect combustion of fuel(s) and destruction of hydrocarbon emissions from nonfuel sources;

(4) Trial burn plan to:

(i) Demonstrate that flue gas HC (and CO) concentrations when burning hazardous waste do not exceed the baseline HC (and CO) level; and

(ii) Identify the types and concentrations of organic compounds listed in appendix VIII, part 261 of this chapter, that are emitted when burning hazardous waste in conformance with procedures prescribed by the Director;

(5) Implementation plan to monitor over time changes in the operation of the facility that could reduce the baseline HC level and procedures to periodically confirm the baseline HC level; and

(6) Such other information as the Director finds necessary to achieve the purposes of this paragraph.

(c) *Alternative metals implementation approach.* When seeking to be permitted under an alternative metals implementation approach under § 266.106(f) of this chapter, the owner or operator must submit documentation specifying how the approach ensures compliance with the metals emissions standards of § 266.106(c) or (d) and how the approach can be effectively implemented and monitored. Further, the owner or operator shall provide such other information that the Director finds necessary to achieve the purposes of this paragraph.

(d) *Automatic waste feed cutoff system.* Owners and operators shall submit information describing the automatic waste feed cutoff system, including any pre-alarm systems that may be used.

(e) *Direct transfer.* Owners and operators that use direct transfer operations to feed hazardous waste from transport vehicles (containers, as defined in § 266.111 of this chapter) directly to the boiler or industrial furnace shall submit information supporting conformance with the standards for direct

transfer provided by § 266.111 of this chapter.

(f) *Residues.* Owners and operators that claim that their residues are excluded from regulation under the provisions of § 266.112 of this chapter must submit information adequate to demonstrate conformance with those provisions.

(56 FR 7235, Feb. 21, 1991; 56 FR 32691, July 17, 1991)

§ 270.23 Specific part B information requirements for miscellaneous units.

Except as otherwise provided in § 264.600, owners and operators of facilities that treat, store, or dispose of hazardous waste in miscellaneous units must provide the following additional information:

(a) A detailed description of the unit being used or proposed for use, including the following:

(1) Physical characteristics, materials of construction, and dimensions of the unit;

(2) Detailed plans and engineering reports describing how the unit will be located, designed, constructed, operated, maintained, monitored, inspected, and closed to comply with the requirements of §§ 264.601 and 264.602; and

(3) For disposal units, a detailed description of the plans to comply with the post-closure requirements of § 264.603.

(b) Detailed hydrologic, geologic, and meteorologic assessments and land-use maps for the region surrounding the site that address and ensure compliance of the unit with each factor in the environmental performance standards of § 264.601. If the applicant can demonstrate that he does not violate the environmental performance standards of § 264.601 and the Director agrees with such demonstration, preliminary hydrologic, geologic, and meteorologic assessments will suffice.

(c) Information on the potential pathways of exposure of humans or environmental receptors to hazardous waste or hazardous constituents and on the potential magnitude and nature of such exposures.

(d) For any treatment unit, a report on a demonstration of the effectiveness

of the treatment based on laboratory or field data.

(e) Any additional information determined by the Director to be necessary for evaluation of compliance of the unit with the environmental performance standards of § 264.601.

§ 270.24 Specific part B information requirements for process vents.

Except as otherwise provided in § 264.1, owners and operators of facilities that have process vents to which subpart AA of part 264 applies must provide the following additional information:

(a) For facilities that cannot install a closed-vent system and control device to comply with the provisions of 40 CFR 264 subpart AA on the effective date that the facility becomes subject to the provisions of 40 CFR 264 or 265 subpart AA, an implementation schedule as specified in § 264.1033(a)(2).

(b) Documentation of compliance with the process vent standards in § 264.1032, including:

(1) Information and data identifying all affected process vents, annual throughput and operating hours of each affected unit, estimated emission rates for each affected vent and for the overall facility (i.e., the total emissions for all affected vents at the facility), and the approximate location within the facility of each affected unit (e.g., identify the hazardous waste management units on a facility plot plan).

(2) Information and data supporting estimates of vent emissions and emission reduction achieved by add-on control devices based on engineering calculations or source tests. For the purpose of determining compliance, estimates of vent emissions and emission reductions must be made using operating parameter values (e.g., temperatures, flow rates, or concentrations) that represent the conditions that exist when the waste management unit is operating at the highest load or capacity level reasonably expected to occur.

(3) Information and data used to determine whether or not a process vent is subject to the requirements of § 264.1032.

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system to comply with the requirements of § 264.1032, and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(d) Documentation of compliance with § 264.1033, including:

(1) A list of all information references and sources used in preparing the documentation.

(2) Records, including the dates, of each compliance test required by § 264.1033(k).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in § 264.1035(b)(4)(iii).

(4) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is or would be operating at the highest load or capacity level reasonably expected to occur.

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater unless the total organic emission limits of § 264.1032(a) for affected process vents at the facility can be attained by a control device involving vapor recovery at an efficiency less than 95 weight percent.

[55 FR 25518, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 270.25 Specific part B information requirements for equipment.

Except as otherwise provided in § 264.1, owners and operators of facilities that have equipment to which subpart BB of part 264 applies must provide the following additional information:

(a) For each piece of equipment to which subpart BB of part 264 applies:

(1) Equipment identification number and hazardous waste management unit identification.

(2) Approximate locations within the facility (e.g., identify the hazardous waste management unit on a facility plot plan).

(3) Type of equipment (e.g., a pump or pipeline valve).

(4) Percent by weight total organics in the hazardous waste stream at the equipment.

(5) Hazardous waste state at the equipment (e.g., gas/vapor or liquid).

(6) Method of compliance with the standard (e.g., "monthly leak detection and repair" or "equipped with dual mechanical seals").

(b) For facilities that cannot install a closed-vent system and control device to comply with the provisions of 40 CFR 264 subpart BB on the effective date that the facility becomes subject to the provisions of 40 CFR 264 or 265 subpart BB, an implementation schedule as specified in § 264.1033(a)(2).

(c) Where an owner or operator applies for permission to use a control device other than a thermal vapor incinerator, catalytic vapor incinerator, flare, boiler, process heater, condenser, or carbon adsorption system and chooses to use test data to determine the organic removal efficiency or the total organic compound concentration achieved by the control device, a performance test plan as specified in § 264.1035(b)(3).

(d) Documentation that demonstrates compliance with the equipment standards in §§ 264.1052 to 264.1059. This documentation shall contain the records required under § 264.1064. The Regional Administrator may request further documentation before deciding if compliance has been demonstrated.

(e) Documentation to demonstrate compliance with § 264.1060 shall include the following information:

(1) A list of all information references and sources used in preparing the documentation.

(2) Records, including the dates, of each compliance test required by § 264.1033(j).

(3) A design analysis, specifications, drawings, schematics, and piping and instrumentation diagrams based on the appropriate sections of "APTI Course 415: Control of Gaseous Emissions" (incorporated by reference as specified in § 260.11) or other engineering texts acceptable to the Regional Administrator that present basic control device design information. The design analysis shall address the vent stream characteristics and control device operation parameters as specified in § 264.1035(b)(4)(iii).

(4) A statement signed and dated by the owner or operator certifying that the operating parameters used in the design analysis reasonably represent the conditions that exist when the hazardous waste management unit is operating at the highest load or capacity level reasonably expected to occur.

(5) A statement signed and dated by the owner or operator certifying that the control device is designed to operate at an efficiency of 95 weight percent or greater.

[55 FR 25518, June 21, 1990, as amended at 56 FR 19290, Apr. 26, 1991]

§ 270.26 Special part B information requirements for drip pads.

Except as otherwise provided by § 264.1 of this chapter, owners and operators of hazardous waste treatment, storage, or disposal facilities that collect, store, or treat hazardous waste on drip pads must provide the following additional information:

(a) A list of hazardous wastes placed or to be placed on each drip pad.

(b) If an exemption is sought to subpart F of part 264 of this chapter, as provided by § 264.90 of this chapter, detailed plans and an engineering report describing how the requirements of § 264.90(b)(2) of this chapter will be met.

(c) Detailed plans and an engineering report describing how the drip pad is or will be designed, constructed, operated and maintained to meet the requirements of § 264.573 of this chapter, including the as-built drawings and spec-

ifications. This submission must address the following items as specified in § 264.571 of this chapter:

- (1) The design characteristics of the drip pad;
- (2) The liner system;
- (3) The leakage detection system, including the leak detection system and how it is designed to detect the failure of the drip pad or the presence of any releases of hazardous waste or accumulated liquid at the earliest practicable time;
- (4) Practices designed to maintain drip pads;
- (5) The associated collection system;
- (6) Control of run-on to the drip pad;
- (7) Control of run-off from the drip pad;
- (8) The interval at which drippage and other materials will be removed from the associated collection system and a statement demonstrating that the interval will be sufficient to prevent overflow onto the drip pad;
- (9) Procedures for cleaning the drip pad at least once every seven days to ensure the removal of any accumulated residues of waste or other materials, including but not limited to rinsing, washing with detergents or other appropriate solvents, or steam cleaning and provisions for documenting the date, time, and cleaning procedure used each time the pad is cleaned.
- (10) Operating practices and procedures that will be followed to ensure that tracking of hazardous waste or waste constituents off the drip pad due to activities by personnel or equipment is minimized;
- (11) Procedures for ensuring that, after removal from the treatment vessel, treated wood from pressure and non-pressure processes is held on the drip pad until drippage has ceased, including recordkeeping practices;
- (12) Provisions for ensuring that collection and holding units associated with the run-on and run-off control systems are emptied or otherwise managed as soon as possible after storms to maintain design capacity of the system;
- (13) If treatment is carried out on the drip pad, details of the process equipment used, and the nature and quality of the residuals.

(14) A description of how each drip pad, including appurtenances for control of run-on and run-off, will be inspected in order to meet the requirements of § 264.573 of this chapter. This information should be included in the inspection plan submitted under § 270.14(b)(5) of this part.

(15) A certification signed by an independent qualified, registered professional engineer, stating that the drip pad design meets the requirements of paragraphs (a) through (f) of § 264.573 of this chapter.

(16) A description of how hazardous waste residues and contaminated materials will be removed from the drip pad at closure, as required under § 264.575(a) of this chapter. For any waste not to be removed from the drip pad upon closure, the owner or operator must submit detailed plans and an engineering report describing how § 264.310 (a) and (b) of this chapter will be complied with. This information should be included in the closure plan and, where applicable, the post-closure plan submitted under § 270.14(b)(13).

(59 FR 50489, Dec. 6, 1990. Redesignated and amended at 56 FR 30196, July 1, 1991)

\$270.27 Specific Part B information requirements for air emission controls for tanks, surface impoundments, and containments.

(a) Except as otherwise provided in § 264.1 of this chapter, owners and operators of tanks, surface impoundments, or containments that use air emission controls in accordance with the requirements of 40 CFR part 264, subpart CC shall provide the following additional information:

- (1) Documentation for each cover installed on a tank subject to § 264.1084(b)(2) or § 264.1084(b)(3) of this chapter that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the applicable design specifications as listed in § 265.1091(c) of this chapter.
- (2) Identification of each containment area subject to the requirements of 40 CFR part 264, subpart CC and certification by the owner or operator that

application either in its entirety or as to the active life of a hazardous waste management facility or unit only.

(54 FR 9607, Mar. 7, 1989)

Subpart C—Permit Conditions

\$270.30 Conditions applicable to all permits.

The following conditions apply to all RCRA permits, and shall be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to these regulations (or the corresponding approved State regulations) must be given in the permit.

(b) *Duty to comply.* The permittee must comply with all conditions of this permit, except that the permittee need not comply with the conditions of this permit to the extent and for the duration such noncompliance is authorized in an emergency permit. (See § 270.61). Any permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the appropriate Act and is grounds for enforcement action; for permit termination, revocation and relinishment, or modification; or for denial of a permit renewal application.

(b) *Duty to reapply.* If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit.

(c) *Need to halt or reduce activity not a defense.* It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

(d) In the event of noncompliance with the permit, the permittee shall take all reasonable steps to minimize releases to the environment, and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment.

(e) *Proper operation and maintenance.* The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to

the requirements of this subpart are met.

(3) Documentation for each enclosure used to control air emissions from containments in accordance with the requirements of § 264.1086(b)(2)(i) of this chapter that includes information prepared by the owner or operator or provided by the manufacturer or vendor describing the enclosure design, and certification by the owner or operator that the enclosure meets the specifications listed in § 265.1087(b)(2)(i) of this chapter.

(4) Documentation for each floating membrane cover installed on a surface impoundment in accordance with the requirements of § 264.1085(c) of this chapter that includes information prepared by the owner or operator or provided by the cover manufacturer or vendor describing the cover design, and certification by the owner or operator that the cover meets the specifications listed in § 265.1086(e) of this chapter.

(5) Documentation for each closed-system and control device installed in accordance with the requirements of § 264.1087 of this chapter that includes design and performance information as specified in § 270.24 (c) and (d).

(6) An emission monitoring plan for both Method 21 and control device monitoring methods. This plan shall include the following information: monitoring points(s), monitoring frequency, procedures for documenting exceedances, and procedures for mitigating noncompliances.

(7) When an owner or operator of a facility subject to 40 CFR part 265, subpart CC cannot comply with 40 CFR part 264, subpart CC by the date of permit issuance, the schedule of implementation required under § 265.1082 of this chapter.

(59 FR 62952, Dec. 6, 1994)

EFFECTIVE DATE: NOTE: At 59 FR 62952, Dec. 6, 1994, § 270.27 was added. At 60 FR 26828, May 19, 1995, the effective date was delayed to December 6, 1995.

\$270.28 [Reserved]

\$270.29 Permit denial.

The Director may, pursuant to the procedures in part 124, deny the permit

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Subpart F—Special Forms of Permits

§ 270.60 Permits by rule.

Notwithstanding any other provision of this part or part 124, the following shall be deemed to have a RCRA permit if the conditions listed are met:

(a) *Ocean disposal barges or vessels.* The owner or operator of a barge or other vessel which accepts hazardous waste for ocean disposal, if the owner or operator:

- (1) Has a permit for ocean dumping issued under 40 CFR part 220 (Ocean Dumping, authorized by the Marine Protection, Research, and Sanctuaries Act, as amended, 33 U.S.C. 1420 *et seq.*);
- (2) Complies with the conditions of that permit; and
- (3) Complies with the following hazardous waste regulations:

(i) 40 CFR 264.11, Identification number;

(ii) 40 CFR 264.71, Use of manifest system;

(iii) 40 CFR 264.72, Manifest discrepancies;

(iv) 40 CFR 264.73(a) and (b)(1), Operating record;

(v) 40 CFR 264.75, Biennial report; and

(vi) 40 CFR 264.76, Unmanifested waste report.

(b) *Injection wells.* The owner or operator of an injection well disposing of hazardous waste, if the owner or operator:

- (1) Has a permit for underground injection issued under part 144 or 145; and
- (2) Complies with the conditions of that permit and the requirements of § 144.14 (requirements for wells managing hazardous waste).

(3) For UIC permits issued after November 8, 1984:

- (i) Complies with 40 CFR 264.101; and
- (ii) Where the UIC well is the only unit at a facility which requires a RCRA permit, complies with 40 CFR 270.14(d).

(c) *Publicly owned treatment works.* The owner or operator of a POTW which accepts for treatment hazardous waste, if the owner or operator:

- (1) Has an NPDES permit;
- (2) Complies with the conditions of that permit; and
- (3) Complies with the following regulations:

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(i) 40 CFR 264.11, Identification number;

(ii) 40 CFR 264.71, Use of manifest system;

(iii) 40 CFR 264.72, Manifest discrepancies;

(iv) 40 CFR 264.73(a) and (b)(1), Operating record;

(v) 40 CFR 264.75, Biennial report;

(vi) 40 CFR 264.76, Unmanifested waste report; and

(vii) For NPDES permits issued after November 8, 1984, 40 CFR 264.101.

(4) If the waste meets all Federal, State, and local pretreatment requirements which would be applicable to the waste if it were being discharged into the POTW through a sewer, pipe, or similar conveyance.

[45 FR 14228, Apr. 1, 1983, as amended at 50 FR 28752, July 15, 1985; 53 FR 45789, Dec. 1, 1987]

§ 270.61 Emergency permits.

(a) Notwithstanding any other provision of this part or part 124, in the event the Director finds an imminent and substantial endangerment to human health or the environment the Director may issue a temporary emergency permit: (1) To a non-permitted facility to allow treatment, storage, or disposal of hazardous waste or (2) to a permitted facility to allow treatment, storage, or disposal of a hazardous waste not covered by an effective permit.

(b) This emergency permit:

- (1) May be oral or written. If oral, it shall be followed in five days by a written emergency permit;
- (2) Shall not exceed 90 days in duration;

(3) Shall clearly specify the hazardous wastes to be received, and the manner and location of their treatment, storage, or disposal;

(4) May be terminated by the Director at any time without process if he or she determines that termination is appropriate to protect human health and the environment;

(5) Shall be accompanied by a public notice published under § 124.11(b) including:

- (i) Name and address of the office granting the emergency authorization;
- (ii) Name and location of the permitted HWM facility;

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(iii) A brief description of the wastes involved;

(iv) A brief description of the action authorized and reasons for authorizing it; and

(v) Duration of the emergency permit; and

(6) Shall incorporate, to the extent possible and not inconsistent with the emergency situation, all applicable requirements of this part and 40 CFR parts 264 and 268.

[49 FR 14228, Apr. 1, 1983, as amended at 48 FR 30114, June 30, 1983]

§ 270.62 Hazardous waste incinerator permits.

(a) For the purposes of determining operational readiness following completion of physical construction, the Director must establish permit conditions, including but not limited to allowable waste feeds and operating conditions, in the permit to a new hazardous waste incinerator. These permit conditions will be effective for the minimum time required to bring the incinerator to a point of operational readiness to conduct a trial burn, not to exceed 720 hours operating time for treatment of hazardous waste. The Director may extend the duration of this operational period once, for up to 720 additional hours, at the request of the applicant when good cause is shown. The permit may be modified to reflect the extension according to § 270.42 of this chapter.

(1) Applicants must submit a statement, with part B of the permit application, which suggests the conditions necessary to operate in compliance with the performance standards of § 264.343 of this chapter during this period. This statement should include, at a minimum, restrictions on waste constituents, waste feed rates and the operating parameters identified in § 264.345 of this chapter.

(2) The Director will review this statement and any other relevant information submitted with part B of the permit application and specify requirements for this period sufficient to meet the performance standards of § 264.343 of this chapter based on his engineering judgment.

(b) For the purposes of determining feasibility of compliance with the per-

formance standards of § 264.343 of this chapter and of determining adequate operating conditions under § 264.345 of this chapter, the Director must establish conditions in the permit for a new hazardous waste incinerator to be effective during the trial burn.

(1) Applicants must propose a trial burn plan, prepared under paragraph (b)(2) of this section with a part B of the permit application.

(2) The trial burn plan must include the following information:

(i) An analysis of each waste or mixture of wastes to be burned which includes:

(A) Heat value of the waste in the form and composition in which it will be burned.

(B) Viscosity (if applicable), or description of the physical form of the waste.

(C) An identification of any hazardous organic constituents listed in part 261, appendix VIII of this chapter, which are present in the waste to be burned, except that the applicant need not analyze for constituents listed in part 261, appendix VIII, of this chapter which would reasonably not be expected to be found in the waste. The constituents excluded from analysis must be identified, and the basis for the exclusion stated. The waste analysis must rely on analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter and § 270.6, or other equivalent.

(D) An approximate quantification of the hazardous constituents identified in the waste, within the precision produced by the analytical methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter and § 270.6, or their equivalent.

(i) A detailed engineering description of the incinerator for which the permit is sought including:

- (A) Manufacturer's name and model number of incinerator (if available).
- (B) Type of incinerator.

(C) Linear dimensions of the incinerator unit including the cross sectional area of combustion chamber.

(D) Description of the auxiliary fuel system (type/feeder).

(E) Capacity of prime mover.

(F) Description of automatic waste feed cut-off system(s).

(G) Stack gas monitoring and pollution control equipment.

(H) Nozzle and burner design.

(I) Construction materials.

(J) Location and description of temperature, pressure, and flow indicating and control devices.

(iii) A detailed description of sampling and monitoring procedures, including sampling and monitoring locations in the system, the equipment to be used, sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(iv) A detailed test schedule for each waste for which the trial burn is planned including date(s), duration, quantity of waste to be burned, and other factors relevant to the Director's decision under paragraph (b)(5) of this section.

(v) A detailed test protocol, including, for each waste identified, the ranges of temperature, waste feed rate, combustion gas velocity, use of auxiliary fuel, and any other relevant parameters that will be varied to affect the destruction and removal efficiency of the incinerator.

(vi) A description of, and planned operating conditions for, any emission control equipment which will be used.

(vii) Procedures for rapidly stopping waste feed, shutting down the incinerator, and controlling emissions in the event of an equipment malfunction.

(viii) Such other information as the Director reasonably finds necessary to determine whether to approve the trial burn plan in light of the purposes of this paragraph and the criteria in paragraph (b)(6) of this section.

(6) The Director, in reviewing the trial burn plan, shall evaluate the sufficiency of the information provided and may require the applicant to supplement this information, if necessary, to achieve the purposes of this paragraph.

(g) Based on the waste analysis data in the trial burn plan, the Director will

specify as trial Principal Organic Hazardous Constituents (POHCs), those constituents for which destruction and removal efficiencies must be calculated during the trial burn. These trial POHCs will be specified by the Director based on his estimate of the difficulty of incineration of the constituents identified in the waste analysis, their concentration or mass in the waste feed, and, for wastes listed in part 261, subpart D, of this chapter, the hazardous waste organic constituent or constituents identified in appendix VII of that part as the basis for listing.

(8) The Director shall approve a trial burn plan if he finds that:

(i) The trial burn is likely to determine whether the incinerator performance standard required by § 264.343 of this chapter can be met;

(ii) The trial burn itself will not present an imminent hazard to human health or the environment;

(iii) The trial burn will help the Director to determine operating requirements to be specified under § 264.345 of this chapter; and

(iv) The information sought in paragraphs (b)(5) (i) and (ii) of this section cannot reasonably be developed through other means.

(6) During each approved trial burn (or as soon after the burn as is practicable), the applicant must make the following determinations:

(i) A quantitative analysis of the trial POHCs in the waste feed to the incinerator.

(ii) A quantitative analysis of the exhaust gas for the concentration and mass emissions of the trial POHCs, oxygen (O_2) and hydrogen chloride (HCl).

(iii) A quantitative analysis of the scrubber water (if any), ash residues, and other residues, for the purpose of estimating the fate of the trial POHCs.

(iv) A computation of destruction and removal efficiency (DRE), in accordance with the DRE formula specified in § 264.343(a) of this chapter.

(v) If the HCl emission rate exceeds 1.8 kilograms of HCl per hour (4 pounds per hour), a computation of HCl removal efficiency in accordance with § 264.343(b) of this chapter.

(vi) A computation of particulate emissions, in accordance with § 264.343(c) of this chapter.

(vii) An identification of sources of fugitive emissions and their means of control.

(viii) A measurement of average, maximum, and minimum temperatures and combustion gas velocity.

(ix) A continuous measurement of carbon monoxide (CO) in the exhaust gas.

(x) Such other information as the Director may specify as necessary to ensure that the trial burn will determine compliance with the performance standards in § 264.343 of this chapter and to establish the operating conditions required by § 264.345 of this chapter as necessary to meet that performance standard.

(7) The applicant must submit to the Director a certification that the trial burn has been carried out in accordance with the approved trial burn plan, and must submit the results of all the determinations required in paragraph (b)(6) of this section. This submission shall be made within 90 days of completion of the trial burn, or later if approved by the Director.

(8) All data collected during any trial burn must be submitted to the Director following the completion of the trial burn.

(9) All submissions required by this paragraph must be certified on behalf of the applicant by the signature of a person authorized to sign a permit application or a report under § 270.11.

(10) Based on the results of the trial burn, the Director shall set the operating requirements in the final permit according to § 264.345 of this chapter. The permit modification shall proceed according to § 270.42.

(3) For the purposes of allowing operation of a new hazardous waste incinerator following completion of the trial burn and prior to final modification of the permit conditions to reflect the trial burn results, the Director may establish permit conditions, including but not limited to allowable waste feeds and operating conditions sufficient to meet the requirements of § 264.345 of this chapter, in the permit. These permit conditions will be effective for the minimum time required to complete sample analysis, data computation and submission of the trial

burn results by the applicant, and modification of the facility permit by the Director.

(1) Applicants must submit a statement, with part B of the permit application, which identifies the conditions necessary to operate in compliance with the performance standards of § 264.343 of this chapter, during this period. This statement should include, at a minimum, restrictions on waste constituents, waste feed rates, and the operating parameters in § 264.345 of this chapter.

(2) The Director will review this statement and any other relevant information submitted with part B of the permit application and specify those requirements for this period most likely to meet the performance standards of § 264.343 of this chapter based on his engineering judgment.

(4) For the purpose of determining feasibility of compliance with the performance standards of § 264.343 of this chapter and of determining adequate operating conditions under § 264.345 of this chapter, the applicant for a permit for an existing hazardous waste incinerator must prepare and submit a trial burn plan and perform a trial burn in accordance with § 270.19(b) and paragraphs (b)(2) through (b)(9) of this section or, instead, submit other information as specified in § 270.19(c). Applicants submitting information under § 270.19(a) are exempt from compliance with § 264.343 and 264.345 and, therefore, are exempt from the requirements to conduct a trial burn. Applicants who submit trial burn plans and receive approval before submission of a permit application must complete the trial burn and submit the results, specified in paragraph (b)(6), with part B of the permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Director to establish a later date for submission of the part B application or submission of the part B application or the trial burn results. Trial burn results must be submitted prior to issuance of the permit. When the applicant submits a trial burn plan with part B of the permit application, the Director will specify a time period prior to permit issuance in which the trial burn

must be conducted and the results submitted.

(48 FR 14228, Apr. 1, 1983, as amended at 63 FR 37839, Sept. 29, 1998; 54 FR 4268, Jan. 30, 1989; 59 FR 46361, Aug. 31, 1993)

§ 270.63 Permits for land treatment demonstrations using field test or laboratory analyses.

(a) For the purpose of allowing an owner or operator to meet the treatment demonstration requirements of § 264.272 of this chapter, the Director may issue a treatment demonstration permit. The permit must contain only those requirements necessary to meet the standards in § 264.272(c). The permit may be issued either as a treatment or disposal permit covering only the field test or laboratory analyses, or as a two-phase facility permit covering the field tests, or laboratory analyses, and design, construction operation and maintenance of the land treatment unit.

(1) The Director may issue a two-phase facility permit if he finds that, based on information submitted in part B of the application, substantial, although incomplete or inconclusive, information already exists upon which to base the issuance of a facility permit.

(2) If the Director finds that not enough information exists upon which he can establish permit conditions to attempt to provide for compliance with all of the requirements of subpart M, he must issue a treatment demonstration permit covering only the field test or laboratory analyses.

(b) If the Director finds that a phased permit may be issued, he will establish, as requirements in the first phase of the facility permit, conditions for conducting the field tests or laboratory analyses. These permit conditions will include design and operating parameters (including the duration of the tests or analyses and, in the case of field tests, the horizontal and vertical dimensions of the treatment zone), monitoring procedures, post-demonstration clean-up activities, and any other conditions which the Director finds may be necessary under § 264.272(c). The Director will include conditions in the second phase of the facility permit to attempt to meet all subpart M requirements pertaining to

unit design, construction, operation, and maintenance. The Director will establish these conditions in the second phase of the permit based upon the substantial but incomplete or inconclusive information contained in the part B application.

(1) The first phase of the permit will be effective as provided in § 270.15(b) of this chapter.

(2) The second phase of the permit will be effective as provided in paragraph (d) of this section.

(c) When the owner or operator who has been issued a two-phase permit has completed the treatment demonstration, he must submit to the Director a certification, signed by a person authorized to sign a permit application or report under § 270.11, that the field tests or laboratory analyses have been carried out in accordance with the conditions specified in phase one of the permit for conducting such tests or analyses. The owner or operator must also submit all data collected during the field tests or laboratory analyses within 90 days of completion of those tests or analyses unless the Director approves a later date.

(d) If the Director determines that the results of the field tests or laboratory analyses meet the requirements of § 264.272 of this chapter, he will modify the second phase of the permit to incorporate any requirements necessary for operation of the facility in compliance with part 264, subpart M, of this chapter, based upon the results of the field tests or laboratory analyses.

(1) This permit modification may proceed under § 270.42, or otherwise will proceed as a modification under § 270.41(a)(2). If such modifications are necessary, the second phase of the permit will become effective only after those modifications have been made.

(2) If no modifications of the second phase of the permit are necessary, the Director will give notice of his final decision to the permit applicant and to each person who submitted written comments on the phased permit or who requested notice of the final decision on the second phase of the permit. The second phase of the permit then will

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become effective as specified in § 270.15(b).

(48 FR 14228, Apr. 1, 1983, as amended at 53 FR 37839, Sept. 29, 1988)

§ 270.64 Interim permits for UIC wells.

The Director may issue a permit under this part to any Class I UIC well (see § 144.6) injecting hazardous wastes within a State in which no UIC program has been approved or promulgated. Any such permit shall apply and insure compliance with all applicable requirements of 40 CFR part 264, subpart R (RCRA standards for wells), and shall be for a term not to exceed two years. No such permit shall be issued after approval or promulgation of a UIC program in the State. Any permit under this section shall contain a condition providing that it will terminate upon final action by the Director under a UIC program to issue or deny a UIC permit for the facility.

(48 FR 14228, Apr. 1, 1983; 48 FR 30114, June 30, 1983)

§ 270.65 Research, development, and demonstration permits.

(a) The Administrator may issue a research, development, and demonstration permit for any hazardous waste treatment facility which proposes to utilize an innovative and experimental hazardous waste treatment technology or process for which permit standards for such experimental activity have not been promulgated under part 264 or 266. Any such permit shall include such terms and conditions as will assure protection of human health and the environment. Such permits:

(1) Shall provide for the construction of such facilities as necessary, and for operation of the facility for not longer than one year unless renewed as provided in paragraph (d) of this section, and

(2) Shall provide for the receipt and treatment by the facility of only those types and quantities of hazardous waste which the Administrator deems necessary for purposes of determining the efficacy and performance capabilities of the technology or process and the effects of such technology or process on human health and the environment, and

(3) Shall include such requirements as the Administrator deems necessary to protect human health and the environment (including, but not limited to, requirements regarding monitoring, operation, financial responsibility, closure, and remedial action), and such requirements as the Administrator deems necessary regarding testing and providing of information to the Administrator with respect to the operation of the facility.

(b) For the purpose of expediting review and issuance of permits under this section, the Administrator may, consistent with the protection of human health and the environment, modify or waive permit application and permit issuance requirements in parts 134 and 270 except that there may be no modification or waiver of regulations regarding financial responsibility (including insurance) or of procedures regarding public participation.

(c) The Administrator may order an immediate termination of all operations at the facility at any time he determines that termination is necessary to protect human health and the environment.

(d) Any permit issued under this section may be renewed not more than three times. Each such renewal shall be for a period of not more than 1 year.

(50 FR 28752, July 15, 1985)

§ 270.66 Permits for boilers and industrial furnaces burning hazardous waste.

General. Owners and operators of new boilers and industrial furnaces (those not operating under the interim status standards of § 266.103 of this chapter) are subject to paragraphs (b) through (f) of this section. Boilers and industrial furnaces operating under the interim status standards of § 266.103 of this chapter are subject to paragraph (g) of this section.

(b) **Permit operating periods for new boilers and industrial furnaces.** A permit for a new boiler or industrial furnace shall specify appropriate conditions for the following operating periods:

(1) **Pretrial burn period.** For the period beginning with initial introduction of hazardous waste and ending with initiation of the trial burn, and only for the minimum time required to bring the

boiler or industrial furnace to a point of operational readiness to conduct a trial burn, not to exceed 720 hours operating time when burning hazardous waste, the Director must establish in the Pretrial Burn Period of the permit conditions, including but not limited to, allowable hazardous waste feed rates and operating conditions. The Director may extend the duration of this operational period once, for up to 720 additional hours, at the request of the applicant when good cause is shown. The permit may be modified to reflect the extension according to § 270.42.

(1) Applicants must submit a statement, with part B of the permit application, that suggests the conditions necessary to operate in compliance with the standards of § 266.104 through 266.107 of this chapter during this period. This statement should include, at a minimum, restrictions on the applicable operating requirements identified in § 266.102(e) of this chapter.

(2) The Director will review this statement and any other relevant information submitted with part B of the permit application and specify requirements for this period sufficient to meet the performance standards of § 266.104 through 266.107 of this chapter based on his/her engineering judgment.

(3) *Post-trial burn period.* (1) For the period immediately following completion of the trial burn, and only for the minimum period sufficient to allow sample analysis, data computation, and submission of the trial burn results by the applicant, and review of the trial burn results and modification of the facility permit by the Director to reflect the trial burn results, the Director will establish the operating requirements most likely to ensure compliance with the performance standards

present in the feed stream, except that the applicant need not analyze for constituents listed in appendix VIII that would reasonably not be expected to be found in the hazardous waste. The constituents excluded from analysis must be identified and the basis for this exclusion explained. The waste analysis must be conducted in accordance with analytical techniques specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter and § 270.6, or their equivalent.

(2) An approximate quantification of the hazardous constituents identified in the hazardous waste, within the precision produced by the analytical methods specified in "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA Publication SW-846, as incorporated by reference in § 260.11 of this chapter and § 270.6, or their equivalent.

(3) A description of blending procedures, if applicable, prior to firing the hazardous waste, including a detailed analysis of the hazardous waste prior to blending, an analysis of the material with which the hazardous waste is blended, and blending ratios.

(4) A detailed engineering description of the boiler or industrial furnace, including:

(i) Manufacturer's name and model number of the boiler or industrial furnace;

(ii) Type of boiler or industrial furnace;

(iii) Maximum design capacity in appropriate units;

(iv) Description of the feed system for the hazardous waste, and, as appropriate, other fuels and industrial furnace feedstocks;

(v) Capacity of hazardous waste feed system;

(vi) Description of automatic hazardous waste feed cutoff system(s);

(vii) Description of any air pollution control system; and

(viii) Description of stack gas monitoring and any pollution control monitoring systems.

(4) A detailed description of sampling and monitoring procedures including sampling and monitoring locations in the system, the equipment to be used,

sampling and monitoring frequency, and planned analytical procedures for sample analysis.

(5) A detailed test schedule for each hazardous waste for which the trial burn is planned, including date(s), duration, quantity of hazardous waste to be burned, and other factors relevant to the Director's decision under paragraph (b)(2) of this section.

(6) A detailed test protocol, including, for each hazardous waste identified, the ranges of hazardous waste feed rate, and, as appropriate, the feed rates of other fuels and industrial furnace feedstocks, and any other relevant parameters that may affect the ability of the boiler or industrial furnace to meet the performance standards in § 266.104 through 266.107 of this chapter.

(7) A description of, and planned operating conditions for, any emission control equipment that will be used.

(8) Procedures for rapidly stopping the hazardous waste feed and controlling emissions in the event of an equipment malfunction.

(9) Such other information as the Director reasonably finds necessary to determine whether to approve the trial burn plan in light of the purposes of this paragraph and the criteria in paragraph (b)(2) of this section.

(c) *Trial burn procedures.* (1) A trial burn must be conducted to demonstrate conformance with the standards of § 266.104 through 266.107 of this chapter under an approved trial burn plan.

(2) The Director shall approve a trial burn plan if he/she finds that:

(i) The trial burn is likely to determine whether the boiler or industrial furnace can meet the performance standards of § 266.104 through 266.107 of this chapter;

(ii) The trial burn itself will not present an imminent hazard to human health and the environment;

(iii) The trial burn will help the Director to determine operating requirements to be specified under § 266.102(e) of this chapter; and

(iv) The information sought in the trial burn cannot reasonably be developed through other means.

(3) The applicant must submit to the Director a certification that the trial burn has been carried out in accordance

ance with the approved trial burn plan, and must submit the results of all the determinations required in paragraph (c) of this section. This submission shall be made within 90 days of completion of the trial burn, or later if approved by the Director.

(4) All data collected during any trial burn must be submitted to the Director following completion of the trial burn.

(5) All submissions required by this paragraph must be certified on behalf of the applicant by the signature of a person authorized to sign a permit application or a report under § 270.11.

Special procedures for DRE trial burns. When a DRE trial burn is required under § 268.104(a) of this chapter, the Director will specify (based on the hazardous waste analysis data and other information in the trial burn plan) as trial Principal Organic Hazardous Constituents (POHCs) those compounds for which destruction and removal efficiencies must be calculated during the trial burn. These trial POHCs will be specified by the Director based on information including his/her estimate of the difficulty of destroying the constituents identified in the hazardous waste analysis, their concentrations or mass in the hazardous waste feed, and, for hazardous waste containing or derived from wastes listed in part 261, subpart D of this chapter, the hazardous waste organic constituent(s) identified in Appendix VII of that part as the basis for listing.

Determinations based on trial burn. During each approved trial burn (or as soon after the burn as is practicable), the applicant must make the following determinations:

(1) A quantitative analysis of the levels of antimony, arsenic, barium, beryllium, cadmium, chromium, lead, mercury, thallium, silver, and chlorine/chloride, in the feed streams (hazardous waste, other fuels, and industrial furnace feedstocks);

(2) When a DRE trial burn is required under § 268.104(a) of this chapter:

(i) A quantitative analysis of the trial POHCs in the hazardous waste feed;

(ii) A quantitative analysis of the stack gas for the concentration and mass emissions of the trial POHCs; and

(iii) A computation of destruction and removal efficiency (DRE), in accordance with the DRE formula specified in § 268.104(a) of this chapter;

(3) When a trial burn for chlorinated dioxins and furans is required under § 268.104(e) of this chapter, a quantitative analysis of the stack gas for the concentration and mass emission rate of the 2,3,7,8-chlorinated tetraoxa congeners of chlorinated dibenzodioxins and furans, and a computation showing conformance with the emission standard;

(4) When a trial burn for particulate matter, metals, or HCl/Cl₂ is required under §§ 268.106, 268.106 (c) or (d), or 268.107 (b)(2) or (c) of this chapter, a quantitative analysis of the stack gas for the concentrations and mass emissions of particulate matter, metals, or hydrogen chloride (HCl) and chlorine (Cl₂), and computations showing conformance with the applicable emission performance standards;

(5) When a trial burn for DRE, metals, or HCl/Cl₂ is required under §§ 268.104(a), 268.106 (c) or (d), or 268.107 (b)(2) or (c) of this chapter, a quantitative analysis of the scrubber water (if any), ash residues, other residues, and products for the purpose of estimating the fate of the trial POHCs, metals, and chlorine/chloride;

(6) An identification of sources of fugitive emissions and their means of control;

(7) A continuous measurement of carbon monoxide (CO), oxygen, and where required, hydrocarbons (HC). In the stack gas; and

(8) Such other information as the Director may specify as necessary to ensure that the trial burn will determine compliance with the performance standards in §§ 266.104 through 266.107 of this chapter and to establish the operating conditions required by § 266.102(e) of this chapter as necessary to meet those performance standards.

Interim status boilers and industrial furnaces. For the purpose of determining feasibility of compliance with the performance standards of §§ 268.104 through 268.107 of this chapter and of determining adequate operating conditions under § 268.103 of this chapter, applicants owning or operating existing boilers or industrial furnaces operated

under the interim status standards of § 268.103 must either prepare and submit a trial burn plan and perform a trial burn in accordance with the requirements of this section or submit other information as specified in § 270.22(a)(6). Applicants who submit a trial burn plan and receive approval before submission of the part B permit application must complete the trial burn and submit the results specified in paragraph (f) of this section with the part B permit application. If completion of this process conflicts with the date set for submission of the part B application, the applicant must contact the Director to establish a later date for submission of the part B application or the trial burn results. If the applicant submits a trial burn plan with part B of the permit application, the trial burn must be conducted and the results submitted within a time period prior to permit issuance to be specified by the Director.

[56 FR 7239, Feb. 21, 1991; 56 FR 32892, July 17, 1991, as amended at 56 FR 46051, Aug. 31, 1993]

Subpart G—Interim Status

§ 270.70 Qualifying for interim status.

(a) Any person who owns or operates an "existing HWM facility" or a facility in existence on the effective date of statutory or regulatory amendments under the Act that render the facility subject to the requirement to have an RCRA permit shall have interim status and shall be treated as having been issued a permit to the extent he or she has:

(1) Complied with the requirements of section 3010(a) of RCRA pertaining to notification of hazardous waste activity.

[Comment: Some existing facilities may not be required to file a notification under section 3010(a) of RCRA. These facilities may qualify for interim status by meeting paragraph (a)(2) of this section.]

(2) Complied with the requirements of § 270.10 governing submission of part A applications;

(b) Failure to qualify for interim status. If EPA has reason to believe upon examination of a part A application that it fails to meet the requirements of § 270.13, it shall notify the owner or

operator in writing of the apparent deficiency. Such notice shall specify the grounds for EPA's belief that the application is deficient. The owner or operator shall have 30 days from receipt to respond to such a notification and to explain or cure the alleged deficiency in his part A application. If, after such notification and opportunity for response, EPA determines that the application is deficient it may take appropriate enforcement action.

(c) Paragraph (a) of this section shall not apply to any facility which has been previously denied a RCRA permit or if authority to operate the facility under RCRA has been previously terminated.

[48 FR 14228, Apr. 1, 1983, as amended at 49 FR 17718, Apr. 24, 1984; 50 FR 28753, July 15, 1985]

§ 270.71 Operation during interim status.

(a) During the interim status period the facility shall not:

(1) Treat, store, or dispose of hazardous waste not specified in part A of the permit application;

(2) Employ processes not specified in part A of the permit application; or

(3) Exceed the design capacities specified in part A of the permit application.

(b) Interim status standards. During interim status, owners or operators shall comply with the interim status standards at 40 CFR part 265.

§ 270.72 Changes during interim status.

(a) Except as provided in paragraph

(b), the owner or operator of an interim status facility may make the following changes at the facility:

(1) Treatment, storage, or disposal of new hazardous wastes not previously identified in part A of the permit application (and, in the case of newly listed or identified wastes, addition of the units being used to treat, store, or dispose of the hazardous wastes on the effective date of the listing or identification) if the owner or operator submits a revised part A permit application prior to such treatment, storage, or disposal;

(2) Increases in the design capacity of processes used at the facility if the

ronment not subject to the requirements of part 280, subpart F of this chapter which has occurred after the effective date of the authorized used oil program for the State in which the release is located, a generator must perform the following cleanup steps:

- (1) Stop the release;
- (2) Contain the released used oil;
- (3) Clean up and manage properly the released used oil and other materials; and
- (4) If necessary to prevent future releases, repair or replace any leaking used oil storage containers or tanks prior to returning them to service.

(57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26426, May 3, 1993)

§ 279.33 On-site burning in space heaters.

Generators may burn used oil in used oil-fired space heaters provided that:

- (a) The heater burns only used oil that the owner or operator generates or used oil received from household do-it-yourself used oil generators;
- (b) The heater is designed to have a maximum capacity of not more than 0.6 million Btu per hour; and
- (c) The combustion gases from the heater are vented to the ambient air.

(57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26426, May 3, 1993)

§ 279.34 Off-site shipments.

Except as provided in paragraphs (a) through (c) of this section, generators must ensure that their used oil is transported only by transporters who have obtained EPA identification numbers.

(a) *Self-transportation of small amounts to approved collection centers.* Generators may transport, without an EPA identification number, used oil that is generated at the generator's site and used oil collected from household do-it-yourselfers to a used oil collection center provided that:

- (1) The generator transports the used oil in a vehicle owned by the generator or owned by an employee of the generator;
- (2) The generator transports no more than 55 gallons of used oil at any time; and
- (3) The generator transports the used oil to a used oil collection center that

is registered, licensed, permitted, or recognized by a state/county/municipal government to manage used oil.

(b) *Self-transportation of small amounts to aggregation points owned by the generator.* Generators may transport, without an EPA identification number, used oil that is generated at the generator's site to an aggregation point provided that:

- (1) The generator transports the used oil in a vehicle owned by the generator or owned by an employee of the generator;
- (2) The generator transports no more than 55 gallons of used oil at any time; and
- (3) The generator transports the used oil to an aggregation point that is owned and/or operated by the same generator.

(c) *Tolling arrangements.* Used oil generators may arrange for used oil to be transported by a transporter without an EPA identification number if the used oil is reclaimed under a contractual agreement pursuant to which reclaimed oil is returned by the processor/refiner to the generator for use as a lubricant, cutting oil, or coolant. The contract (known as a "tolling arrangement") must indicate:

- (1) The type of used oil and the frequency of shipments;
- (2) That the vehicle used to transport the used oil to the processing/re-refining facility and to deliver recycled used oil back to the generator is owned and operated by the used oil processor/refiner; and
- (3) That reclaimed oil will be returned to the generator.

Subpart D—Standards for Used Oil Collection Centers and Aggregation Points

§ 279.30 Do-it-yourselfer used oil collection centers.

(a) *Applicability.* This section applies to owners or operators of all do-it-yourselfer (DIY) used oil collection centers. A DIY used oil collection center is any site or facility that accepts aggregates and stores used oil collected only from household do-it-yourselfers.

(b) *DIY used oil collection center requirements.* Owners or operators of all DIY used oil collection centers must

comply with the generator standards in subpart C of this part.

§ 279.31 Used oil collection centers.

(a) *Applicability.* This section applies to owners or operators of used oil collection centers. A used oil collection center is any site or facility that accepts/aggregates and stores used oil collected from used oil generators regulated under subpart C of this part who bring used oil to the collection center in shipments of no more than 55 gallons under the provisions of § 279.24(a). Used oil collection centers may also accept used oil from household do-it-yourselfers.

(b) *Used oil collection center requirements.* Owners or operators of all used oil collection centers must:

- (1) Comply with the generator standards in subpart C of this part; and
- (2) Be registered/licensed/permitted/recognized by a state/county/municipal government to manage used oil.

§ 279.32 Used oil aggregation points owned by the generator.

(a) *Applicability.* This section applies to owners or operators of all used oil aggregation points. A used oil aggregation point is any site or facility that accepts, aggregates, and/or stores used oil collected only from other used oil generation sites owned or operated by the owner or operator of the aggregation point, from which used oil is transported to the aggregation point in shipments of no more than 55 gallons under the provisions of § 279.24(b). Used oil aggregation points may also accept used oil from household do-it-yourselfers.

(b) *Used oil aggregation point requirements.* Owners or operators of all used oil aggregation points must comply with the generator standards in subpart C of this part.

Subpart E—Standards for Used Oil Transporter and Transfer Facilities

§ 279.40 Applicability.

(a) *General.* Except as provided in paragraphs (a)(1) through (a)(4) of this section, this subpart applies to all used oil transporters. Used oil transporters are persons who transport used oil, persons who collect used oil from more

than one generator and transport the collected oil, and owners and operators of oil transfer facilities.

- (1) This subpart does not apply to on-site transportation.
- (2) This subpart does not apply to generators who transport shipments of used oil totalling 55 gallons or less from the generator to a used oil collection center as specified in § 279.24(a).
- (3) This subpart does not apply to generators who transport shipments of used oil totalling 55 gallons or less from the generator to a used oil aggregation point owned or operated by the same generator as specified in § 279.24(b).
- (4) This subpart does not apply to transportation of used oil from household do-it-yourselfers to a regulated aggregation point, processor/refiner, or burner subject to the requirements of this part. Except as provided in paragraphs (a)(1) through (a)(3) of this section, this subpart does, however, apply to transportation of collected household do-it-yourselfer used oil from regulated used oil generators, collection centers, aggregation points, or other facilities where household do-it-yourselfer used oil is collected.

(b) *Imports and exports.* Transporters who import used oil from abroad or export used oil outside of the United States are subject to the requirements of this subpart from the time the used oil enters and until the time it exits the United States.

(c) *Trucks used to transport hazardous waste.* Unless trucks previously used to transport hazardous waste are emptied as described in § 261.7 of this chapter prior to transporting used oil, the used oil is considered to have been mixed with the hazardous waste and must be managed as hazardous waste unless, under the provisions of § 279.10(b), the hazardous waste/used oil mixture is determined not to be hazardous waste.

(d) *Other applicable provisions.* Used oil transporters who conduct the following activities are also subject to other applicable provisions of this part as indicated in paragraphs (d)(1) through (5) of this section:

- (1) Transporters who generate used oil must also comply with subpart C of this part;

§ 279.56 Tracking.

(1) Whether sample analyses or knowledge of the halogen content of the used oil will be used to make this determination.

(2) If sample analyses are used to make this determination:

(i) The sampling method used to obtain representative samples to be analyzed. A representative sample may be obtained using either:

(A) One of the sampling methods in appendix I of part 261 of this chapter; or

(B) A method shown to be equivalent under §§ 260.20 and 260.21 of this chapter;

(ii) The frequency of sampling to be performed, and whether the analysis will be performed on-site or off-site; and

(iii) The methods used to analyze used oil for the parameters specified in § 279.53; and

(3) The type of information that will be used to determine the halogen content of the used oil.

(b) *On-specification used oil fuel* in § 279.72. At a minimum, the plan must specify the following if § 279.72 is applicable:

(1) Whether sample analyses or other information will be used to make this determination;

(2) If sample analyses are used to make this determination:

(i) The sampling method used to obtain representative samples to be analyzed. A representative sample may be obtained using either:

(A) One of the sampling methods in appendix I of part 261 of this chapter; or

(B) A method shown to be equivalent under §§ 260.20 and 260.21 of this chapter;

(ii) Whether used oil will be sampled and analyzed prior to or after any processing/re-refining;

(iii) The frequency of sampling to be performed, and whether the analysis will be performed on-site or off-site; and

(iv) The methods used to analyze used oil for the parameters specified in § 279.72; and

(3) The type of information that will be used to make the on-specification used oil fuel determination.

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§ 279.57 Operating record and reporting.

(a) *Operating record.* (1) The owner or operator must keep a written operating record at the facility.

(2) The following information must be recorded, as it becomes available, and maintained in the operating record until closure of the facility:

(i) Records and results of used oil analyses performed as described in the analysis plan required under § 279.55; and

(ii) Summary reports and details of all incidents that require implementation of the contingency plan as specified in § 279.52(b).

(b) *Reporting.* A used oil processor/refiner must report to the Regional Administrator, in the form of a letter, on a biennial basis (by March 1 of each even numbered year), the following information concerning used oil activities during the previous calendar year:

(1) The EPA identification number, name, and address of the processor/refiner;

(2) The calendar year covered by the report; and

(3) The quantities of used oil accepted for processing/re-refining and the manner in which the used oil is processed/re-refined, including the specific processes employed.

§ 279.58 Off-site shipments of used oil.

Used oil processors/refiners who initiate shipments of used oil off-site must ship the used oil using a used oil transporter who has obtained an EPA identification number.

§ 279.59 Management of residues.

Owners and operators who generate residues from the storage, processing, or re-refining of used oil must manage the residues as specified in § 279.10(e).

Subpart G—Standards for Used Oil Burners Who Burn Off-Specification Used Oil for Energy Recovery

§ 279.60 Applicability.

(a) *General.* The requirements of this subpart apply to used oil burners except as specified in paragraphs (a)(1) and (a)(2) of this section. A used oil

burner is a facility where used oil not meeting the specification requirements in § 279.11 is burned for energy recovery in devices identified in § 279.61(a). Facilities burning used oil for energy recovery under the following conditions are not subject to this Subpart:

(1) The used oil is burned by the generator in an on-site space heater under the provisions of § 279.23; or

(2) The used oil is burned by a processor/refiner for purposes of processing used oil, which is considered burning incidentally to used oil processing.

(b) *Other applicable provisions.* Used oil burners who conduct the following activities are also subject to the requirements of other applicable provisions of this part as indicated below.

(1) Burners who generate used oil must also comply with subpart C of this part;

(2) Burners who transport used oil must also comply with subpart E of this part;

(3) Except as provided in § 279.61(b), burners who process or re-refine used oil must also comply with subpart F of this part;

(4) Burners who direct shipments of off-specification used oil from their facility to a used oil burner or first claim that used oil that is to be burned for energy recovery meets the used oil fuel specifications set forth in § 279.11 must also comply with subpart H of this part; and

(5) Burners who dispose of used oil, including the use of used oil as a dust suppressant, must comply with subpart I of this part.

(c) *Specification fuel.* This subpart does not apply to persons burning used oil that meets the used oil fuel specification of § 279.11, provided that the burner complies with the requirements of subpart H of this part.

(57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26436, May 3, 1993)

§ 279.61 Restrictions on burning.

(a) Off-specification used oil fuel may be burned for energy recovery in only the following devices:

(1) Industrial furnaces identified in § 260.10 of this chapter;

(2) Boilers, as defined in § 260.10 of this chapter, that are identified as follows:

(1) Industrial boilers located on the site of a facility engaged in a manufacturing process where substances are transformed into new products, including the component parts of products, by mechanical or chemical processes;

(11) Utility boilers used to produce electric power, steam, heated or cooled air, or other gases or fluids for sale; or

(111) Used oil-fired space heaters provided that the burner meets the provisions of § 279.23; or

(3) Hazardous waste incinerators subject to regulation under subpart O of parts 264 or 265 of this chapter.

(b)(1) With the following exception, used oil burners may not process used oil unless they also comply with the requirements of subpart F of this part.

(2) Used oil burners may aggregate off-specification used oil with virgin oil or on-specification used oil for purposes of burning, but may not aggregate for purposes of producing on-specification used oil.

§ 279.63 Notification

(a) *Identification numbers.* Used oil burners which have not previously complied with the notification requirements of RCRA section 3010 must comply with these requirements and obtain an EPA identification number.

(b) *Mechanics of notification.* A used oil burner who has not received an EPA identification number may obtain one by notifying the Regional Administrator of their used oil activity by submitting either:

(1) A completed EPA Form 8700-12 (To obtain EPA Form 8700-12 call RCRA/Superfund Hotline at 1-800-424-8348 or 703-603-8810); or

(2) A letter requesting an EPA identification number. Call the RCRA/Superfund Hotline to determine where to send a letter requesting an EPA identification number. The letter should include the following information:

- (i) Burner company name;
- (ii) Owner of the burner company;
- (iii) Mailing address for the burner;
- (iv) Name and telephone number for the burner point of contact;
- (v) Type of used oil activity; and
- (vi) Location of the burner facility.

[§ 279.62, Sept. 10, 1992, as amended at 56 FR 33342, June 17, 1993]

§ 279.63 Rebuttable presumption for used oil.

(a) To ensure that used oil managed at a used oil burner facility is not hazardous waste under the rebuttable presumption of § 279.10(b)(1)(1), a used oil burner must determine whether the total halogen content of used oil managed at the facility is above or below 1,000 ppm.

(b) The used oil burner must determine if the used oil contains above or below 1,000 ppm total halogens by:

- (1) Testing the used oil;
- (2) Applying knowledge of the halogen content of the used oil in light of the materials or processes used; or
- (3) If the used oil has been received from a processor/refiner subject to regulation under subpart F of this part, using information provided by the processor/refiner.

(c) If the used oil contains greater than or equal to 1,000 ppm total halogens, it is presumed to be a hazardous waste/because it has been mixed with halogenated hazardous waste listed in subpart D of part 261 of this chapter. The owner or operator may rebut the presumption by demonstrating that the used oil does not contain hazardous waste (for example, by using an analytical method from SW-846, Edition III, to show that the used oil does not contain significant concentrations of halogenated hazardous constituents listed in appendix VIII of part 261 of this chapter). EPA Publication SW-846, Third Edition, is available from the Government Printing Office, Superintendent of Documents, PO Box 371954, Pittsburgh, PA 15250-7954. 202-512-1800 (document number 955-001-00000-1).

(1) The rebuttable presumption does not apply to metalworking oils/fluids containing chlorinated paraffins. If they are processed, through a tolling arrangement as described in § 279.24(c), to reclaim metalworking oils/fluids. The presumption does apply to metalworking oils/fluids if such oils/fluids are recycled in any other manner, or disposed.

(2) The rebuttable presumption does not apply to used oils contaminated with chlorofluorocarbons (CFCs) removed from refrigeration units where the CFCs are destined for reclamation. The rebuttable presumption does apply

to used oils contaminated with CFCs that have been mixed with used oil from sources other than refrigeration units.

(d) *Record retention.* Records of analyses conducted or information used to comply with paragraphs (a), (b), and (c) of this section must be maintained by the burner for at least 3 years.

[57 FR 41612, Sept. 10, 1992, as amended at 59 FR 10560, Mar. 4, 1994]

§ 279.64 Used oil storage.

Used oil burners are subject to all applicable Spill Prevention, Control and Countermeasures (40 CFR part 112) in addition to the requirements of this subpart. Used oil burners are also subject to the Underground Storage Tank (40 CFR part 280) standards for used oil stored in underground tanks whether or not the used oil exhibits any characteristics of hazardous waste, in addition to the requirements of this subpart.

(a) *Storage units.* Used oil burners may not store used oil in units other than tanks, containers, or units subject to regulation under parts 264 or 265 of this chapter.

(b) *Condition of units.* Containers and aboveground tanks used to store oil at burner facilities must be:

- (1) In good condition (no severe rusting, apparent structural defects or deterioration); and
- (2) Not leaking (no visible leaks).

(c) *Secondary containment for containers.* Containers used to store used oil at burner facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

- (i) Dikes, berms or retaining walls; and
- (ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

(d) *Secondary containment for existing aboveground tanks.* Existing aboveground tanks used to store used oil at

burner facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

- (i) Dikes, berms or retaining walls; and
- (ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall except areas where existing portions of the tank meet the ground; or

(11) An equivalent secondary containment system.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

(e) *Secondary containment for existing aboveground tanks.* New aboveground tanks used to store used oil at burner facilities must be equipped with a secondary containment system.

(1) The secondary containment system must consist of, at a minimum:

- (i) Dikes, berms or retaining walls; and
- (ii) A floor. The floor must cover the entire area within the dike, berm, or retaining wall; or

(11) An equivalent secondary containment system.

(2) The entire containment system, including walls and floor, must be sufficiently impervious to used oil to prevent any used oil released into the containment system from migrating out of the system to the soil, groundwater, or surface water.

(f) *Labels.* (1) Containers and aboveground tanks used to store used oil at burner facilities must be labeled or marked clearly with the words "Used Oil."

(2) Fill pipes used to transfer used oil into underground storage tanks at burner facilities must be labeled or marked clearly with the words "Used Oil."

(g) *Response to releases.* Upon detection of a release of used oil to the environment not subject to the requirements of part 280 subpart F which has occurred after the effective date of the authorized used oil program for the State in which the release is located, a

burner must perform the following cleanup steps:

- (1) Stop the release;
- (2) Contain the released used oil;
- (3) Clean up and manage properly the released used oil and other materials; and
- (4) If necessary, repair or replace any leaking used oil storage containers or tanks prior to returning them to service.

[57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26426, May 3, 1993]

§ 279.66 Tracking.

(a) *Acceptance.* Used oil burners must keep a record of each used oil shipment accepted for burning. These records may take the form of a log, invoice, manifest, bill of lading, or other shipping documents. Records for each shipment must include the following information:

- (1) The name and address of the transporter who delivered the used oil to the burner;
- (2) The name and address of the generator or processor/refiner from whom the used oil was sent to the burner;
- (3) The EPA identification number of the transporter who delivered the used oil to the burner;
- (4) The EPA identification number (if applicable) of the generator or processor/refiner from whom the used oil was sent to the burner;
- (5) The quantity of used oil accepted; and
- (6) The date of acceptance.

(b) *Record retention.* The records described in paragraph (a) of this section must be maintained for at least three years.

§ 279.66 Notices.

(a) *Certification.* Before a burner accepts the first shipment of off-specification used oil fuel from a generator, transporter, or processor/refiner, the burner must provide to the generator, transporter, or processor/refiner a one-time written and signed notice certifying that:

- (1) The burner has notified EPA stating the location and general description of his used oil management activities; and

(2) The burner will burn the used oil only in an industrial furnace or boiler identified in § 279.61(a).

(b) *Certification retention.* The certification described in paragraph (a) of this section must be maintained for three years from the date the burner last receives shipment of off-specification used oil from that generator, transporter, or processor/refiner.

§ 279.67 Management of residues.

Burners who generate residues from the storage or burning of used oil must manage the residues as specified in § 279.10(e).

Subpart H—Standards for Used Oil Fuel Marketers

§ 279.70 Applicability.

(a) Any person who conducts either of the following activities is subject to the requirements of this subpart:

- (1) Directs a shipment of off-specification used oil from their facility to a used oil burner; or
- (2) First claims that used oil that is to be burned for energy recovery meets the used oil fuel specifications set forth in § 279.11.

(b) The following persons are not marketers subject to this subpart:

- (1) Used oil generators, and transporters who transport used oil received only from generators, unless the generator or transporter directs a shipment of off-specification used oil from their facility to a used oil burner. However, processors/refiners who burn some used oil fuel for purposes of processing are considered to be burning incidentally to processing. Thus, generators and transporters who direct shipments of off-specification used oil to processors/refiners who incidentally burn used oil are not marketers subject to this Subpart;
- (2) Persons who direct shipments of off-specification used oil and who are not the first person to claim the oil meets the used oil fuel specifications of § 279.11.

(c) Any person subject to the requirements of this Subpart must also comply with one of the following:

- (1) Subpart G of this part—Standards for Used Oil Generators;

Environmental Protection Agency

(2) Subpart E of this part—Standards for Used Oil Transporters and Transfer Facilities;

(3) Subpart F of this part—Standards for Used Oil Processors and Re-refiners; or

(4) Subpart G of this part—Standards for Used Oil Burners who Burn Off-Specification Used Oil for Energy Recovery.

[57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26426, May 3, 1993]

§ 279.71 Prohibitions.

A used oil fuel marketer may initiate a shipment of off-specification used oil only to a used oil burner who:

- (a) Has an EPA identification number; and
- (b) Burns the used oil in an industrial furnace or boiler identified in § 279.61(a).

§ 279.72 On-specification used oil fuel.

(a) *Analysis of used oil fuel.* A generator, transporter, processor/refiner, or burner may determine that used oil that is to be burned for energy recovery meets the fuel specifications of § 279.11 by performing analyses or obtaining copies of analyses or other information documenting that the used oil fuel meets the specifications.

(b) *Record retention.* A generator, transporter, processor/refiner, or burner who first claims that used oil that is to be burned for energy recovery meets the specifications for used oil fuel under § 279.11, must keep copies of analyses of the used oil (or other information used to make the determination) for three years.

[57 FR 41612, Sept. 10, 1992, as amended at 58 FR 26426, May 3, 1993]

§ 279.73 Notification.

(a) *Identification numbers.* A used oil fuel marketer subject to the requirements of this subpart who has not previously complied with the notification requirements of RCRA section 3010 must comply with these requirements and obtain an EPA identification number.

(b) A marketer who has not received an EPA identification number may obtain one by notifying the Regional Ad-

ministrator of their used oil activity by submitting either:

- (1) A completed EPA Form 8700-12; or
- (2) A letter requesting an EPA identification number. The letter should include the following information:

- (i) Marketer company name;
- (ii) Owner of the marketer;
- (iii) Mailing address for the marketer;

(iv) Name and telephone number for the marketer point of contact; and

(v) Type of used oil activity (i.e., generator directing shipments of off-specification used oil to a burner).

[57 FR 41612, Sept. 10, 1992, as amended at 58 FR 33942, June 17, 1993]

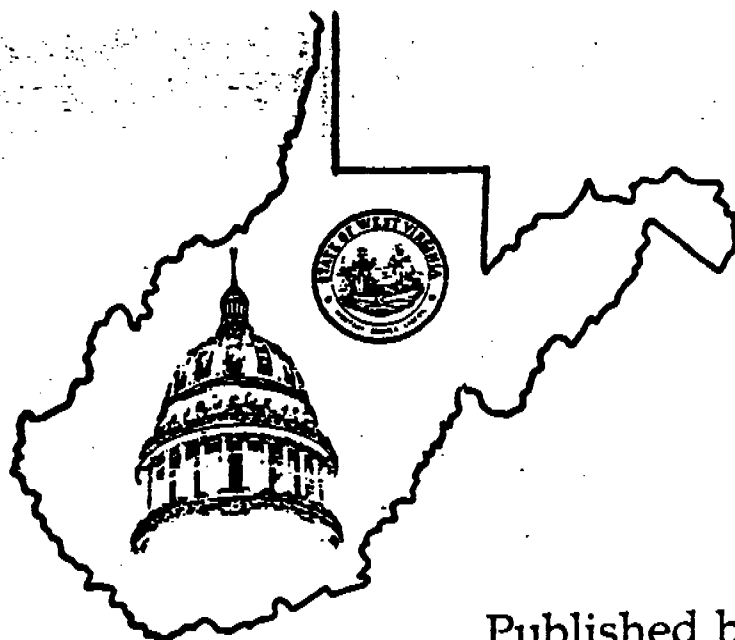
§ 279.74 Tracking.

(a) *Off-specification used oil delivery.* Any used oil marketer who directs a shipment of off-specification used oil to a burner must keep a record of each shipment of used oil to a used oil burner. These records may take the form of a log, invoice, manifest, bill of lading or other shipping documents. Records for each shipment must include the following information:

- (1) The name and address of the transporter who delivers the used oil to the burner;
- (2) The name and address of the burner who will receive the used oil;
- (3) The EPA identification number of the transporter who delivers the used oil to the burner;
- (4) The EPA identification number of the burner;
- (5) The quantity of used oil shipped; and
- (6) The date of shipment.

(b) *On-specification used oil delivery.* A generator, transporter, processor/refiner, or burner who first claims that used oil that is to be burned for energy recovery meets the fuel specifications under § 279.11 must keep a record of each shipment of used oil to an on-specification used oil burner. Records for each shipment must include the following information:

- (1) The name and address of the facility receiving the shipment;
- (2) The quantity of used oil fuel delivered;
- (3) The date of shipment or delivery; and



WEST VIRGINIA REGISTER

Published by Ken Hechler, Secretary of State

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July 12, 1996

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A Weekly Publication

Administrative Law Division

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OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: Division of Environmental Protection, Office of Air Quality TITLE NUMBER: 45
RULE TYPE: Legislative CITE AUTHORITY: W.Va. Code §522-5-1 et seq.
AMENDMENT TO AN EXISTING RULE: YES X NO

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 25

TITLE OF RULE BEING AMENDED: "To Prevent and Control Air Pollution from Hazardous Waste
Treatment, Storage, or Disposal Facilities"

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED:

TITLE OF RULE BEING PROPOSED:

DATE OF PUBLIC HEARING: August 13, 1996 TIME: 6:00 p.m.
LOCATION OF PUBLIC HEARING: Office of Air Quality
1558 Washington Street, East
Charleston, West Virginia 25311

COMMENTS LIMITED TO: ORAL WRITTEN BOTH X
COMMENTS MAY ALSO BE MAILED TO THE FOLLOWING ADDRESS:

G. Dale Farley, Chief
Office of Air Quality
1558 Washington Street, East
Charleston, WV 25311

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


G. Dale Farley

NOTICE OF PUBLIC HEARING ON A PROPOSED RULE

AGENCY: Division of Environmental Protection, Office of Air Quality TITLE NUMBER: 45
RULE TYPE: Legislative CITE AUTHORITY: W.Va. Code §522-5-1 et seq.
AMENDMENT TO AN EXISTING RULE: YES X NO

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 31

TITLE OF RULE BEING AMENDED: "Confidential Information"

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED:

TITLE OF RULE BEING PROPOSED:

DATE OF PUBLIC HEARING: August 13, 1996 TIME: 6:00 p.m.
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The issues to be heard shall be limited to the proposed rule.

ATTACH A BRIEF SUMMARY OF YOUR PROPOSAL


G. Dale Farley

OTHER

WEST VIRGINIA AIR QUALITY BOARD

1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311

OFFICE Telephone (304) 558-4116
SECRETARY OF STATE

Fax: (304) 558-4116

Jul 8 11 04 AM '96

July 2, 1996

The Honorable Ken Hechler
Secretary of State
Administrative Law Division
Building 1, Room 157K
Charleston, WV 25305

RE: Notice of Meeting for Publication
in the West Virginia Register

Dear Mr. Secretary:

In accordance with Chapter 6, Article 9A of the West Virginia Code, notice is hereby given that the West Virginia Air Quality Board (the "Board") will meet on August 12 & 13, 1996 at 9:00 a.m.; hearings will be held in the hearing room located at 1615 Washington Street, E., Charleston, Kanawha County, West Virginia. The Board will consider the following agenda:

I. EVIDENTIARY HEARING

August 12, 1996, Appeal No. 93-06-P, Georgia-Pacific Corporation v. Dale Farley, Chief, Office of Air Quality, Division of Environmental Protection.

III. OTHER BUSINESS

The Board may also consider such other business as it may deem timely and appropriate. The hearings are open to the public.

Sincerely,
Margaret Chico-Eddy
Margaret Chico-Eddy
Clerk of the Boards

FILED

NOTICE OF PUBLIC HEARING AND
PUBLIC COMMENT PERIOD

Jul 10 4 33 PM '96

OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

On Tuesday, August 12, 1996 beginning at 6:00 p.m., the West Virginia Division of Environmental Protection, Office of Air Quality will hold a public hearing on proposed revisions to the following legislative rules:

- 45CSR16 "Standards of Performance for New Stationary Sources"
- 45CSR26 "To Prevent and Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities"
- 45CSR31 "Confidential Information"
- 45CSR34 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63"

Upon authorization and promulgation of revisions to 45CSR16 and 45CSR34, the Office of Air Quality will seek federal delegation of authority from the U. S. Environmental Protection Agency to implement and enforce the revised standards.

Upon authorization and promulgation of revisions to 45CSR26, the rule will be submitted to the U. S. Environmental Protection Agency as part of the State Hazardous Waste Management Program.

The hearing will be held in the Office of Air Quality's Conference Room located at 1658 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written and oral comments by the public will be accepted during the hearing on August 13th and will be made a part of the rulemaking record. The public may also submit written comments by mail or other delivery to the Office of Air Quality through August 13th for inclusion in the rulemaking record at the following address:

G. Dale Farley, Chief
Office of Air Quality
1658 Washington Street East
Charleston, WV 25311-2599

Copies of the proposed legislative rules will be available for public review on or before July 12, 1996 at the Office of Air Quality's Charleston office. The proposed legislative rules will also be available for public review on or before July 12, 1996 at the Office of Air Quality's regional offices located at 109 Adams Street, Room M-2, Fairmont; 1911 Warwood Avenue, Wheeling; and New Creek, WV.



DIVISION OF ENVIRONMENTAL PROTECTION

GASTON CAPERTON
GOVERNOR

1558 Washington Street East
Charleston, WV 25311-2599

LAIDLEY ELI MCCOY PHD.
DIRECTOR

July 10, 1996

Charleston Newspapers
Legal Ad Department
P. O. Box 2993
Charleston, WV 25330

Dear Emerald:

Please publish the attached "Notice of Public Hearing and Public Comment Period" as soon as possible as a Class I legal advertisement in both the Gazette and Daily Mail. The publication must occur no later than Sunday, July 14, 1996 and must not be published on Sunday as a matter of law. We would like the ad to run in the Friday, July 12th editions, if at all possible. 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,

A handwritten signature in black ink that reads "Dale Farley" followed by a stylized flourish.

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

Office of Air Quality
Phone: (304) 558-4022 Fax: (304) 558-3287



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			TOTAL INVOICE AMOUNT					89.76

State of West Virginia,

AFFIDAVIT OF PUBLICATION

I, Sandra Legg of
THE CHARLESTON GAZETTE, & DAILY DEMOCRATIC NEWSPAPER
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published in the city of Charleston, Kanawha County, West Virginia, do solemnly swear that the annexed notice of:

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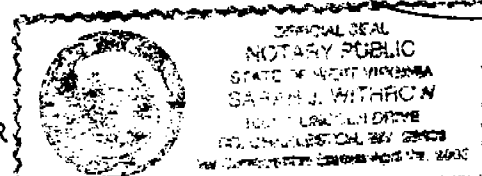
was duly published in said paper(s) during the dates listed below, and was posted at the front door of the court house of said Kanawha County.

West Virginia, on the 15TH day of JULY 1996. Published during the following dates: 07/13/96-07/13/96

Subscribed and sworn to before me this 16 day of July

Printers fee \$ 89.76

Notary Public of Kanawha County, West Virginia



NOTICE OF PUBLIC HEARING AND PUBLIC COMMENT PERIOD

On Tuesday, August 13, 1996 beginning at 6:00 p.m., the West Virginia Division of Environmental Protection, Office of Air Quality will hold a public hearing on proposed revisions to the following legislative rules:

45CSR16 "Standards of Performance for New Stationary Sources"

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45CSR31 "Confidential Information"

45CSR34 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63"

Upon authorization and promulgation of revisions to 45CSR16 and 45CSR34, the Office of Air Quality will seek federal delegation of authority from the U.S. Environmental Protection Agency to implement and enforce the revised standards.

Upon authorization and promulgation of revisions to

45CSR25, the rule will be submitted to the U.S. Environmental Protection Agency as part of the State Hazardous Waste Management Program.

The hearing will be held in the Office of Air Quality's Conference Room located at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written and oral comments by the public will be accepted during the hearing on August 13th and will be made a part of the public rulemaking record. The public may also submit written comments by mail or other delivery to the Office of Air Quality through August 13th for inclusion in the rulemaking record at the following address:

G. Dale Farley, Chief
Office of Air Quality
1558 Washington Street East
Charleston, WV 25311-2599

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(313635)



DIVISION OF ENVIRONMENTAL PROTECTION

1558 Washington Street East
Charleston, WV 25311-2599

LAIDLEY ELI MCCOY PH.D.
DIRECTOR

GASTON CAPERTON
GOVERNOR

July 10, 1996

Wheeling News Register & Intelligencer
Legal Ad Department
1500 Main Street
Wheeling, WV 26062

Dear Sir:

Please publish the attached "Notice of Public Hearing and Public Comment Period" as soon as possible as a Class I legal advertisement. The publication must occur no later than Sunday, July 14, 1996 and must not be published on Sunday as a matter of law. We would like the ad to run in the Friday, July 12th editions, if at all possible. 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,

A handwritten signature in cursive script that reads "Dale Farley" followed by a stylized monogram "DFM".

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

Office of Air Quality
Phone: (304) 558-4022 Fax: (304) 558-3287

NOTICE OF PUBLIC HEARING AND
PUBLIC COMMENT PERIOD

On Tuesday, August 13, 1996 beginning at 8:00 p.m., the West Virginia Division of Environmental Protection, Office of Air Quality will hold a public hearing on proposed revisions to the following legislative rules:

45CSR16 "Standards of Performance for New Stationary Sources"

45CSR25 "To Prevent and Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities"

45CSR31 "Confidential Information"

45CSR34 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63"

Upon authorization and promulgation of revisions to 45CSR16 and 45CSR34, the Office of Air Quality will seek federal delegation of authority from the U.S. Environmental Protection Agency to implement and enforce the revised standards.

Upon authorization and promulgation of revisions to 45CSR25, the rule will be submitted to the U.S. Environmental Protection Agency as part of the State Hazardous Waste Management Program.

The hearing will be held in the Office of Air Quality's Conference Room located at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written and oral comments by the public will be accepted during the hearing on August 13th and will be made a part of the rulemaking record. The public may also submit written comments by mail or other delivery to the Office of Air Quality through August 13th for inclusion in the rulemaking record at the following address:

G. Dale Farley, Chief
Office of Air Quality
1558 Washington Street East
Charleston, WV 25311-2599

Copies of the proposed legislative rules will be available for public review on or before July 12, 1996 at the Office of Air Quality's Charleston office. The proposed legislative rules will also be available for public review on or before July 12, 1996 at the Office of Air Quality's regional offices located at 109 Adams Street, Room M-2, Fairmont; 1911 Warwood Avenue, Wheeling; and New Creek, WV.
N.R. July 12, 1996

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 12, 1996

commencing on the 12 day of July, 1996

Given under my hand this 19 day of July, 1996

Bonnie Mattern

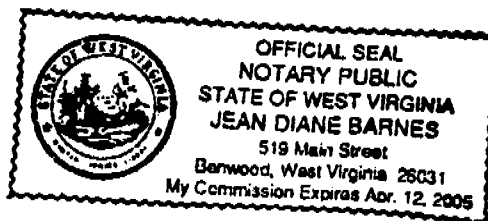
Sworn to and subscribed before me this 19th day of

July 1996 at WHEELING, OHIO COUNTY, WEST VIRGINIA

Jean Diane Barnes
Notary Public

of, in and for OHIO COUNTY, WEST VIRGINIA.

My Commission expires April 12, 2005





DIVISION OF ENVIRONMENTAL PROTECTION

GASTON CAPERTON
GOVERNOR

1558 Washington Street East
Charleston, WV 25311-2599

LAIDLEY ELI MCCOY PH.D.
DIRECTOR

July 10, 1996

Dominion Post
Classified Ad Department
Route 7 Greer Building
Morgantown, WV 26505

Dear Sir:

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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 *23m*

Dale Farley
Chief, Office of Air Quality

DF/tlm

Enclosure

FILED

NOTICE OF PUBLIC HEARING AND
PUBLIC COMMENT PERIOD

JUL 10 4 33 PM '96

OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

On Tuesday, August 13, 1996 beginning at 6:00 p.m., the West Virginia Division of Environmental Protection, Office of Air Quality will hold a public hearing on proposed revisions to the following legislative rules:

- 45CSR16 "Standards of Performance for New Stationary Sources"
- 45CSR25 "To Prevent and Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities"
- 45CSR31 "Confidential Information"
- 45CSR34 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63"

Upon authorization and promulgation of revisions to 45CSR16 and 45CSR34, the Office of Air Quality will seek federal delegation of authority from the U. S. Environmental Protection Agency to implement and enforce the revised standards.

Upon authorization and promulgation of revisions to 45CSR25, the rule will be submitted to the U. S. Environmental Protection Agency as part of the State Hazardous Waste Management Program.

The hearing will be held in the Office of Air Quality's Conference Room located at 1558 Washington Street East, Charleston, West Virginia. The hearing is open to the public. Written and oral comments by the public will be accepted during the hearing on August 13th and will be made a part of the rulemaking record. The public may also submit written comments by mail or other delivery to the Office of Air Quality through August 13th for inclusion in the rulemaking record at the following address:

G. Dale Farley, Chief
Office of Air Quality
1558 Washington Street East
Charleston, WV 25311-2599

Copies of the proposed legislative rules will be available for public review on or before July 12, 1996 at the Office of Air Quality's Charleston office. The proposed legislative rules will also be available for public review on or before July 12, 1996 at the Office of Air Quality's regional offices located at 109 Adams Street, Room M-2, Fairmont; 1911 Warwood Avenue, Wheeling; and New Creek, WV.

OAQ MAILING LIST FOR PUBLIC HEARINGS/MEETINGS

Mr. Larry Myers
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

~~XXXXXXXXXX~~
Charleston Gazette
1002 Virginia Street, East
Charleston, WV 25301

Ms. Joline Brady
103 Timberlake Circle
Scott Depot, WV 25560

Ms. Mildred Holt
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
2300 MacCorkle Avenue, S.E.
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

Mr. Robert Parsons
Jackson & Kelly
1600 Laidley Tower
Charleston, WV 25301

Mr. Ira H. Dorfman
Vice-President, Energy & Environment
Ryan-McGinn
2300 Clarendon Blvd., Suite 610
Arlington, VA 22201

Larry G. Kopelman
No. 9 Pennsylvania Avenue
Charleston, WV 25302

~~Ms. Helen Gibbins~~ *MS Janet Fouty*
Ohio Valley Environmental Coalition
P. O. Box 970
Proctorville, OH 45669

Ms. Helen Gibbins
6128 Gideon Road
Huntington, WV 25705

~~Ms. Missy Woolverton~~
WV Citizen Action Group
1324 Virginia Street, East
Charleston, WV 25301

Ms. Rhonda Hooper
Monsanto
1 Monsanto Road
Nitro, WV 25143

Mr. Richard Poling
Office of Air Quality
Eastern Panhandle Regional Office
P. O. Box 99
New Creek, WV 267143

Ms. Claudia Banner
Appalachian Power Company
P. O. Box 2021
Roanoke, Virginia 24022-2121

Mr. Laidley Eli McCoy
Director, Division of Environmental
Protection
10 McJunkin Road
Nitro, WV 25143-2506

Act Foundation
523 Central Avenue
Charleston, WV 25302

~~Ms. Pamela Nixon~~ *Returned*
406 Grandview Point
Dunbar, WV 25064 *7-18-96*

Mr. Oliver A. Fick
Air Program Manager
Engineering-Science, Inc.
57 Executive Park South, N.E.
Suite 590
Atlanta, Georgia 30329-2265

Mr. Brian Farkas
Public Information Officer
WV Division of Environmental
Protection
10 McJunkin Road
Nitro, WV 25143-2506

Ms. Liz McMeekin
Aristech Chemical Company
600 Grant Street
Pittsburgh, PA 15219

Ms. Liz Schiffer
128 Woodbridge Drive
Charleston, WV 25311

SEP- 6-94 TUE 15:44

DEP NITRO W. VA

FAX NO. 3047590526

P.02

Nat'l Center for Coal &
Energy
P.O. Box 6064
Morgantown, WV 26506-6064

Mr. Norman Steestra
Citizens Action Group
1324 Virginia Street, East
Charleston, WV 25301

Ms. Mary Wimmer
Water Quality Advisory
Committee
251 Laurel Street
Morgantown, WV 26505

Ms. Cindy Rank
WV Highland Conservancy
Route 1, Box 227
Rock Cave, WV 26234

Coal Outlook
1616 N. Fort Myer Drive
Suite 1000
Arlington, VA 22209

Coal Association
1301 Laidley Tower
Charleston, WV 25301

WVMRA
1624 Kanwaha Blvd.
Charleston, WV 25311

Mr. Larry George
Barth, Thompson & George
P. O. Box 129
Charleston, WV 25321

Brett Robinson
Remtech
550 Industrial Drive
Lewisberry, PA 17339-9537

Gerald P. McCarthy
VA Environmental Endowment
Three James Center
P.O. Box 790
Richmond, Va 23206

Pete Pitsenbarger
WVDEP
Abandoned Mine Lands
Nitro, WV 25143

Max Robertson
Office of Waste Management
1356 Hansford Street
Charleston, WV 25301

Office of Water Resources
1201 Greenbrier Street
Charleston, WV 25311

Dale Farley
Office of Air Quality
1558 Washington Street, E.
Charleston, WV 25311-2599

Ted Strait
WVDEP
Oil & Gas
Nitro, WV 25143

John Ailes
WVDEP
Mining & Reclamation
Nitro, WV 25143

Jerome Ashton
Stevens Publishing
1170 National Press Bldg.
Washington, D.C. 20045

WVDEP
Region 1
109 Adams Street
Fairmont, WV 26554-2800

WVDEP
Region 2
105 South Railroad Street
Philippi, WV 26416-9998

WVDEP
Region 3
116 Industrial Drive
Oak Hill, WV 25901-9714

WVDEP
Region 4
331 Court Street
Welch, WV 24801-2311

WVDEP
Region 5
525 Tiller Street
Logan, WV 25601-3438

WVDEP
District 1
1304 Goose Run Road
Fairmont, WV 26554

WVDEP
District 2
#1 Depot Street
Romney, WV 26757

WVDEP
District 3
P.O. Box 38
French Creek, WV 26218

WVDEP
District 4
General Delivery
MacArthur, WV 25873

WVDEP
District 5
694 Winfield Road
St. Albans, WV 25177

Harrison County ECO
P.O. Box 2113
Clarksburg, WV 26302

Millie Johnson
Toyota Motor Slaes, USA, Inc.
1850 M Street, NW
Suite 600
Washington, DC 20036

John Wolmack
IOGA of WV
410 Washington Street, East
Charleston, WV 25301-1522

*Returned
7-17-96*

WV Press Association
3422 Pennsylvania Ave.
Charleston, WV 25302

The Logan Banner
437 Stratton Street
Logan, WV 25601

WVVA-TV
P. O. Box 1930
Bluefield, WV 24701

Charleston Gazette
1001 Virginia Street, E.
Charleston, WV 25301

Dominion Post
Rt. 7 Greer Building
Morgantown, WV 26505

WDTV-TV
5 TV Drive
Bridgeport, WV 26330

Charleston Daily Mail
1001 Virginia Street, E.
Charleston, WV 25301

Parkersburg News
519 Juliana Street
Parkersburg, WV 26101

WQWK - TV
P. O. Box 13
Huntington, WV 25706-00

The Register/Herald
301 N. Kanawha Street
Beckley, WV 25801

Parkersburg Sentinel
519 Juliana Street
Parkersburg, WV 26101

WSAZ-TV
Charleston Bureau
111 Columbia Ave.
Charleston, WV 25302

Bluefield Daily Telegraph
928 Bluefield Ave.
P. O. Box 1599
Bluefield, WV 24701

Point Pleasant Register
200 Main Street
Point Pleasant, WV 25550

WBOY-TV
P.O. Box 1590
Clarksburg, WV 26302

Morning Herald
100 Summitt Avenue
Hagerstown, MD 21740

Weirton Daily Times
114 Lee Ave.
Weirton, WV 26062

WTAP-TV
#1 Television Plaza
Parkersburg, WV 26101

Exponent
324-326 Hewes Ave.
Clarksburg, WV 26301

Wheeling Intelligencer
1500 Main Street
Wheeling, WV 26003

WTRF-TV
P.O. Box 6667
Wheeling, WV 26003

Telegram
324-326 Hewes Ave.
Clarksburg, WV 26301

Wheeling News Register
1500 Main Street
Wheeling, WV 26003

WQBE
Box 871
Charleston, WV 25323

Times - West Virginian
Quincy - Ogden Ave.
P. O. Box 2530
Fairmont, WV 26554

Williamson Daily News
100 Block E. 3rd Ave.
P. O. Box 1660
Williamson, WV 25661

WYVN-TV
P.O. Box 2089
Martinsburg, WV 25401

The Herald Dispatch
P. O. Box 2017
Huntington, WV 25720

The Morning Journal
207 W. King Street
Martinsburg, WV 25401

WEPM
1606 W. King Street
Martinsburg, WV 25401

Mineral Daily News-Tribune
P. O. Box 879
Keyser, WV 26726

The Inter-Mountain
520 Railroad Ave.
Elkins, WV 26241

The Morgan Messenger
104 Merseer Street
P.O. Box 567
Berkeley Springs, WV 25411

Record-Delta
7 N. Locust Street
Buckhannon, WV 26021

The Pendleton Times
P.O. Box 906
Franklin, WV 26807

Preston County Journal
Preston County News
P.O. Box 587
Kingwood, WV 26537

Bramwell Aristocrat
Bank Building
Bramwell, WV 24715

The Gilbert Times
P.O. Box 1135
Gilbert, WV 25621

Post Report
204 C. W. Washington Street
Lewisburg, WV 24907

The Glenville Democrat
The Glenville Pathfinder
P.O. Box 458
Glenville, WV 26351-0458

The Greenbrier Valley
Ranger
P.O. Box 471
Lewisburg, WV 24901

Guyandotte Voice
P.O. Box 4508
Chapmanville, WV 25508

Coal Valley News
P.O. Box 508
Madison, WV 25130

The State Journal
P.O. Box 28
Charleston, WV 25321

The Calhoun Chronicle and
Grantsville News
P.O. Box 400
Grantsville, WV 26147

Hometown News
P.O. Box 597
Madison, WV 25130

West Virginia Beacon
P.O. Box 981
Charleston, WV 25324

The Lincoln Journal
The Weekly News Sentinel
P.O. Box 308
Hamlin, WV 25523

The Pocahontas Times
P.O. Box 117
Marlinton, WV 24954

Spirit of Jefferson
Advocate
P.O. Box 966
Charles Town, WV 25414

The Ritchie Gazette
P.O. Box 215
Harisville, WV 26362

Hinton News
P.O. Box 1000
Hinton, WV 25951

Cabell Record
911 3rd Avenue, Suite 2
Huntington, WV 25701

The Clay Herald
Route 4, Box 5
Clay, WV 25043

Hurricane Breeze
P.O. Box 336
Hurricane, WV 25526

The Montgomery Herald
P.O. Box 240
Montgomery, WV 25136

Wirt County Journal
P.O. Box 309
Elizabeth, WV 26143

Industrial News
P.O. Box 180
Jaeger, WV 24844

The Moorefield Examiner
P.O. Box 380
Moorefield, WV 26836

The Mullens Advocate
217 Moran Avenue
Mullens, WV 25882

Princeton Times
1101 Mercer Street
Princeton, WV 24740

Roane County Reporter
P.O. Box 647
Spencer, WV 25276

Hancock County Courlar
P.O. Box 547
New Cumberland, WV 26047

Times Record
P.O. Box 647
Spencer, WV 25276

Wetzel Chronicle
P.O. Box 289
New Maintinsville, WV 2615

The Jackson Star News
P.O. Box 10
Ravenswood, WV 26164

The Nicholas Chronicle
P.O. Box 503
Summersville, WV 26651

The Valley Press
Twin City Press
P.O. Box 8
Nitro, WV 25143

The News Leader
P.O. Box 591
Richwood, WV 26261

Braxton Citizen's News
P.O. Box 516
Sutton, WV 26601

Fayette Tirbune
P.O. Box 139
Oak Hill, WV 25901

West Virginia Hillbilly
P.O. Box 430
Richwood, WV 26261

Braxton Democrat-Central
P.O. Box 427
Sutton, WV 26601-1399

Parsons Advocate
212 Main Street
Parsons, WV 26287

The Jackson Herald
P.O. Box 31
Ripley, WV 25271

The Monroe Watchman
P.O. Box 179
Union, WV 24983

Pennsboro News
P.O. Box 368
Pennsboro, WV 26415

Hampshire Review
P.O. Box 1036
Romney, WV 26757

Wayne County News
Tri-State Sunday
310 Central Avenue
Wayne, WV 25570

Grant County Press
P.O. Box 39
Petersburg, WV 26847

St. Albans Community News
P.O. Box 1000
St. Albans, WV 25177

The Webster Echo
P.O. Box 749
Webster Springs, WV 26288

Barbour Democrat
P.O. Box 459
Philippi, WV 26416

St. Marys Oracle
P.O. Box 27
St. Marys, WV 26170

The Webster Republican
P.O. Box 749
Webster Springs, WV 26288

The Piedmont Herald
P.O. Box 68
Piedmont, WV 26750

The Shinnston News
P.O. Box 7
Shinnston, WV 26431

The Brooke News
The Follansbee Reiview
P.O. Box 591
Wellsburg, WV 26070

Independent Herald
P.O. Box 100
Pineville, WV 24874

Tyler Star News/County
Journal
P.O. Box 191
Sistersville, WV 26175

Weston Democrat
P. O. Box 968
Weston, WV 26452

Weston Democrat
P.O. Box 968
Weston, WV 26452

SEP- 6-94 TUE 15:45

DEP NITRO W. VA

FAX NO. 3047590526

P. 06

The Herald Record
202 E. Main Street
West Union, WV 26456

The Catholic Spirit
P.O. Box 951
Wheeling, WV 26003

The Putnam Democrat
P.O. Box 179
Winfield, WV 25213

AGENDA

**WV DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
CONFERENCE ROOM
1558 WASHINGTON STREET, EAST
CHARLESTON, WEST VIRGINIA**

**AUGUST 13, 1996
6:00 P.M.**

I. PUBLIC HEARING ON PROPOSED LEGISLATIVE RULES

1. 45CSR16 "Standards of Performance for New Stationary Sources"
2. 45CSR25 "To Prevent and Control Air Pollution From Hazardous Waste Treatment, Storage, or Disposal Facilities"
3. 45CSR31 "Confidential Information"
4. 45CSR34 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 63"

BEFORE THE WEST VIRGINIA DIVISION OF
ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY

In the matter of:

PUBLIC HEARING ON PROPOSED LEGISLATIVE RULES

- 45 CSR 16 "Standards of Performance for New
Stationary Sources"
- 45 CSR 25 "To Prevent and Control Air Pollution
From Hazardous Waste Treatment, Storage,
or Disposal Facilities"
- 45 CSR 31 "Confidential Information"
- 45 CSR 34 "Emission Standards for Hazardous Air
Pollutants Pursuant to 40 CFR Part 63"

Transcript of proceedings had at a public
hearing in the above-styled matter for the West Virginia
Division of Environmental Protection, Office of Air
Quality at the Conference Room, 1558 Washington Street,
East, Charleston, West Virginia, 25305, commencing at 6:00
p.m. on the 13th day of August 1996, pursuant to notice.

P R O C E E D I N G S

MS. CHANDLER: Good evening. This public hearing will now come to order on the 13th day of August, 1996 in the conference room of the West Virginia Division of Environmental Protection in the Office of Air Quality, located at 1558 Washington Street, East, Charleston, West Virginia.

The purpose of this public hearing is to hear discussions on the proposed amendments to the four legislative rules filed in the Secretary of State's Office on July 10, 1996, and noticed in the State Register on July 12, 1996. The rules were noticed in Class I legal advertisement in both the Charleston Daily Mail and the Charleston Gazette. Notice was also sent to various individuals and organizations. This public hearing is being held pursuant to the provisions of 29A of the West Virginia Code, Section 110 of the Clean Air Act.

By way of introduction, my name is Jeanne Chandler with the West Virginia Division of Environmental Protection, Public Information Officer. I will be your moderator for these proceedings.

The hearing procedure this evening will be to introduce each rule individually and allow time for

1 oral comment and then close the hearing for each
2 particular rule. Written comments for any rule may be
3 submitted at the end of the public hearing. For those of
4 you wishing to make formal comments, the sign-up sheet is
5 here and I see everyone has pretty much signed in. I
6 remind you that the comment period will end at the end of
7 the hearing tonight.

8 After review and consideration of all the
9 public comments made on these rules, the Office of Air
10 Quality will make whatever changes to the rules it deems
11 appropriate.

12 The Court Reporter is Ms. Missy L. Young.
13 She's with Thaxton Court Reporters. If anyone desires a
14 transcript of this proceeding, please contact Ms. Young.

15 The purpose of this public hearing is to
16 hear discussion on the proposed amendments to 45 CSR 25,
17 "To Prevent and Control Air Pollution from Hazardous Waste
18 Treatment, Storage or Disposal Facilities." The current
19 version of 45 CSR 25 establishes a program of regulation
20 over the treatment, storage and disposal of hazardous
21 waste in order to achieve and maintain such levels of air
22 quality as will protect the public health and safety and
23 the environment from the effects of improper, inadequate

1 or unsound treatment, storage or disposal of hazardous
2 wastes.

3 The proposed rule changes are required to
4 incorporate new regulations issued by the United States
5 Environmental Protection Agency regarding expanded
6 participation under the Resource Conservation and Recovery
7 Act, which is RCRA. The proposed rule changes will
8 improve the process for permitting facilities that store,
9 treat or dispose of hazardous wastes by providing earlier
10 opportunities for public involvement in the process and by
11 expanding public access to information throughout the
12 permitting process and the operational lives of the
13 facilities.

14 Upon authorization and promulgation of
15 revision to 45 CSR 25, the rule will be submitted to the
16 U.S. Environmental Protection Agency as part of the State
17 Hazardous Waste Management Program. The floor is now open
18 for public comment.

19 Would you please state your name and your
20 affiliation?

21 MR. FOSTER: Robert Foster, Chairman of
22 the Environmental Committee, West Virginia Manufacturers
23 Association. I'm here tonight representing the

1 Association. I'd like to make a few comments regarding
2 Regulation 25 entitled, "To Prevent and Control Air
3 Pollution from Hazardous Waste Treatment, Storage and
4 Disposal Facilities."

5 The West Virginia Manufacturers
6 Association has had a number of significant comments
7 regarding this regulation over the years and many of these
8 continue to be very important to us. Specifically, they
9 are, number one, subpart (c)(c), "Effective Date"; number
10 two, the application to generators; number three,
11 consolidation of rules; and number four, sewage mixtures.

12 Regarding the first one, subpart (c)(c),
13 "Effective Date," first, we note the EPA's final federal
14 counterpart regulation to Regulation 25, which is 40 CFR
15 Parts 264 and 265, subpart (c)(c) as published in the
16 Federal Register on December 6, 1994 with an effective
17 date of June 5, 1995. EPA extended the effective date of
18 the regulation to December 6, 1995 in order to provide
19 industry time for compliance and at least in partial
20 response to legal challenges made to the federal program.

21 Subsequently, on February 9, 1996, EPA
22 provided clarifying amendments to the December 6, 1994
23 rule-making. Now, on June 5, 1996, EPA again extended the

1 effective date for implementation of the regulation out to
2 October 6, 1996.

3 The Manufacturers Association anticipates
4 that federal subpart (c)(c) will be undergoing additional
5 changes. EPA is currently responding to numerous comments
6 regarding the rule and it is expected that additional
7 clarifying Federal Register publications will be
8 forthcoming and will again revise subpart (c)(c)
9 standards.

10 Because these changes will be published
11 after July 1, 1996, the Association urges the Office of
12 Air Quality to accept subpart (c)(c), incorporation by
13 reference, until after federal regulations have been
14 finalized. If the OAQ does not defer to corporation
15 subpart (c)(c) until they are finalized by EPA, then the
16 Association submits that the Office of Air Quality should
17 entertain the promulgation of an emergency rule when the
18 revised federal standards are published to assure that
19 there is conformity between the federal and state
20 programs.

21 At the very least to ensure consistency of
22 the federal regulations for changes at the federal level
23 that have occurred up to July 1, 1996 and to ensure

1 consistency with the Office of Waste Management, Hazardous
2 Waste Management Rule incorporating federal regulations,
3 the Association urges the Office of Air Quality to revise
4 the date of incorporation of the federal regulations for
5 Regulation No. 25 on July 1, 1996.

6 Regarding application to generators, DEP
7 does not have the statutory authority to regulate the
8 emission from generators of hazardous waste under the Air
9 Pollution Control Act, but only the treatment, storage and
10 disposal of waste can create statutory air pollution. We
11 have noted for years that the proposed regulation should
12 not and indeed cannot apply to generators accumulating
13 hazardous waste on site for a period of less than 90 days
14 without express statutory delegation. The Office of Air
15 Quality does not have that legal authority under the Air
16 Pollution Control Act to regulate generators.

17 Even more importantly, we strongly urge
18 the Office of Air Quality to remember that the federal
19 subpart (c)(c) regulations only cover treatment, storage
20 and disposal facilities and large quantity generators.
21 The Office of Air Quality should be careful to tailor its
22 program to match the federal program, especially in cases
23 such as this where the federal government has determined

1 that small-quantity generators simply do not account for
2 enough air pollution to justify this sort of overreaching
3 regulation.

4 As a policy matter, extending regulation
5 to small-quantity generators will not substantially
6 improve air quality, but the burden that it places on the
7 small-quantity generators is great. The Association
8 believes that the Office of Air Quality has no basis in
9 fact for regulating these small entities and we urge the
10 office to reexamine this data in a federal counterpart
11 program.

12 In addition, the Association would like to
13 point out that the OAQ is bound under the Hazardous Waste
14 Management Act and the Air Pollution Control Act not to
15 promulgate regulations more stringent than federal
16 counterpart regulations. This means that an exemption for
17 small-quantity generators must be recognized within this
18 rule. It is a violation of the no-more-stringent-than
19 requirement to regulate tanks that are exempt from
20 regulation under the federal program.

21 If the DEP wants to do this type of
22 situation as its generally been, that the DEP regulation
23 is not more stringent than the federal regulation, it is

1 simply broader than the federal regulation. This is a
2 dissention without difference here where the EPA program
3 expressly contemplates that a certain activity will not be
4 regulated. DEP cannot then choose to regulate that same
5 activity in the same manner that EPA does not. If the
6 Office of Air Quality chooses to take such an approach, it
7 strips all meaning of the no-more-stringent-than
8 requirement. Worse, it exposes the agency to potential
9 suit for failing to meet a statutory requirement.

10 The third issue pertains to consolidated
11 rules. We ask the Office of Air Quality to consider
12 issuing the rule which consolidates the requirements in
13 Reg 25 with those of Hazardous Waste Management
14 Regulation, 47 CSR 35. One of the greatest difficulties
15 facing regulated communities is reconciling multiple
16 regulatory requirements. It would reduce this burden
17 significantly to be able to turn to one regulation that
18 covered all aeration requirements. As it stands now,
19 companies wishing to know how to store a container must
20 turn to Hazardous Waste Management Regulation, Regulation
21 No. 25, and the federal regulations to answer the
22 question. It is preferable to be able to turn to one
23 source of information to answer this question. Not only

1 does this ease the administrative burden on regulating a
2 community, but it also makes it more likely that the
3 regulated community will find all the affable provisions
4 and be able to reconcile them and comply with the
5 requirements. This benefits the agency and the public, as
6 well as the regulated entity.

7 Item number four, domestic sewage
8 mixtures, we have in the past noted and again noted here
9 that mixtures of industrial sewage and hazardous waste
10 that pass through a sewer system to a POTW or privately
11 owned treatment works should not be covered by this rule.
12 Regulation of such waste water is already regulated under
13 the state West Virginia NPDS Program and is subject to ..
14 strict requirements. There is simply no need for
15 additional regulation.

16 There remain other problems with this
17 requirement. First, it is unclear who is regulated, the
18 industry or the POTW. If industry is regulated, at what
19 point does its regulation cease? Does the regulation
20 extend to holding areas within the POTW? Must the POTW
21 meet all the design requirements of Regulation 25? The
22 regulation does not address these problems. Again, the
23 Office of Air Quality should have no practical basis for

1 believing that such regulation is necessary.

2 Finally, the Association suggests that in
3 the event this section is retained, the Office of Air
4 Quality is seriously considering the minimal exemption of
5 wastewater that may contain hazardous waste.

6 Thank you for the opportunity to make
7 these comments.

8 MS. CHANDLER: Thank you, Mr. Foster.
9 Would anyone else like to comment on 45 CSR 25? Mr.
10 White?

11 MR. WHITE: Again, my name is David
12 White. I'm employed with the Office of Air Quality and
13 I'm here as a private citizen commenting on the
14 regulations. I'd like to, first, take an opportunity to
15 respond to Mr. Foster's comments.

16 In regard to his first area regarding the
17 effective dates of the regulation, I would agree in one
18 sense that the updated and changed regulations as of July
19 1st may, in fact, be the most appropriate regulations to
20 adopt by reference. I understand the logistical
21 difficulties in going to notice and a date has to be set
22 and comments be made; however, as up-to-date of a
23 regulation as can be adopted as possible should, in fact,

1 be adopted. However, I would disagree that such adoption
2 should wait until such regulation is finalized as Mr.
3 Foster described it. Any potential changes that may occur
4 through lobbying or any lawsuits that may affect the
5 federal standard should not in any way affect the language
6 that will be adopted and that should be adopted by the
7 State of West Virginia and included in its Regulation 25.

8 In regard to the small-quantity generator,
9 I would again disagree with Mr. Foster that the Office of
10 Air Quality has no authority to regulate such entities.
11 The West Virginia Code provides broad authority to ensure
12 that no emissions create a statutory air pollution, which
13 is broadly defined, and activities of small-quantity
14 generators can and, in fact, do generate such emissions
15 which can and, in fact, do cause statutory air pollution.
16 As such, the West Virginia Code provides ample authority
17 for the promulgation of such regulations, as well does the
18 Hazardous Waste Management Act also provide that basis.

19 In regard to the stringency comments, I'd
20 like to take Mr. Foster's argument, perhaps, to a
21 different area and to suggest that if something is not
22 regulated by the federal government to suggest that West
23 Virginia would have no authority to regulate that would

1 invalidate several regulations, which I do not feel would
2 be in anybody's best interest. For example, Regulation 6,
3 the federal government has no provisions prohibiting the
4 open burning of refuse, the open burning of trash;
5 however, the State of West Virginia has a Regulation 6,
6 which prevents and prohibits such open burning except
7 under very narrow circumstances. To suggest that because
8 there is no comparable federal provision that there is no
9 authority under the Code is inaccurate. As such, because
10 of the potential of small-quantity generators to cause
11 emissions which can and do create statutory air pollution,
12 the West Virginia Code does, in fact, provide authority
13 for the State of West Virginia to promulgate regulations,
14 which control and limit the effects of such emissions.

15 The potential threat of a lawsuit
16 regarding the stringency standards should, in fact, have
17 no bearing on the adoption of such regulations. The DEP
18 should take no concern and it should not react in any way,
19 shape or form to such threats of litigation if, in fact,
20 that is the position of the Manufacturers Association.
21 They certainly have that right to proceed; however, that
22 potentiality should in no way affect the adoption of this
23 regulation.

1 I'd like to go down to his comments
2 regarding the mixture of domestic sewage with hazardous
3 waste. I think this likely bears a direct effect on a
4 facility in the South Charleston area of which I am a
5 resident. Certainly the South Charleston Wastewater
6 Treatment Plant handles hazardous waste. Because of
7 language in current regulations, that facility which, in
8 fact, and in reality is an industrial sewage treatment
9 facility, because it handles a percentage of domestic
10 sewage, it is treated as a publicly owned treatment works;
11 however, that treatment by the DEP is contrary to reality.

12 That facility is owned, controlled and
13 operated by personnel of the Union Carbide Corporation
14 and, as such, is more appropriately defined and should be
15 identified as an industrial sewage treatment facility
16 which does, in fact, handle hazardous waste.

17 To delete the provisions or to provide
18 exemption to that would eliminate the ability of the DEP
19 and the Office of Air Quality to address emissions which
20 are, in fact, coming from that facility. The odors which
21 are experienced by the residents of South Charleston are
22 constant. We smell what's coming out of that facility.
23 We smell sewage odors. We smell organic odors. We smell

1 them every day you pass by that facility. It affects our
2 homes. It affects our lives. It reduces our property
3 values. It interferes with the quiet enjoyment of our
4 property. It, in fact, constitutes a statutory air
5 pollution.

6 To deny the Office of Air Quality the
7 opportunity to regulate those emissions, emissions which
8 can include a wide variety of organic chemicals, including
9 hazardous air pollutants as defined in the Clean Air Act,
10 would be a substantial detriment to the people of South
11 Charleston and deny the Office of Air Quality an
12 opportunity to address a long-term and ongoing problem
13 with significant potential adverse health effects to the
14 residents of South Charleston. I would strongly urge that
15 those regulations not be altered and that, in fact, the
16 Office of Air Quality takes steps and measures to address
17 those emissions.

18 In summary, in general, the adoption of
19 these provisions in Regulation 25, which brings state
20 regulation closer to the federal regulation which adopts
21 those standards which brings the regulated community
22 closer to one standard can only be better, not only for
23 the regulating community, but for the public at-large

1 which are affected by emissions from these facilities and,
2 as such, I would support the proposed changes to
3 Regulation 25.

4 MS. CHANDLER: Thank you, Mr. White.
5 Would anyone else like to comment on Regulation 45 CSR?
6 There being nothing further, this public hearing for 45
7 CSR 25 is concluded.

8 (WHEREUPON, the public hearing
9 was concluded at 6:20 p.m.)

WEST VIRGINIA DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY

STATE OF WEST VIRGINIA,
COUNTY OF KANAWHA, to-wit:

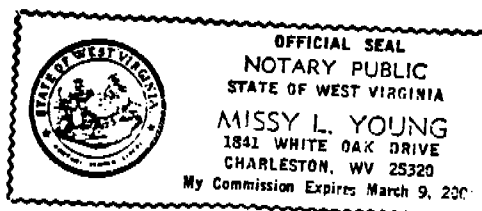
I, the undersigned, Missy L. Young, a
Court Reporter and Notary Public within and for the State
of West Virginia, duly commissioned and qualified, do
hereby certify that the foregoing is, to the best of my
skill and ability, a true and accurate transcript of all
the proceedings had in the aforementioned matter.

Given under my hand and official seal this
19th day of August 1996.

Missy L. Young

Court Reporter
Notary Public

My commission expires March 9, 2004.



**COMMENTS OF THE
WEST VIRGINIA MANUFACTURERS ASSOCIATION
ON THE
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY
TO PREVENT AND CONTROL AIR POLLUTION FROM
HAZARDOUS WASTE
TREATMENT, STORAGE, OR DISPOSAL FACILITIES
45 CSR 25**

August 13, 1996

**COMMENTS OF THE
WEST VIRGINIA MANUFACTURERS ASSOCIATION
ON THE
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF AIR QUALITY**

**TO PREVENT AND CONTROL AIR POLLUTION FROM
HAZARDOUS WASTE
TREATMENT, STORAGE, OR DISPOSAL FACILITIES
45 CSR 25**

AUGUST 13, 1996

I. INTRODUCTION

The Office of Air Quality ("OAQ"), Division of Environmental Protection proposed for promulgation revisions to the "To Prevent and Control Air Pollution from Hazardous Waste Treatment, Storage, or Disposal Facilities," 45 CSR 25, also known as "Reg 25." Director McCoy approved the regulations for filing on July 8, 1996, and the rules were filed with the Secretary of State on July 10, 1996. A public hearing will be held and the public comment period expires on August 13, 1996.

The West Virginia Manufacturers Association ("WVMA") files these comments in accordance with the notice of proposed rule-making discussed above. The WVMA is an organization comprised of a large number of business, manufacturing, and other interests of all sizes located throughout West Virginia. WVMA members are subject to and greatly affected by environmental regulations such as the one now proposed by the Office of Air Quality, and have been interested and involved in legislative and regulatory effort that affect the WVMA community for years. The WVMA seeks to ensure the development of a reasonable and consistent regulatory program.

II. GENERAL COMMENTS

A. Incorporation by Reference

The WVMA continues to support the incorporation of the federal rules by reference as required by W.Va. Code § 22-1-3. Incorporation by reference creates consistency between the federal and state regulatory requirements, avoids duplication and unnecessary lengthy state rules, and provides correlative guidance from the federal programs. However, the incorporation reference of the federal requirements for Subpart CC need to be clarified.

OAQ's efforts here, however, present several difficulties. First, we note that EPA's final federal counterpart regulation to Regulation 25, 40 C.F.R. Parts 264 and 265, Subpart CC, was published in the Federal Register on December 6, 1994, with an effective date of June 5, 1995. 59 Fed. Reg. 62896 (Dec. 6, 1994). EPA extended the effective date of the regulation to December 6, 1995, in order to provide industry time for compliance, and at least in partial response to legal challenges made to the federal program. See 60 Fed. Reg. 26828 (May 19, 1995). Subsequently, on February 9, 1996 provided clarifying amendments to the December 6, 1994 rule-making. 61 Fed. Reg. 4903 (February 9, 1996). In addition, on June 5, 1996, EPA again extended the effective date for implementation of the regulation to October 6, 1996. 61 Fed. Reg. 28508 (June 5, 1996). The WVMA anticipates that the federal Subpart CC will be undergoing additional changes.

EPA is currently responding to numerous comments regarding the rule and it is expected that an additional clarifying Federal Register publication will be forthcoming which again will revise the Subpart CC standards. Because the changes will be published after the July 1, 1996, the WVMA urges the OAQ to except the Subpart CC incorporation by reference until after the federal regulations have been finalized. If the OAQ does not defer incorporating the Subpart CC regulations until

§§ 22-1-3a, 22-5-4(a)(4) and 22-18--6(a) not to promulgate regulations more stringent than federal counterpart regulations. This means that an exemption for small quantity generators must be recognized within this rule -- it is a violation of the "no more stringent than" requirement to regulate tanks that are exempt from regulation under the federal program. DEP's response in this type of situation has generally been that the DEP regulation is not more stringent than the federal regulation, it is simply broader than the federal regulation. This is a distinction without a difference here: where the EPA program expressly contemplates that a certain activity will not be regulated, DEP cannot then choose to regulate that same activity in the same manner that EPA does not. If OAQ chooses to take such an approach, it strips all meaning from the "no more stringent than" requirement. Worse, it exposes the agency to potential suit for failing to meet a statutory requirement.

D. Coordination with Office of Waste Management

The WVMA remains concerned about the OAQ and the OWM coordinating regulatory jurisdiction of permit issuance and regulatory enforcement for hazardous waste treatment, storage and disposal activities. The WVMA acknowledges that cross reference of the respective agency's rules to the other agency's rules may be confusing, but ensures that there are not gaps inadvertently created in the permitting requirements. As an example, the WVMA believes that for public participation requirements in permitting should be addressed only a single time even though both agencies may be preparing separate permits. The permits need to be consistent with each other and the procedure for obtaining a permit needs to be not only consistent, but also avoid duplication. Another example is the requirements of 45 CSR 25, § 4.2 requiring compliance with the personnel training requirements of the federal regulations. These requirements are already captured under the OWM rule requiring under both rules, submission to the DEP Director. Again, there is no reason to

again include this requirement in the rule.

E. Consolidated Rules

The WVMA has repeatedly, and once again, urges the OAQ to consider issuing a rule that consolidates the requirements of Regulation 25 with those of the HWMR, 47 C.S.R. 35. One of the greatest difficulties facing the regulated community is reconciling multiple regulatory requirements, and it would reduce this burden significantly to be able to turn to one regulation that covered all air emission requirements. As it stands now, companies wishing to know how to store a container must turn to the HWMR, Regulation 25, and federal regulations to answer the question. It is preferable to be able to turn to one source of information to answer this question. Not only does these ease the administrative burden on the regulated community, it also makes it more likely that the regulated community will find all the applicable provisions, be able to reconcile them, and comply with the requirements. This benefits the agency and the public as well as the regulated entity.

F. Regulation Under Both Chapter 22, Article 5 (Air) and Chapter 22, Article 18 (Hazardous Waste) of the West Virginia Code

The WVMA has historically objected to the dual invocation of authority under both the Hazardous Waste Management Act and the Air Pollution Control Act for this regulation. We have consistently pointed out that the OAQ has not made the necessary determination that Regulation 25 is required to carry out some purpose under the Air Pollution Control Act. Regulation 25 was adopted for the purpose of receiving delegation of the federal hazardous waste program under the RCRA, and is largely modeled after federal regulations governing emissions from tanks and containers. We encourage DEP to issue Regulation 25 under the authority of the Hazardous Waste Management Act alone, which will better conform to the intent of the regulation and better assist the

regulated community in understanding and complying with the regulation.

III. SPECIFIC COMMENTS

A. Effective Date -- Section 1.5.b

As discussed above, the effective date of the rule should correspond to the effective date of the OWM incorporation by reference date of July 1, 1996, so that the regulatory standards are identical and all federal regulatory activity promulgated in the Federal Register is captured. The regulations then will be as up to date as can be expected.

B. Application to Generators -- Section 1.1.b

As discussed above, the current proposed amendment to Regulation 25 covers more than the treatment, storage, and disposal facilities and large quantity generators regulated by the federal program. The WVMA urges OAQ to correct the error to make the two programs compatible. If for some reason OAQ believes the more stringent regulation is justified, the OAQ must supply scientifically supportable evidence that the rule should be more stringent than the federal counterpart regulation.

C. Application to Wastewater Treatment Units -- Section 5

The WVMA has repeatedly objected to deletion of the exemption that the federal regulations provide to wastewater treatment plants. Mixtures of industrial sewage and hazardous wastes that pass through a sewer system to a private, or public, publicly owned treatment works ("POTW") should not be covered by this rule. Regulation of such wastewater is already regulated under the state WV/NPDES program and is subject to stringent requirements. There is simply no need for additional regulation here. The WVMA suggests that this section be deleted, but in the event this section is retained, the OAQ should seriously consider a "de minimis" exception for wastewater that may

contain hazardous wastes.

D. Duplication of Hazardous Waste Management Regulations - Sections 4.12 & 7

In accordance with the recommendation for cooperation and coordination between the OAQ and the OWM, the personnel training requirements set forth in Section 4.12, are already covered by the Hazardous Waste Management Regulations and must be submitted to the DEP. The WVMA recommends this section be deleted because it duplicates an already applicable requirement and creates confusion among the regulated community.

The rule proposes to revise Section 7, Public Participation, by including reference to 40 CFR § 270.2, 270.14, 270.30, 270.26, and 270.66. The WVMA is agreeable to the public participation requirements because these sections mirror the federal regulations. However, these sections have already be incorporated by reference in 47 CSR 35, § 11 which is referenced by 45 CSR 25, § 7 and incorporated by reference in 45 CSR 25 § 1.5.b. In addition, the public participation requirements contained in the OWM Hazardous Waste Management Regulations are more elaborate and detailed than the federal rule and are in addition to the federal rule which is also incorporated into the Hazardous Waste Management Rules. Therefore, the citation to specific Part 270 references would not be necessary if a single rule were adopted.

III. CONCLUSION

The WVMA is committed to ensuring reasonable regulatory standards, and in the spirit of continued cooperation, submits these comments in anticipation that the OAQ will give them due consideration. If the OAQ has any questions or if additional information is desired, please contact the WVMA at you earliest possible convenience.

Respectfully submitted this 13th day of August, 1996.

Karen S. Price/R. & Foster
Karen S. Price, President
West Virginia Manufacturers Association
2001 Quarrier Street
Charleston, West Virginia 25311
(304) 342-2123

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8/13/96

Tammy

**The
West Virginia Mining and
Reclamation Association**

1624 Kanawha Blvd., E, Charleston, WV 25311

**and the
West Virginia Coal
Association**

1301 Laidley Tower, Charleston, WV 25301

comments in response to

The Proposed 4 Sets of Legislative Rules

45 CSR Series' 16, 25, 31 & 34

Division of Environmental Protection,

August 13, 1996

The West Virginia Mining & Reclamation Association and the West Virginia Coal Association submit the following comments, this 13th day of August, 1996, in response to the four (4) sets of Proposed Legislative Rules, 45 CSR Series' 16, 25, 31 & 34, Division of Environmental Protection, Office of Air Quality:

Page 1 of 2

I. ABOUT THE PUBLIC COMMENT OPPORTUNITY:

A. OUR REPRESENTATION:

The West Virginia Mining and Reclamation Association and the West Virginia Coal Association represent over 400 coal producing companies and associate member companies who provide products and services to the coal industry. Our comments on these proposed rules are on behalf of all of the members of the WVMRA and the WVCA.

B. OUR APPRECIATION FOR THIS OPPORTUNITY:

We are grateful for this opportunity to offer comments on these Legislative Rules.

II. BACKGROUND ON THE WEST VIRGINIA COAL INDUSTRY:

The coal mining industry in West Virginia produces hundreds of millions of tons of high quality coal for domestic and foreign use as an energy source for the production of electricity, steel and a host of other applications. Employment directly in West Virginia mines and indirectly in the mining support trades and the hundreds of millions of dollars of taxes generated by coal related sources are the **economic backbone** of the Mountain State.

A recent study found that one out of every ten payroll dollars in West Virginia comes from the coal industry. It was further revealed that one of every three business tax dollars being collected by the State comes directly from the coal industry.

Every influence which alters the production of West Virginia coal changes the fragile **competitive balance** between coal mines here and coal mines in other coal producing states and other nations. Therefore, changes in the governmental regulations affecting this industry must be made with the potential negative impacts of those changes foremost in the minds of those considering such changes.

The West Virginia Mining & Reclamation Association and the West Virginia Coal Association submit the following comments, this 13th day of August, 1996, in response to the four (4) sets of Proposed Legislative Rules, 45 CSR Series' 16, 25, 31 & 34, Division of Environmental Protection, Office of Air Quality:

Page 2 of 2

III. OUR COMMENTS ABOUT THE PROPOSED LEGISLATIVE RULE:

We have distributed copies of the proposed rule changes to members of our associations, and our respective staffs have preliminarily reviewed the proposed language. It is not yet clear how the proposed rules affect the coal mining industry, therefore we offer no specific comments during this public comment period.

We do, however, reserve the privilege to offer comments at a later date to the agency or to the legislature on this matter.

Again, we are grateful to Division of Environmental Protection for providing this opportunity for comments and amendments.

August 13, 1996

100-313-143

G. Dale Farley
Chief, Office of Air Quality
1558 Washington Street East
Charleston, WV 25311-2598

SUBJECT: Public hearing on proposed rule changes

General Comment:

I did not have the opportunity to go to Wheeling to read the proposed rule changes. In the future please make this information readily accessible at our public libraries.

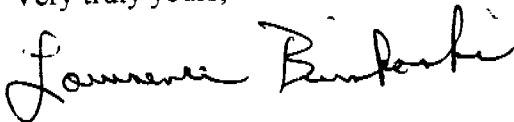
Comments on 45CSR25:

1) Facilities that treat, store, recycle, and/or dispose of hazardous waste should only be permitted in areas that are officially zoned to accept them. Facilities that establish themselves in unzoned areas are compromising the quality of life for many West Virginians.

2) The above facilities should not be permitted in the floodplain.

3) Facilities that recycle hazardous waste should not be exempt from hazardous waste regulations.

Very truly yours,



Lawrence Binkoski
PO box 1031
New Cumberland, WV 26047

45CSR25

TO PREVENT AND CONTROL AIR POLLUTION FROM HAZARDOUS WASTE TREATMENT, STORAGE, OR DISPOSAL FACILITIES

RESPONSE TO COMMENTS

At the public hearing on proposed revisions to 45CSR25 conducted on August 13, 1996, the West Virginia Manufacturers Association (WVMA) presented oral comments. One commenter did not offer comments directly on the proposed rule, therefore no responses were required. The Division of Environmental Protection Office of Air Quality (OAQ) also received two written comments on the rule. The comment is from WVMA and from a citizen of New Cumberland. The OAQ has summarized these comments and provides the following response.

I. Commenter: West Virginia Manufacturers Association

COMMENT A. Incorporation by Reference.

The current proposal to incorporate Subpart CC, 40 CFR Parts 264 and 265, present certain difficulties. USEPA has recently extended the effective date of Subpart CC to October 6, 1996, 61 Fed. Reg. 28508 (June 5, 1996). Therefore, the OAQ is urged to except the Subpart CC incorporation by reference until after federal regulations have been finalized. To ensure consistency, the WVMA requests that the OAQ incorporate the federal regulations in effect on July 1, 1996.

RESPONSE A. The OAQ disagrees with the comment and points out that the proposed rule incorporates by reference a final rule promulgated by the USEPA on December 6, 1994. The fact that the final rule provides for a delayed effective date or series of the effective dates does not present an issue of prospective rulemaking or unlawful delegation of authority (addressed by the West Virginia Supreme Court in State v. Grinstead, 157 W.V. 1001; 206 S.E. 2d912 (1974). In that case, the Court determined that an agency cannot attempt to adopt by reference federal regulations that have not yet been finally promulgated since the content of such regulations is unknown and uncertain. In the instant case however, Subpart CC is a final rule; its contents are known. The delayed compliance dates are simply part of the final rule that the agency is adopting.

Regarding the effective date, the proposed 45CSR25 Section 3.2 addressed the provisions contained in the Code of Federal Regulations (July 1, 1996). Furthermore, Table 25-A identifies the new rule (underlined) to be adopted by reference.

COMMENT B. Stringency determination

This comment noted that the incorporation of the "stringency determination" section of the rule is inappropriate. Additional provisions set forth in the proposed rule are more stringent than the federal requirements.

RESPONSE B. OAQ's response is the same as that contained in Response C below, i.e., the proposed rule does not violate provisions of W. Va. Code §22-1-3a by being more stringent than the federal counterpart regulation. Therefore, no justification is necessary.

COMMENT C. Application to Generators

The OAQ does not have the statutory authority under the Air Pollution Control Act to regulate generators of hazardous waste, only the authority to regulate the treatment, storage or generators of hazardous waste. Subpart CC, Part 264 and 265 of the federal regulations only covers treatment, storage and disposal facilities ("TSDs") and large quantity generators ("LQGs"). It is suggested

that the OAQ should be careful to tailor its program to match the federal program, and not adopt rules more stringent than the federal counterpart regulations, and that an express exemption for small

quantity generators be included in the rule.

RESPONSE C. The OAQ disagrees with the comment that it does not have statutory authority to regulate generators of hazardous waste. The terms of the Air Pollution Act provide that the Director is authorized and empowered to develop ways and means for the regulation and control of pollution of the air of the State. As the generation and accumulation of hazardous waste may result in emission of pollution to the air of the State, the authority of the Air Pollution Control Act can provide the basis for the regulation of hazardous waste generators in 45CSR25.

Regarding the scope and applicability of Subpart CC to treatment, storage or disposal units and to large quantity generators, the OAQ intends to interpret and apply 45CSR25 consistent with the federal regulations and to the extent there are any express federal exemptions contained in the Subpart CC, OAQ will so apply the regulation. As the Commenter suggests, the OAQ will carefully examine the language in Subpart CC to determine its scope and applicability. The agency does not agree, however, that repeating any such exemption in 45CSR25 is necessary since such language would be redundant. Accordingly OAQ's interpretation and application of this rule should not result in a more stringent approach than that contained in the federal regulation with respect to the issue of the applicability of Subpart CC.

COMMENT D. Coordination with Office of Waste Management (OWM)
The OAQ 45CSR25 and OWM 47CSR35 coordinate regulatory jurisdiction of permit issuance and regulatory enforcement for hazardous waste treatment, storage and disposal activities. The public participation requirement in permitting and personnel training is a duplication of 47CSR35 requirements.

RESPONSE D. OAQ has in fact made efforts to coordinate the two sets of regulations in the past and intends to continue such efforts in the future. OAQ's response is the same as that of response J regarding public participation and personnel training comments.

COMMENT E. Consolidated Rules
The OAQ should consolidate the requirements of 45CSR25 with those of 47CSR35 so that the regulated community can look to one rule covering all air emission requirements.

RESPONSE E. The OAQ disagrees with the comment. Both the Office of Waste Management and the Office of Air Quality have legal authority and jurisdiction to regulate air emissions from hazardous waste facilities. The OAQ, however, recognizes the need to eliminate any unnecessary duplication and/or inconsistencies between the two programs and the OAQ has attempted to draft 45CSR25 with that purpose in mind. Incorporation by reference of the requirements of 47CSR35 should greatly assist in this regard.

COMMENT F. Regulation Under Both Chapter 22, Article 5 (Air) and Chapter 22, Article 18 (Hazardous Waste) of the West Virginia Code.
45CSR25 should not be issued under both the authority of W.Va. Code §22-5-1 et seq. (Air Pollution Control Act) and W.Va. Code §22-18-1 et seq. (Hazardous Waste Management Act). Rather 45CSR25 should be issued only under the authority of the Hazardous Waste Management Act. 45CSR25 is not necessary to carry out some purpose under the Air Pollution Control Act.

RESPONSE F. Both the Hazardous Waste Management Act and the Air Pollution Control Act provide the authority and responsibility to the Director for promulgation of regulations to control and

prevent air pollution from hazardous waste facilities. In particular, W. Va. Code §22-5-4 authorizes and empowers the Director to develop ways and means for the regulation and control of the air of State and to promulgate legislative rules relating to the control of air pollution. Such language provides adequate and independent authority for the promulgation of 45CSR25. Promulgation of 45CSR25 furthers the policy and purpose of the State of West

Virginia to achieve and maintain such levels of air quality as will protect human health and safety and prevent injury to plant and animal life.

COMMENT G. Effective Date -- Section 1.5.b

The comment repeats Comment A above.

RESPONSE G. OAQ's response is the same as that contained in Response A above.

COMMENT H. Application to Generators -- Section 1.1.b

The comment repeats the Comment C above.

RESPONSE H. OAQ's response is the same as that contained in Response C.

COMMENT I. Application to Wastewater Treatment Units -- Section 5

45CSR25 is unnecessary and is duplicative of the requirements under the West Virginia NPDES program. There is no need for additional regulation and suggest that this section be deleted.

RESPONSE I. OAQ disagrees. The West Virginia NPDES program is concerned only with effects upon the surface waters associated with wastewater treatment facilities, and does not cover any impacts related to air emissions from such facilities. The primary purpose of Section 5 of 45CSR25 is to regulate air emissions. The commenter's concerns about the way in which Section 5 is to be interpreted and applied are more appropriately handled on a case by case basis rather than wholesale revision of the rule. However, OAQ does acknowledge that the subject of hazardous waste and wastewater treatment facilities is currently the subject of debate at the federal level and we anticipated guidance from EPA in the future on this subject. OAQ is following such developments and may at some point in the future propose revisions to this rule. At that point in time, the concept of de minimis levels of wastewater should be discussed.

COMMENT J. Duplication of Hazardous Waste Management Regulation - Section 4.12 & 7

The personnel training requirements and public participation requirements should be deleted in 45CSR25. The Hazardous Waste Management Regulations (47CSR35) already covered this section.

RESPONSE J. OAQ disagrees. The permitting process for an incinerator or any combustion units requires personnel training programs. Personnel training for combustion unit operations and any air emitting unit operations is important to eliminate any release of air pollutants in the air.

The proposed rule expands public participation consistent with revisions to the underlying federal rules. This rule will require combustion facilities (i.e., incinerators and other facilities that burn hazardous wastes) to notify the public before they conduct a trial burn. Combustion facilities are required to conduct a trial burn to demonstrate that the combustion unit can meet the stringent regulatory performance standards for treatment of hazardous wastes. The 47CSR35 Section 11 Public Participation is applicable for other hazardous waste air emitting units (not a combustion unit) such as containers, tanks and surface impoundments.

II. Commenter: **Citizen of New Cumberland**

COMMENT A. *Facilities that treat, store, recycle and/or dispose of hazardous waste should only be permitted in areas that are officially zoned to accept them. Facilities that establish themselves in unzoned areas are compromising the quality of life for many West Virginians. The facilities should not be permitted in the floodplain. Facilities that recycle hazardous waste should not be exempt from hazardous waste regulations.*

RESPONSE A. Currently, there are no statewide zoning requirements in West Virginia for hazardous waste facilities. Rather, zoning restrictions are a matter of local, municipal, or county law. The commenter's concerns regarding floodplain siting and recycling of hazardous wastes are addressed by 45CSR35, which are regulations of the OWM.

Division of Environmental Protection

Receiving Comments on: Regulations 16, 25, 31, & 34 Time/Date: Aug 13, 1996 6:00 pm

COMMENT

NAME

ADDRESS

YES NO

1. Bob Foster	W.V. Mfg. Assoc. - Ches	X	
2. Steve White	ACT Foundation - Ches	✓	
3. DAVID WHITE	1801 BEECHWOOD DR. S. CHAS	✓	
4. Ken Ward	1001 Virginia St, E Ches		✓
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