

20.0 REGULATION OF INCINERATORS

20.1 Standards For Non-Infectious Waste Incinerators

- A. On or after October 1, 1972, no incinerator shall be installed or operated except as follows or as required by the Director:
1. Comply with emission standards set forth in Table IV and Section 17.0, Regulation of Visible Emissions.
 2. No person shall construct an incinerator having a capacity of 100 pounds or less.
 3. It is provided with an auxiliary burner for purposes of maintaining a temperature of at least 800°F in the primary combustion chamber.
 4. It has equipment which is demonstrated to the Director to be effective in destroying smoke and odors; such as a secondary burner.
 5. It is a type of incinerator design that can be demonstrated to the Director to be effective in accordance with all provisions of this section. The burden of proof shall rest upon the owner of the proposed incinerator.
 6. Any other provisions of this section notwithstanding, no person shall operate an incinerator used for the disposal of refuse produced by fewer than 51 families.
 7. No persons shall make any repairs or alterations to an incinerator which will cost more than 20 percent of the replacement cost of the incinerator unless such repairs or alterations will result in a final installation which will meet the requirements of these regulations for incinerators.
 8. Incinerators having a minimum charging rate of 100 to 600 pounds per hour shall be used for incineration of Type 0 and Type 1 waste exclusively except as approved by the Director.
 - a. Type 0 - Trash, a mixture of highly combustible waste such as paper, cardboard, cartons, wood boxes, and combustible floor sweepings from commercial and industrial activities. This mixture shall not contain oily rags, rubber scraps, or any putrescible matter. This type of waste shall not contain more than 10 percent moisture or 5 percent non-combustible solids.
 - b. Type 1 - Trash, a mixture of highly combustible waste such as paper, cardboard, cartons, wood boxes, and combustible floor sweepings from

commercial and industrial activities. This mixture shall not contain oily rags, rubber scraps, or any putrescible matter. This type of waste shall not contain more than 25 percent moisture or 10 percent non-combustible solids.

- c. Type 2 - An approximately even mixture of rubbish and garbage by weight. This type of waste, common to apartment and residential occupancy, consists of up to 50% moisture and 7% incombustible solids, and has a heating value of 4,300 BTU per pound as fired.
 - d. Type 3 - Garbage such as animal and vegetable wastes from restaurants, hotels, markets, and similar installations. This type of waste contains up to 70% moisture and up to 5% incombustible solids, and has a heating value of 2,500 BTU per pound as fired.
 - e. Type 5 - Gaseous, liquid, or semi-liquid by-product waste, such as tar, paint, solvent, sludge, and fumes from industrial operations. BTU values must be determined by the individual materials to be destroyed.
9. The burning of plastics shall not be permitted in any incinerator having a capacity of 600 lbs./hr. or less, except under conditions to be determined by the Director.
- B. On or before October 1, 1972, all existing incinerators shall meet the standards for particulate emissions as set forth in Column B, Table IV.
 - C. On or after the effective date of these regulations, all new incinerators shall meet the particulate emission standards as set forth in Column A, Table IV.
 - D. On or before July 1, 1975, all incinerators shall meet the new particulate emission standards as set forth in Column A, Table IV.

TABLE IV		
MAXIMUM ALLOWABLE PARTICULATE EMISSION STANDARDS FOR INCINERATORS		
Rated or Operating Charging Rate in Pounds Per Hour	Emission Standard in Percent of Charging Rate	
	A	B
	New Incinerator	Existing Incinerator
100 to 199	0.2	0.6
200 to 599	0.2	0.4
600 to 2,000	0.075	0.4
Greater than 2,000	0.075	

20.2 Standards For Infectious Waste Incinerators

A. General

1. Incinerators which burn infectious waste generated by hospitals, nursing homes, or ambulatory surgical treatment centers as such facilities are defined in T.C.A. Section 68-11-201 are subject to the provisions of this section.
2. An owner or operator shall not burn infectious waste except in a multiple-chamber incinerator with a solid hearth, or in a device found to be equally effective for the purpose of air contaminant control as an approved multiple-chamber incinerator as determined by the Director, but not as described in Section 20.2-E.1.c.

B. Existing Source Compliance Schedules

1. Incinerators in existence before November 6, 1988, must be in compliance on or before 18 months from November 6, 1988, with the standards and requirements of this section. Each owner or operator of an existing incinerator shall either demonstrate compliance with the requirements of this section or submit a compliance schedule detailing the plan of action to achieve compliance within the above 18 month time frame to the Director within 180 days from November 6, 1988.

2. Individual compliance schedules for existing incinerators approved under this rule must contain the following increments of progress and achieve final compliance with the specified emission standards and requirements.
 - a. Date contract will be awarded.
 - b. Date initial construction will commence.
 - c. Date construction will be completed.
 - d. Date final compliance will be achieved.
 - e. Date of compliance demonstration.
3. The individual compliance schedule must be received and approved by the Director prior to the date of the first increment of progress.

C. Definitions

Unless specifically defined in this section, the definitions from Section 13.0 will apply:

1. "Incinerator" means any device used in the process of controlled combustion of waste for the purpose of reducing the volume and minimizing the potential for harm to public health from the waste charged by destroying combustible matter leaving the noncombustible ashes or residue.
2. "Infectious waste" means solid or liquid wastes which contain pathogens with sufficient virulence and quantity such that exposure to the waste by a susceptible host could result in an infectious disease. For purposes of this rule, all of the following types of waste shall be considered to be infectious waste:
 - a. Wastes contaminated by patients who are isolated due to communicable disease, as provided in the U.S. Centers for Disease Control Guidelines for Isolation Precautions in Hospitals (July, 1983).
 - b. Cultures and stocks of infectious agents: including specimen cultures collected from medical and pathological laboratories, cultures and stocks of infectious agents from research and industrial laboratories, wastes from the production of biologicals, discarded live and attenuated vaccines, and culture dishes and devices used to transfer, inoculate, and mix cultures.
 - c. Waste human blood and blood products such as serum, plasma, and other blood components.

- d. Pathological waste, such as tissue, organs, body parts, and body fluids that are removed during surgery and autopsy.
 - e. All discarded sharps (e.g., hypodermic needles, syringes, pasteur pipettes, broken glass, scalpel blades) used in patient care or which have come into contact with infectious agents during use in medical, research, or industrial laboratories.
 - f. Contaminated carcasses, body parts, and bedding of animals that were exposed to pathogens in research, in the production of biologicals, or in the in vivo testing of pharmaceuticals.
 - g. Other waste determined to be infectious by the facility.
3. "In existence" means that the owner or operator has obtained all necessary preconstruction approvals or permits required by this Department and either has (1) begun, or caused to begin, a continuous program of physical on-site construction of the facility, or (2) entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of construction of the facility to be completed in a reasonable time, or (3) that the owner or operator possesses a valid operating permit.
 4. "Continuous program of physical on-site construction" means significant and continuous site preparation work such as major clearing or excavation followed by placement of footings, pilings, and other materials of construction, assembly, or installation of unique facilities or equipment at the site of the source.
 5. "Substantial loss" generally means a loss which would equal or exceed 10 percent of the total project cost.
 6. "Anti-neoplastic agents" means chemotherapy drugs or compounds used in treatment of cancer. For the purpose of this rule containers or other items containing residues of anti-neoplastic agents shall not be considered anti-neoplastic agents.
 7. "Residues of anti-neoplastic agent" means the portion of the compound that remains in a container or other item after all the compound has been removed using the practices commonly employed to removed materials from that type of container, e.g., pouring, pumping, and aspirating; and no more than 2.5 centimeters (one inch) of material remain on the bottom of the container or other item, or no more than 3 (three) percent by weight of the total capacity of the container remains in the container or other item.

8. "Multiple-chamber incinerator" means an incinerator consisting of at least two refractory lined combustion chambers (primary and secondary) in series, physically separated by refractory walls, interconnected by gas passage ports or ducts.
9. "Afterburner" means an auxiliary burner for destroying unburned or partially burned combustion gases after they have passed from the combustion chamber.
10. "Batch incinerator" means an incinerator that is loaded while the chamber(s) is cold and is not recharged until the burndown cycle is complete.
11. "Biologicals" means noxious organisms.

D. Emission Standards

1. Particulate matter shall not be in excess of 0.1 grains per dry standard cubic foot of exhaust gas corrected to 12 percent CO₂.
2. The Director shall specify on the construction and/or operating permits as permit conditions the hydrogen chloride (HCl) emission level that is reasonable available control technology (RACT) so that the air quality impact from a source shall not exceed 70.0 micrograms per cubic meter HCl, 24 hour average. The owner or operator of the infectious waste incinerator may choose to limit the operating hours of the source to meet the impact level.
3. Visible Emission Standards
 - a. No owner or operator subject to the provisions of this section shall cause to be discharged into the atmosphere from any affected facility any gases which exhibit greater than 10 percent opacity (6-minute average), except for one 6-minute period per hour of not more than 20 percent opacity. This opacity standard shall not apply to burner startups when only firing auxiliary fuel without waste being burned.

E. Performance Specifications

1. Temperature and Residence Time Requirements
 - a. The incinerator secondary chamber shall be maintained at a minimum temperature of 1600°F, except as specified in Subparagraph c of this paragraph.
 - b. The minimum secondary chamber residence time for those incinerators not in existence on November 6, 1988, shall be 1.0 second. The minimum secondary chamber residence time for incinerators in existence

on November 6, 1988, shall be sufficient to prevent excess visible emissions as specified in Subsection 20.2-D.3.a.

- c. Owners or operators which have an incinerator in existence on November 6, 1988, without a secondary chamber and equipped with an afterburner operated at a minimum temperature of 1600°F may choose to meet a more restrictive visible emission standard of zero percent opacity in lieu of meeting the secondary chamber requirements. The opacity shall be evaluated using Tennessee Visible Emission Evaluation (TVEE) Method 3 approved by the Tennessee Air Pollution Control Board on December 12, 1984, and amended on May 30, 1985, and included in the State Implementation Plan. TVEE Method 3 was approved by EPA on March 19, 1986, and published in the Federal Register, Vol. 51, No. 53, Page 9445, May 19, 1986.
 - d. An infectious waste incinerator used to combust anti-neoplastic agents must be operated with the secondary chamber at a minimum exit temperature of 1800°F with a secondary chamber design residence time of not less than 1.5 seconds.
2. The firing of the incinerator burners shall be controlled automatically to maintain the specified minimum secondary chamber or afterburner temperature.
3. Charging Systems
- a. Incinerators shall be equipped with an automatic mechanical loading device, and an interlock system shall be provided to prevent charging until the secondary chamber exit temperature of 1600°F is established except as provided for below.
 - b. The owner or operator of an incinerator, except a batch incinerator, in existence on November 6, 1988, which is manually fed may submit a written request to the Director that manual feeding be allowed. The request must include a plan detailing the methods and operating procedure to be employed in manually charging the incinerator. The Director shall determine if the plan provided is acceptable. The plan must be submitted to the Director within 180 days of November 6, 1988, and the operation of the incinerator by this plan shall become a condition of the operating permit.
 - (i) The owner or operator of the incinerator must post or file on the operating premises a copy of the approved plan.

- (ii) The approval of the plan shall not relieve the owner or operator of the duty to comply with all other applicable emission requirements.
 - (iii) Any violation of the permit conditions or other requirements of this section may result in the Director requiring that an automatic mechanical loading device be installed.
- c. Batch incinerators shall incorporate a lockout system which will prevent ignition of the waste until the exit temperature of the secondary chamber or the afterburner reaches 1600°F and prevent recharging until the combustion and burndown cycles are complete.

4. Startup and shutdown requirements

- a. No waste shall be charged to an incinerator other than a batch incinerator until the secondary chamber or afterburner has achieved a minimum temperature of 1600°F, except as specified in Subparagraph b of this paragraph. The secondary chamber or afterburner must achieve and maintain the required minimum temperature for 15 minutes before charging begins.
- b. No waste shall be charged to an incinerator used to combust anti-neoplastic agents until the secondary chamber has achieved a minimum temperature of 1800°F. The secondary chamber must achieve and maintain the required minimum temperature for 15 minutes before charging begins.
- c. During incinerator shutdowns the secondary chamber or afterburner minimum temperature of 1600°F is to be maintained using auxiliary burners until the wastes are completely combusted and the burndown cycle is complete. For incinerators used to combust anti-neoplastic agents, the secondary chamber must be maintained at a minimum temperature of 1800°F during a shutdown until all wastes are completely combusted and the burndown cycle is complete.

F. Monitoring Requirements

The secondary chamber or afterburner temperature shall be continuously monitored and recorded. Sensors shall be installed, maintained, and operated such that the flames from the burners do not impinge upon the sensors. The secondary chamber temperature shall be measured at or beyond the chamber exit. The temperature sensing device shall have an accuracy that is $\pm 25^{\circ}\text{F}$ over its operating range. The records must have a minimum chart speed of one (1) inch per hour for strip chart recorders and a maximum of 24 hours per chart for circular recorders.

G. Testing Requirements

1. For incinerators in existence before November 6, 1988, a particulate matter stack test shall be conducted within 180 days of November 6, 1988. For owners or operators with an approved compliance schedule, stack testing will be conducted as specified in the approved schedule.
2. For incinerators where construction commenced on or after November 6, 1988, stack testing for particulate matter must be conducted within 60 days after achieving the maximum capacity at which the incinerator will be operated, but no later than 180 days after initial startup.
3. In lieu of requiring a source to stack test, the Director may approve a previously conducted stack testing report for an identical unit tested under operating conditions representative of worst case emission release.
4. The owner or operator must furnish the Director with a written report of the results of any stack testing.
5. Stack testing for particulate matter shall be conducted in the manner prescribed by the director.
6. Stack testing for hydrogen chloride may be required by the Director. The stack testing shall be conducted in a manner prescribed by the Director.
7. Performance tests shall be conducted under such conditions as the Director shall specify to the facility operator based upon representative performance of the affected facility. The owner or operator shall make available to the Director such records as may be necessary to determine the conditions of the performance test(s). Operations during startups, shutdowns, and malfunctions shall not constitute representative conditions of performance tests.
8. The owner or operator shall provide the Director twenty (20) days notice of the performance test to afford the Director the opportunity to have observers present.
9. The owner or operator of an affected facility shall provide, or cause to be provided, performance testing facilities as prescribed by the Director.
10. The Director may require air contaminant stack testing as determined to be necessary to assure continuous compliance with the standards of this section and any emission limit stipulated as a permit condition.

H. Recordkeeping and Reporting Requirements

1. Records shall be maintained at the source for a minimum of two years from the date compiled and shall be made available for review upon request of the Director or his agent.
2. Operating procedures, startup procedures, and shutdown procedures for infectious waste incinerators shall be approved by the Director and posted on-site at or near the incinerator.

I. Inspection and Maintenance

1. Inspection and maintenance schedules for infectious waste incinerators are to be posted or kept on-site at or near the incinerator.
2. Records shall be kept of inspections, maintenance, and repairs.

20.3 Standards for Existing Hospital/Medical/Infectious Waste Incinerators.

A. Applicability

1. Except as provided by subparagraphs 2 through 8 of this paragraph, the designated or affected facility to which Section 20.3 applies is each individual hospital/medical/infectious waste incinerator (HMIWI) for which construction was commenced on or before June 20, 1996.
2. A combustor is not subject to Section 20.3 of these regulations during periods when only pathological waste, low-level radioactive waste, and/or chemotherapeutic waste is burned, provided the owner or operator of the combustor:
 - A. Notifies the Knox County Department of Air Quality Management of an exemption claim;
 - B. Keeps records on a calendar quarter basis of the periods of time when only pathological waste, low-level radioactive waste, and/or chemotherapeutic waste is burned.
3. Any co-fired combustor, as defined in paragraph b of Section 20.3, is not subject to Section 20.3 of these regulations if the owner or operator of the facility:
 - A. Notifies the Knox County Department of Air Quality Management of an exemption claim;

- B. Provides an estimate of the relative weight of hospital medical/infectious waste, and other fuel and/or wastes combusted; and
 - C. Keeps records on a calendar quarter basis of the weight of hospital waste, medical/infectious waste combusted, and the weight of all other fuels and wastes combusted at the combustor.
4. Any combustor required to have a permit under section 3005 of the Solid Waste Disposal Act is not subject to Section 20.3 of these regulations.
 5. Any combustor which meets the applicability requirements in standard or guidelines for certain municipal waste combustors under Subpart Cb, Ea, or Eb of 40 CFR 60 is not subject to Section 20.3 of these regulations.
 6. A pyrolysis unit is not subject to Section 20.3 of these regulations.
 7. Cement kilns firing hospital waste and/or medical/infectious waste are not subject to Section 20.3 of these regulations.
 8. Physical or operational changes made to an existing HMIWI unit solely for the purpose of complying with Section 20.3 of these regulations are not considered a modification and do not result in an existing HMIWI becoming subject to the new source performance standards under Section 46.0 of these regulation or Subpart Ec of 40 CFR 60.
 9. The owner or operator of an affected facility shall submit a completed Title V permit application no later than September 15, 2000. Each facility subject to Section 20.3 of these regulations shall have a Title V operating permit no later than September 15, 2002. Failure to meet either of these requirements will required a cessation of operation at that facility until the requirement is met.
 10. When a conflict arises from the affected facility being subject to more than one section of these regulations, the strictest portions of all appropriate regulations shall apply.
- B. For the purpose of the requirements of Section 20.3 of these regulations, the following definitions apply:
1. “Administrator” or “EPA” shall mean the Administrator of the United States Environmental Protection Agency or his/her authorized representative, the Director of the Knox County Department of Air Quality Management.
 2. “Batch HMIWI” shall mean an HMIWI that is designed such that neither waste charging nor ash removal can occur during combustion.

3. "Biologicals" shall mean preparations made from living organisms and their products, including vaccines, cultures, etc., intended for use in diagnosing, immunizing, or treating humans or animals or in research pertaining thereto.
4. "Blood Products" shall mean any product derived from human blood, including but not limited to blood plasma, platelets, red or white blood corpuscles, and other derived licensed products, such as interferon, etc.
5. "Body fluids" shall mean liquid emanating or derived from humans and limited to blood; dialysate; amniotic, cerebrospinal, synovial, pleural and percardial fluids; and semen and vaginal secretions.
6. "Bypass stack" shall mean a device used for discharging combustion gases to avoid severe damage to the air pollution control device or other equipment.
7. "Chemotherapeutic waste" shall mean waste material resulting from the production of use of antineoplastic agents used for the purpose of stopping or reversing the growth of malignant cells.
8. "Co-fired combustor" shall mean a unit combusting hospital waste and/or medical/infectious waste with other fuels or wastes (e.g., Coal, municipal solid waste) and subject to an enforceable requirement limiting the unit to combusting a fuel feed stream, 10 percent or less of the weight of which is comprised, in aggregate, of hospital waste and/or medical/infectious waste as measured on a calendar quarter basis. For the purpose of this definition, pathological waste, low-level radioactive waste and chemotherapeutic wastes are considered "other" wastes when calculating the percentage of hospital and medical/infectious waste combusted.
9. "Continuous emission monitoring system or CEMS" shall mean a monitoring system for continuously measuring and recording the emissions of a pollutant from the affected facility.
10. "Continuous HMIWI" shall mean an HMIWI that is designed to allow waste charging and ash removal during combustion.
11. "Dioxins/furans" shall mean the combined emissions of tetra through octachlorinated dibenzo-para-dioxins and dibenzofurans, as measured by EPA Reference Method 23.
12. "Dry scrubber" shall mean an add-on air pollution control system that injects dry alkaline sorbent (dry injection) or sprays an alkaline sorbent (spray dryer) to react with and neutralize acid gases in the HMIWI exhaust stream forming a dry powder material.

13. "Fabric filter or baghouse" shall mean an add-on air pollution control system that removes particulate matter (PM) and nonvaporous metal emissions by passing flue gas through filter bags.
14. "Facilities Manager" shall mean the individual in charge of purchasing, maintaining, and operating the HMIWI or the owner's or operator's representative responsible for the management of the HMIWI. Alternative titles may include Director of Facilities or Vice President of Support Services.
15. "High-air phase" shall mean the stage of the batch operating cycle when the primary chamber reaches and maintains maximum operating temperatures.
16. "Hospital" shall mean any facility which has an organized medical staff, maintains at least six inpatient beds, and where the primary function of the institution is to provide diagnostic and therapeutic patient services and continuous nursing care primarily to human inpatients who are not related and who stay on average in excess of 24 hours per admission. This definition does not include facilities maintained for the sole purpose of providing nursing or convalescent care to human patients who generally are not acutely ill but who required continuing medical supervision.
17. "Hospital/medical/infectious waste incinerator operator or HMIWI operator" shall mean any persons who operates, controls or supervises the day-to-day operation of an HMIWI.
18. "Hospital/medical/infectious waste incinerator or HMIWI or HMIWI unit" shall mean any device that combusts any amount of hospital waste and/or medical/infectious waste.
19. "Hospital waste" shall mean discards generated at a hospital, except unused items returned to the manufacturer. The definition of hospital waste does not include human corpses, remains and anatomical parts that are intended for interment or cremation.
20. "Infectious agent" shall mean any organism (such as virus or bacteria) that is capable of being communicated by invasion and multiplication in body tissues and capable of causing disease or adverse health impacts in humans.
21. "Intermittent HMIWI" shall mean an HMIWI that is designated to allow waste charging, but not ash removal, during combustion.
22. "Large HMIWI" shall mean:
 - A. An HMIWI whose maximum design waste burning capacity is more than 500 pounds per hour; or

- B. A continuous or intermittent HMIWI whose maximum charge rate is more than 500 pounds per hour; or
 - C. A batch HMIWI whose maximum charge rate is more than 4,000 pounds per day.
23. “Low-level radioactive waste” shall mean waste material which contains radioactive nuclides emitting primarily beta or gamma radiation, or both, in concentrations or quantities that exceed applicable Federal and State standards for unrestricted release. Low-level radioactive waste, spent nuclear fuel or by-product material as defined by the Atomic Energy Act of 1954 [42 U.S.C. 2014 (e)(2)].
24. “Malfunction” shall mean any sudden, infrequent, and not reasonably preventable failure of air pollution control equipment, process equipment, or a process to operate in a normal or unusual manner. Failures that are caused, in part or in whole, by poor maintenance or careless operation are not malfunctions. During periods of malfunction the operator shall operate within established parameters as much as possible, and monitoring of all applicable operating parameters shall continue until all waste has been combusted or the malfunction ceases, which ever comes first.
25. “Maximum charge rate” shall mean:
- A. For continuous and intermittent HMIWI, 110 percent of the lowest 3-hour average charge rate measured during the most recent performance test demonstrating compliance with all applicable limits.
 - B. For batch HMIWI, 110 percent of the lowest daily charge rate measured during the most recent performance test demonstrating compliance with all applicable emission limits.
26. “Maximum design waste burning capacity” shall mean:
- A. For continuous and intermittent HMIWI,

$$C = PV \times (15,000 / 8,500)$$
 Where:
 C=HMIWI capacity, lbs/hr
 PV=Primary chamber volume, ft³
 15,000=Primary chamber heat release factor, Btu/ft³/hr

8,500=standard waste heating value, Btu/lb

B. For batch HMIWI:

$$C = PV \times (4.5/8)$$

Where:

C=HMIWI capacity, lbs/hr

PV=Primary chamber volume, ft³

4.5=waste density, lbs/ft³

8=typical hours of operation of a batch HMIWI, hours.

27. “Maximum fabric filter inlet temperature” shall mean 110 percent of the lowest 3-hour average temperature at the inlet to the fabric filter (taken at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the dioxin/furan limit.

28. “Maximum flue gas temperature” shall mean 110 percent of the lowest 3-hour average temperature at the outlet from the wet scrubber (taken at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the mercury (hg) emission limit.

29. “Medical/infectious waste” shall mean any waste generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in the production or testing of biologicals that are listed in subparagraphs (a) through (g) of this definition. The definition of medical/infectious waste does not include ash from the incineration of medical/infectious waste, once the incineration process has been completed; human corpses, remains, and anatomical parts that are intended for interment or cremation; and domestic sewage materials (as defined in 40 CFR 261.4 (a)(1)), hazardous waste (as listed and defined in 40 CFR 261), and household waste identified (as defined in 40 CFR 261.4 (b)(1)).

A. Cultures and stocks of infectious agents and associated biologicals, including: cultures from medical and pathological laboratories; cultures and stocks of infectious agents from research and industrial laboratories;

wastes from the production of biologicals; discarded live and attenuated vaccines; and culture dishes and devices used to transfer, inoculate, and mix cultures.

- B. Human pathological waste, including tissues, organs, body parts and body fluids that are removed during surgery or autopsy, or other medical procedures, and specimens of body fluids and their containers.
- C. Human blood and blood products including:
 - I. Liquid waste human blood:
 - II. Products of blood;
 - III. Items saturated and/or dripping with human blood; or
 - IV. Items that were saturated and/or dripping with human blood that are now caked with dried human blood; including serum, plasma, other blood components, and their containers, which were used or intended for use in either patient care, testing and laboratory analysis, or the development of pharmaceuticals. Intravenous bags are included in this category.
- D. Sharps that have been used in animal or human patient care or treatment or in medical research, or industrial laboratories, including hypodermic needles, syringes (with or without the attached needle), Pasteur pipettes, scalpel blades, blood vials, needles with attached tubing, and culture dishes (regardless of presence of infectious agents). Also included are other types of broken or unbroken glassware that were in contact with infectious agents, such as used slides or cover slips.
- E. Animal waste including contaminated animal carcasses, body parts, and bedding of animals that were known to have been exposed to infectious agents during research (including research in veterinary hospitals), production of biologicals or testing of pharmaceuticals.
- F. Isolation wastes including biological waste and discarded materials contaminated with blood, excretions, exudates, or secretions from humans who were isolated to protect others from certain highly communicable diseases, or isolated animals known to be infected with highly communicable diseases.
- G. Unused sharps including the following unused, discarded sharps: hypodermic needles, suture needles, syringes, and scalpel blades.

30. “Medium HMIWI” shall mean:
- A. An HMIWI whose maximum design waste burning capacity is more than 200 pounds per hour but less than or equal to 500 pounds per hour; or
 - B. A continuous or intermittent HMIWI whose maximum charge rate is more than 200 pounds per hour but less than or equal to 500 pounds per hour; or
 - C. A batch HMIWI whose maximum charge rate is more than 1,600 pounds per day but less than or equal to 4,000 pounds per day.
31. “Maximum dioxin/furan sorbent flow rate” shall mean 90 percent of the highest 3-hour average dioxin/furan sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the dioxin/furan emission limit.
32. “Minimum Mercury (Hg) sorbent flow rate” shall mean 90 percent of the highest 3-hour average Hg sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the Hg emission limit.
33. “Minimum hydrogen chloride (HCl) sorbent flow rate” shall mean 90 percent of the highest 3-hour average HCl sorbent flow rate (taken, at a minimum, once every hour) measured during the most recent performance test demonstrating compliance with the HCl emission limit.
34. “Minimum horsepower or amperage” shall mean 90 percent of the highest 3-hour average horsepower or amperage to the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the applicable emission limits.
35. “Minimum pressure drop across the wet scrubber” shall mean 90 percent of the highest 3-hour average pressure drop across the wet scrubber PM control device (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the PM emission limit.
36. “Minimum scrubber liquor flow rate” shall mean 90 percent of the highest 3-hour average liquor pH at the inlet to the wet scrubber (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with all applicable emission limits.
37. “Minimum scrubber liquor pH” shall mean 90 percent of the highest 3-hour average liquor pH at the inlet to the wet scrubber (taken, at a minimum, once

every minute) measured during the most recent performance test demonstrating compliance with the HCl emission limit.

38. “Minimum secondary chamber temperature” shall mean 90 percent of the highest average secondary chamber temperature (taken, at a minimum, once every minute) measured during the most recent performance test demonstrating compliance with the PM, CO, or dioxin/furan emission limits.
39. “Modification or modified HMIWI” shall mean any change to an HMIWI unit after March 16, 1998, such that:
 - A. The cumulative cost of the modifications, over the life of the unit, exceed 50 percent of the original cost of the construction and installation of the unit (not including the cost of any land purchased in connection with such construction or installation) updated to current costs, or
 - B. The change involves a physical change in or change in the method of operation of the unit which increases the amount of any air pollutant emitted by the unit for which standards have been established under Section 129 or Section 111 of the Federal Clean Air Act.
40. “Operating day” shall mean a 24-hour period between 12:00 (midnight) and the following midnight during which any amount of hospital waste and/or medical/infectious waste is combusted at any time in the HMIWI.
41. “Operation” shall mean the period during which the waste is combusted in the incinerator excluding periods of startup or shutdown.
42. “Particulate Matter or PM” shall mean the total particulate matter emitted from an HMIWI as measured by EPA Reference Method 5 or EPA Reference Method 29.
43. “Pathological waste” shall mean waste material consisting of only human or animal remains, anatomical parts, and/or tissue, the bags/containers used to collect and transport the waste material, and animal bedding (if applicable).
44. “Primary chamber” shall mean the chamber in an HMIWI that receives waste material, in which the waste is ignited, and from which the ash is removed.
45. “Pyrolysis” shall mean the endothermic gasification of hospital waste and/or medical/infectious waste using external energy.
46. “Secondary chamber” shall mean a component of the HMIWI that receives combustion gases from the primary chamber and in which the combustion process is completed.

47. “Shutdown” shall mean the period of time after all waste has been combusted in the primary chamber. For continuous HMIWI, shutdown shall commence no less than 2 hours after the last charge to the incinerator. For intermittent HMIWI, shutdown shall commence no less than 4 hours after the last charge to the incinerator. For batch HMIWI, shutdown shall commence no less than 5 hours after the high-air phase of combustion has been completed.
48. “Small HMIWI” shall mean:
- A. An HMIWI whose maximum design waste burning capacity is less than or equal to 200 pounds per hour; or
 - B. A continuous or intermittent HMIWI whose maximum charge rate is less than or equal to 200 pounds per hour; or
 - D. A batch HMIWI whose maximum charge rate is equal to or less than 1,600 pounds per day.
49. “Standard conditions” shall mean a temperature of 20 degrees Celsius and 101.3 kilopascals.
50. “Standard Metropolitan Statistical Area or SMSA” means any areas listed in the OMB Bulletin No. 93-17 entitled “Revised Statistical Definitions for Metropolitan Areas”. Knoxville is listed as a SMSA.
51. “Startup” shall mean the period of time between the activation of the system and the first charge to the unit. For batch HMIWI, startup shall mean the period of time between activation of the system and the ignition of the waste.
52. “Wet scrubber” shall mean an add-on air pollution control device that utilizes an alkaline scrubbing liquor to collect particulate matter (including nonvaporous metals and condensed organics) and/or to absorb and neutralize acid gases.

C. Emission limits.

- A. No owner or operator of an affected facility shall cause, suffer or allow to be discharged into the atmosphere, from that facility, any emissions in excess of the limits established in Table 20.2 of these regulations.
- B. No owner or operator of an affected facility shall cause, suffer, or allow to be discharged into the atmosphere, from the stack of the

affected facility, any gases that exhibit an opacity of greater than 10 percent (6-minute block average).

**Table 20.2
Knox County Emission Limits for existing small, medium and large HMIWI**

Pollutant	Units (7% oxygen, dry basis)	Emission Limits		
		Hmiwi size		
		Small	Medium	Large
Particulate Matter	Milligrams per dry standard cubic Meter (grains per dry standard cubic foot)	115 (1.05)	69 (0.03)	34 (0.015)
Carbon monoxide	Parts per million by volume	40	40	40
Dioxins/furans	Nanograms per dry standard cubic meter total dioxins/furans (grains per billion dry standard cubic feet) or nanograms per dry cubic meter TEQ (grains per billion dry standard cubic feet)	125 (55) Or 2.3 (1.0)	125 (55) Or 2.3 (1.0)	125 (55) Or 2.3 (1.0)
Hydrogen chloride	Parts per million by volume or percent reduction	100 or 93%	100 or 93%	100 or 93%
Sulfur dioxide	Parts per million by volume	55	55	55
Nitrogen oxides	Parts per million by volume	250	250	250
Lead	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	1.2 (0.52) or 70%	1.2 (0.52) or 70%	1.2 (0.52) or 70%
Cadmium	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	0.16 (0.07) or 65%	0.16 (0.07) or 65%	0.16 (0.07) or 65%
Mercury	Milligrams per dry standard cubic meter (grains per thousand dry standard cubic feet) or percent reduction	0.55 (0.24) or 85%	0.55 (0.24) or 85%	0.55 (0.24) or 85%

Operator Training and Qualification Requirements

1. Compliance with the requirements of this paragraph shall be attained no later than September 15, 2000.
2. No owner or operator of an affected facility shall allow the affected facility to operate at any time unless a fully trained and qualified HMIWI operator is accessible, either at the facility or available within 1 hour. The trained and qualified operator may operate the HMIWI directly or be the direct supervisor of one or more HMIWI operators.

3. Operator training and qualifications shall be attained through a state-approved program that meets the following requirements included in subparagraphs 4 through 7 of this paragraph.
4. Training shall be obtained by completing an HMIWI operator training course that includes, at a minimum, the following provisions:
 - A. 24 hours of training on the following subjects:
 1. Environmental concerns, including pathogen destruction and types of emissions;
 2. Basic combustion principles, including products of combustion;
 3. Operation of the type of incinerator to be used by the operator, including proper startup, waste charging, and shutdown procedures;
 4. Combustion controls and monitoring;
 5. Operation of air pollution control equipment and factors affecting performance (if applicable);
 6. Methods to monitor pollutants (continuous emissions monitoring systems and monitoring of HMIWI and air pollution control device operating parameters) and equipment calibration procedures (where applicable);
 7. Inspection and maintenance of the HMIWI, air pollution control devices, and continuous emissions monitoring systems;
 8. Actions to correct malfunctions or conditions that may lead to malfunctions;
 9. Bottom and fly ash characteristics and handling procedures;
 10. Applicable Federal, State and Local regulations;
 11. Work safety procedures;

12. Pre-startup inspections and record keeping requirements.
 - A. An examination designed and administered by the instructor.
 - B. Reference material distributed to the attendees covering the course topics.
5. Qualification shall be obtained by:
 - A. Completion of a training course that satisfies the criteria under subparagraph 4 of this paragraph; and
 - B. Either 6 months experience as an HMIWI operator, 6 months experience as a direct supervisor of an HMIWI operator, or completion of at least two burn cycles under the observation of two qualified operators.
6. Qualification is valid from the date on which the examination is passed or completion of the required experience whichever is later.
7. To maintain qualification, the trained and qualified HMIWI operator shall complete and pass an annual review or refresher course of at least 4 hours covering, at a minimum, the following:
 - A. Updates of regulations;
 - B. Incinerator operation, including startup and shutdown procedures;
 - C. Inspection and maintenance;
 - D. Response to malfunctions or conditions that may lead to malfunction; and
 - E. Discussion of operating problems encountered by attendees.
8. A lapsed qualification shall be renewed by one of the following methods:
 - A. For a lapse of less than 3 years, the HMIWI operator shall complete and pass a standard annual refresher course described in subparagraph 7 of this paragraph above.
 - B. For a lapse of 3 years or more, the HMIWI operator shall complete and pass a training course with the minimum criteria described in subparagraph 7 of this paragraph above.

9. The owner or operator of an affected facility shall maintain documentation at the facility that addresses the following:
 - A. Summary of the applicable standards under Section 20.3 of these regulations;
 - B. Description of basic combustion theory applicable to an HMIWI;
 - C. Procedures for receiving, handling and charging waste;
 - D. HMIWI startup, shutdown, and malfunction procedures;
 - E. Procedures for maintaining proper combustion air supply levels;
 - F. Procedures for operating the HMIWI and associated air pollution control systems within the standards established under Section 20.3 of these regulations.
 - G. Procedures for responding to periodic malfunction or conditions that may lead to malfunction;
 - H. Procedures for monitoring HMIWI emissions;
 - I. Reporting and record keeping HMIWI emissions;
 - J. Procedures for handling ash.
10. The owner or operator of an affected facility shall establish a program for reviewing the information listed in subparagraph 9 of this paragraph annually with each HMIWI operator.
 - A. The initial review of the information listed in subparagraph 9 of this paragraph shall be conducted by March 15, 2000, or prior to assumption of responsibilities affecting HMIWI operation whichever date is later.
 - B. Subsequent reviews of the information listed in subparagraph 9 of this paragraph shall be conducted annually.
11. The information listed in subparagraph 9 of this paragraph shall be kept in a readily accessible location for all employees of the HMIWI. This information, along with training records shall be immediately available on request for inspection.

E. Waste Management Guidelines

The owner or operator of an affected facility shall prepare a waste management plan. The waste management plan shall identify both the feasibility and the approach to separate certain components of solid waste from the health care waste stream in order to reduce the amount of toxic emissions from incinerated waste. A waste management plan may include, but is not limited to, elements such as paper, cardboard, plastics, glass, battery, or metal recycling; or purchased recycled or recyclable products. A waste management plan may include different goals or approaches for different areas or departments of the facility and need not include new waste management goals for every waste stream. It should identify, where possible, reasonably available additional waste management measures, taking into account the effectiveness of waste management measures already in place, the costs of additional measures, the emissions reduction expected to be achieved, and any other environmental or energy impacts they might have. The American Hospital Association publication entitled “An Ounce of Prevention: Waste Reduction Strategies for Health Care Facilities” shall be considered in the development of the waste management plan.

F. Compliance and Performance Testing

1. The emission limits under paragraph C of Section 20.3 of these regulations shall apply at all times except during periods of startup, shutdown or malfunction, provided that no hospital waste or medical/infectious waste is charged to the affected facility during startup, shutdown or malfunction.
2. The owner or operator of an affected facility shall conduct an initial performance test in accordance with the performance test requirements contained in 40 CFR 60.8 to determine compliance with the emission limits using the procedures and test methods listed as follows in subparagraphs a. through k. The use of the bypass stack during a performance test shall invalidate the performance test.
 - A. All performance tests shall consist of a minimum of three test runs conducted under representative operating conditions.
 - B. The minimum sample time shall be 1 hour per test unless otherwise indicated.
 - C. EPA Reference Method 1 of Appendix A of 40 CFR 60 shall be used to select the sampling location and number traverse points.
 - D. EPA Reference Method 3 or 3A of Appendix A of 40 CFR 60 shall be used for gas composition analysis, including measurement of oxygen concentration. EPA Reference Method 3 or 3A of Appendix A of 40 CFR 60 shall be used simultaneously with each method.
 - E. The pollutant concentration shall be adjusted to 7 percent oxygen using the following equation:

$$C_{adj} = C_{meas} \left[\frac{20.9 - 7}{20.9 - \%O_2} \right]$$

Where:

C_{adj} = pollutant concentration adjusted to 7% oxygen;

C_{meas} = pollutant concentration measured on a dry basis;

$(20.9 - 7)$ = 20.9 percent oxygen - 7% oxygen (defined oxygen correction basis);

20.9 = oxygen concentration in air, percent;

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

- F. EPA Reference Method 5 or 29 of Appendix A of 40 CFR 60 shall be used to measure the particulate matter.
- G. EPA Reference Method 9 of Appendix A of 40 CFR 60 shall be used to measure the CO emissions.
- H. EPA Reference Method 10 or 10B of Appendix A of 40 CFR 60 shall be used to measure total dioxin/furan emissions. The minimum sample time shall be 4 hours per test run. If the affected facility has selected the toxic equivalency standards for dioxin/furan, under paragraph C of Section 20.3 of these regulations, the following procedures shall be used to determine compliance:
 - 1. Measure the concentration of each dioxin/furan tetra-through octa-congener emitted using EPA Reference Method 23.
 - 2. For each dioxin/furan congener measured in accordance with subparagraph (2)(I)(1) of this paragraph, multiply the congener concentration by its corresponding toxic equivalency factor specified in Table 20.3 of Section 20.3 of these regulations.
 - 3. Sum the products calculated in accordance with subparagraph (2)(I)(2) of this paragraph to obtain the total concentration of dioxin/furans emitted in terms of toxic equivalency.
- I. EPA Reference Method 26 of Appendix A of 40 CFR 60 shall be used to measure HCl emissions. If the affected facility has selected the percentage reduction standards for HCl under paragraph C of Section

20.3 of these regulations, the percentage reduction in HCl emissions ($\% R_{\text{HCl}}$) is computed using the following equation:

$$(\%R_{\text{HCl}}) = [(E_I - E_o)/E_I] \times 100$$

Where:

E_I = HCl emission concentration measured at the control device inlet, corrected to 7% oxygen (dry basis); and

E_o = HCl emission concentration measured at the control device outlet, corrected to 7% oxygen (dry basis).

Table 20.3 toxic equivalency factors

Dioxin/Furan Congener	Toxic Equivalency Factor
2,3,7,8-tetrachlorinated dibenzo-p-dioxin	1.0
1,2,3,7,8-pentachlorinated dibenzo-p-dioxin	0.5
1,2,3,4,7,8-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,7,8,9-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,6,7,8-hexachlorinated dibenzo-p-dioxin	0.1
1,2,3,4,6,7,8-heptachlorinated dibenzo-p-dioxin	0.01
Octachlorinated dibenzo-p-dioxin	0.001
2,3,7,8-tetrachlorinated dibenzofuran	0.1
2,3,4,7,8-pentachlorinated dibenzofuran	0.5
1,2,3,7,8-pentachlorinated dibenzofuran	0.05
1,2,3,4,7,8-hexachlorinated dibenzofuran	0.1
1,2,3,6,7,8-hexachlorinated dibenzofuran	0.1
1,2,3,7,8,9-hexachlorinated dibenzofuran	0.1
2,3,4,6,7,8-hexachlorinated dibenzofuran	0.1
1,2,3,4,6,7,8-heptachlorinated dibenzofuran	0.01
1,2,3,4,7,8,9-heptachlorinated dibenzofuran	0.01
Octachlorinated dibenzofuran	0.001

- J. EPA Reference Method 29 or Appendix A of 40 CFR 60 shall be used to measure Pb, Cd, and Hg emission. If the affected facility has selected the percentage reduction standards for metals under paragraph C of Section 20.3 of these regulations, the percentage reduction in emissions ($\%R_{\text{metal}}$) is computed using the following equation:

$$(\%R_{\text{metal}}) = [(E_I - E_o)/E_I] \times 100$$

Where:

E_I = metal emission concentration (Pb, Cd, or Hg) measured at the control device inlet, corrected to 7% oxygen (dry basis); and

E_o = metal emission concentration (Pb, Cd, or Hg) measured at the control device outlet, corrected to 7% oxygen (dry basis).

3. Following the date on which the initial performance test is completed or is required to be completed under the performance test requirements contained in 40 CFR 60.8, whichever date comes first, the owner or operator shall:
- A. Determine compliance with the opacity limit by conducting an annual performance test (no more than 12 months following the previous

performance test) using the applicable procedures and test methods listed in subparagraph 2 of this paragraph.

- B. Determine the compliance with the PM, CO and HCl emission limits by conducting an annual performance test (no more than 12 months following the previous performance test) using the applicable procedures and test methods listed in subparagraph 2 of this paragraph. If all three performances over a three-year period indicate compliance with the emission limit for a pollutant (PM, CO, or HCl), the owner or operator may forego a performance test for that pollutant for the subsequent 2 years. At a minimum, a performance test for PM, CO, and HCl shall be conducted every third year (no more than 36 months following the previous performance test). If a performance test every third year indicates compliance with the emission limits for a pollutant (PM, CO, or HCl), the owner or operator may forego performance tests for that pollutant for up to an additional two years. If any performance test indicates noncompliance with the respective emission limit, a performance test for that pollutant shall be conducted annually until all annual performance tests over a 3-year period indicate compliance with the emission limit. The use of the bypass stack during a performance test shall invalidate the performance test. Notification of any intended performance test must be given to the Department of Air Quality Management not later than two weeks prior to conducting a performance test.
 - C. Facilities using a CEMS to demonstrate compliance with any emission limits under paragraph C of Section 20.3 of these regulations shall:
 - 1. Determine compliance with the appropriate limit(s) using a 12 hour rolling average, calculated each hour as the average of the previous 12 operating hours (not including startup, shutdown or malfunction).
 - 2. Operate all CEMS in accordance with the applicable procedures under appendices B and F of 40 Cfr 60.
 - D. The Director of the Department of Air Quality Management may require the facility to conduct additional performance tests be conducted, at his/her discretion, in order to confirm compliance with the emission limits established in paragraph C of Section 20.3 of these regulations.
4. The owner or operator of an affected facility equipped with a dry scrubber followed by a fabric filter and/or a wet scrubber shall:

- A. Establish the appropriate maximum and minimum operating parameters, indicated in Table 20.4 of Section 20.3 of these regulations for each control system, as site specific operating parameters during the initial performance test to determine compliance with the emission limits; and
 - B. Following the date on which the initial performance test is completed or is required to be completed under the performance test requirements contained in 40 CFR 60.8, whichever date comes first, ensure that the affected facility does not operate above any of the applicable maximum operating parameters or below any of the applicable minimum operating parameters listed in Table 20.4 of Section 20.3 of these regulations and measured as 3-hour rolling averages (calculated each hour as the average of the previous 3 operating hours) at all times except during startup, shutdown or malfunction. Operating parameter limits do not apply during performance tests. Operation above the established maximum or below the established minimum operating parameters shall constitute a violation of the established operating parameters.
5. Except as provided in subparagraph 8 of this paragraph, for affected facilities equipped with a dry scrubber followed by a fabric filter:
- A. Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.
 - B. Operation of the affected facility above the maximum fabric filter inlet temperature, above the maximum charge rate and below the minimum dioxin/furan sorbent flow rate (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the dioxin/furan emission limit.
 - C. Operation of the affected facility above the maximum charge rate and below the minimum HCl sorbent flow rate (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the HCl emission limits.
 - D. Operation of an affected facility above the maximum charge rate and below the minimum Hg sorbent flow rate (measured on a 3-hour rolling average) shall constitute a violation of the Hg emission limit.

- E. Use of the bypass stack (except during startup, shutdown or malfunction) shall constitute a violation of the PM, dioxin/furan, HCl, Pb, Cd, and Hg emission limits.
6. Except as provided in subparagraph 8 of this paragraph, for affected facilities equipped with a wet scrubber:
- A. Operation of the affected facility above the maximum charge rate and below the minimum pressure drop across the wet scrubber or below the minimum horsepower or amperage to the system (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the PM emission limit.
 - B. Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.
 - C. Operation of the affected facility above the maximum charge rate, below the minimum secondary chamber temperature, and below the minimum scrubber liquor flow rate (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the dioxin/furan emission limit.
 - D. Operation of the affected facility above the maximum charge rate and below the minimum scrubber liquor pH (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the HCl emission limit.
 - E. Operation of the affected facility above the maximum charge rate and above the maximum flue gas temperature (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the Hg emission limit.
 - F. Use of the bypass stack (except during startup, shutdown, or malfunction) shall constitute a violation of the PM, dioxin/furan, HCl, Pb, Cd, and Hg emission limits.
7. Except as provided in subparagraph 8 of this paragraph, for affected facilities equipped with a dry scrubber followed by a fabric filter and a wet scrubber:
- A. Operation of the affected facility above the maximum charge rate and below the minimum secondary chamber temperature (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the CO emission limit.

- B. Operation of the affected facility above the maximum charge rate, above the maximum fabric filter inlet temperature, and below the minimum dioxin/furan sorbent flow rate (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the dioxin/furan emission limit.
 - C. Operation of the affected facility above the maximum charge rate and below the minimum scrubber liquor pH (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the HCl emission limit.
 - D. Operation of the affected facility above the maximum charge rate and below the minimum Hg sorbent flow rate (each measured on a 3-hour rolling average) simultaneously shall constitute a violation of the Hg emission limit.
 - E. Use of the bypass stack (except during startup, shutdown, or malfunction) shall constitute a violation of the PM, dioxin/furan, HCl, Pb, Cd and Hg emission limits.
- 8. The owner or operator of an affected facility may conduct a repeat performance test within 30 days of violation of applicable operating parameter(s) to demonstrate that the affected facility is not in violation of the applicable emission limit(s). Repeat performance tests conducted pursuant to this paragraph shall be conducted using the identical operating parameters that indicated violation under subparagraph 5, 6, or 7 of this paragraph.
 - 9. The owner or operator of an affected facility using an air pollution control device other than a dry scrubber followed by a fabric filter, and/or wet scrubber to comply with the emission limits under paragraph C of Section 20.3 of these regulations shall petition the Administrator for other site specific operating parameters to be established during the initial performance test and continuously monitored thereafter. The owner or operator shall not conduct the initial performance test until after the petition has been approved by the Administrator.
 - 10. The owner or operator of an affected facility may conduct a repeat performance test at any time to establish new values for the operating parameters. The Knox County Department of Air Quality Management may request a performance test at any time.

G. Monitoring:

1. The owner or operator of an affected facility shall install, calibrate (to manufacturers' specifications), maintain, and operate devices (or established methods) for monitoring the applicable maximum and minimum operating parameters listed in Table 20.4 of Section 20.3 of these regulations such that these devices (or methods) measure and record values for these operating parameters at the frequency indicated in Table 20.4 of Section 20.3 of these regulations at all times except during periods of startup and shutdown.
2. The owner or operator of an affected facility shall install, calibrate (to manufacturers' specifications), maintain and operate devices or methods for measuring the use of the bypass stack including date, time and duration.
3. The owner or operator of an affected facility using something other than a dry scrubber followed by a fabric filter and/or wet scrubber to comply with the emission limits under paragraph C of Section 20.3 of these regulations shall install, calibrate (to manufacturers' specifications), maintain, and operate the equipment necessary to monitor the operating parameters developed pursuant to Section 20.3 of these regulations.
4. The owner or operator of an affected facility shall obtain monitoring data at all times during HMIWI operation except during periods of monitoring equipment malfunction, calibration, or repair. At a minimum, valid monitoring data shall be obtained for 75 percent of the operating hours per day and for 90 percent of the operating hours per calendar quarter that the affected facility is combusting hospital waste and/or medical/infectious waste.

Table 20.4 Operating Parameters to be Monitored and Minimum Measurement and Recording Frequencies

Operating Parameters To be Monitored	Minimum Frequency		Control System		
	Data Measurement	Data Recording	Dry Scrubber Followed By Fabric Filter	Wet Scrubber	Dry Scrubber Followed by Fabric Filter and Wet Scrubber
Maximum charge rate	Continuous	1 x hour	Required	Required	Required
Maximum fabric filter inlet temperature	Continuous	1 x minute	Required		Required
Minimum Secondary Chamber Temperature	Continuous	1 x minute	Required	Required	Required
Minimum dioxin/furan sorbent flow rate	Hourly	1 x hour	Required		Required
Minimum HCl sorbent flow rate	Hourly	1 x hour	Required		Required
Minimum Mercury (Hg) sorbent flow rate	Hourly	1 x hour	Required		Required
Minimum pressure drop across the wet scrubber or minimum horsepower or amperage to wet scrubber	Continuous	1 x minute		Required	Required
Minimum scrubber liquor flow rate	Continuous	1 x minute		Required	Required
Minimum scrubber liquor pH	Continuous	1 x minute		Required	Required

H. Reporting and record keeping requirements

1. The owner or operator of an affected facility shall maintain the following information for a period not less than 5 years:
 - A. Calendar date of each record;
 - B. Records of the following data:
 1. Concentrations of any pollutant listed in paragraph C of Section 20.3 of these regulations and/or measurements of opacity as determined by continuous emission monitoring system (is applicable).
 2. Results of fugitive emissions (by EPA Reference Method 22) tests, if applicable;
 3. HMIWI charge dates, times, weights and hourly charge rates;
 4. Fabric filter inlet temperatures during each minute of operation, as applicable;
 5. Amount and type of dioxin/furan sorbent used during each hour of operation; as applicable;
 6. Amount and type of Hg sorbent used during each hour of operation, as applicable;
 7. Amount and type of HCl sorbent used during each hour of operation, as applicable;
 8. Secondary chamber temperature during each minute of operation;
 9. Liquor flow rate to the wet scrubber during each minute of operation, as applicable;
 10. Horsepower or amperage to wet scrubber during each minute of operation, as applicable;
 11. Pressure drop across the wet scrubber system during each minute of operation, as applicable;
 12. Temperature at the outlet from the wet scrubber during each minute of operation, as applicable;

13. pH at the inlet to the wet scrubber during each minute of operation, as applicable;
 14. Records indicating use of the bypass stack, including dates, times and duration; and
 15. For affected facilities complying with subparagraphs F (9) and G (3) of Section 20.3 of these regulations, the owner or operator shall maintain all operating parameter data collected.
- C. Identification of calendar days for which the data on emission rates or operating parameters specified under subparagraph (1)(b) of this paragraph have not been obtained, with an identification of the emission rates or operating parameters not measured, reasons for not obtaining the data, and a description of corrective actions taken.
 - D. Identification of calendar days, times and durations of malfunctions, a description of the malfunction and the corrective action taken.
 - E. Identification of calendar days for which data on emission rates or operating parameters specified under subparagraph (1)(b) of this paragraph exceeded the applicable limits, with a description of the exceedances, reason for such exceedances, and description of corrective actions taken.
 - F. The results of the initial, annual, and any subsequent performance tests conducted to determine compliance with the emission limits and/or to establish operating parameters, as applicable.
 - G. Records showing the names of HMIWI operators who have completed review of the information in subparagraph D (9) as required by subparagraph D (10) of Section 20.3 of these regulations, including the date of initial review and all subsequent annual review.
 - H. Records showing the names of the HMIWI operators who have completed the operator training requirements, including documentation of training and the dates of training.
 - I. Records showing the names of HMIWI operators who have met the criteria for qualification under paragraph D of Section 20.3 of these regulations and the dates of their qualifications.

- J. Records of calibration of any monitoring devices as required under subparagraph G (1), G (2), and G (3) in Section 20.3 of these regulations.
- 2. The owner or operator of an affected facility shall submit the information specified in subparagraphs (2)(a) through (2)(c) of this paragraph no later than 60 days following the initial performance test. All reports shall be signed by the facility manager.
 - A. The initial performance test data as recorded under subparagraph F (2)(a) through (2)(k) of Section 20.3 of these regulations, as applicable.
 - B. The values of site specific operating parameters established pursuant to subparagraph F(4) or F(9) of Section 20.3 of these regulations, as applicable.
 - C. The waste management plan as specified in paragraph E in Section 20.3 of these regulations.
- 3. An annual report shall be submitted 1 year following the submission of the information in subparagraph (2) of this paragraph and subsequent reports shall be submitted no more than 12 months following the previous report (once the unit is subject to permitting requirements under Title V of the Federal Clean Air Act, the owner or operator must submit these reports semiannually). The report shall include the information specified in subparagraphs (3)(a) through (h) of this paragraph. All reports shall be signed by the facilities manager.
 - A. The values for the site-specific operating parameters established pursuant to subparagraph F(4) or F(9) of Section 20.3 of these regulations, as applicable.
 - B. The highest maximum operating parameter and the lowest minimum operating parameter, as applicable, for each operating parameter recorded for the calendar year being reported pursuant to subparagraph F(4) or F(9), as applicable.
 - C. The highest maximum operating parameter and the lowest minimum operating parameter recorded pursuant to subparagraph F(4) or F(9) for the calendar year preceding the year being reported, in order to provide the Knox County Department of Air Quality Management with a summary of the performance of the affected facility over a 2-year period.

- D. Any information recorded under subparagraph (1)(c) through (1)(e) of this paragraph for the calendar year being reported.
 - E. Any information recorded under paragraphs (1)(c) through (1)(e) of this paragraph for the calendar year preceding the year being reported, in order to provide the Knox County Department of Air Quality Management with a summary of the performance of the affected facility over a 2 year period.
 - F. If a performance test was conducted during the reporting period, the results of that test.
 - G. If no exceedance or malfunctions were reported under subparagraph (1)(c) through 1(e) of this paragraph for the calendar year being reported, a statement that no exceedances occurred during the reporting period.
 - H. Any use of the bypass stack, the duration, the reason for malfunction, and corrective action taken.
- 4. The owner or operator of an affected facility shall submit semiannual reports containing any information recorded under subparagraph (1)(c) through (1)(e) of this paragraph no later than 60 days following the reporting period. The first semiannual reporting period ends 6 months following the submission of information in subparagraph (2) of this paragraph. Subsequent reports shall be submitted no later than 6 months following the previous report. All reports shall be signed by the facilities manager.
 - 5. All records specified under subparagraph (1) of this paragraph shall maintain onsite in either a paper copy or a computer-readable format, unless an alternate format is approved by the Knox County Department of Air Quality Management.
- I. Compliance schedules
 - 1. Except as provided in subparagraph (2), designated or affected facilities to which the provisions in Section 20.3 of these regulations applies (as defined in paragraph a) shall comply with all requirements of Section 20.3 of these regulations on or before September 15, 2000, regardless of whether the Department has identified a designated or affected facility in the State Plan, inventory required by Subpart B of 40 CFR 60, or not.
 - 2. For designated facilities planning to install the necessary air pollution control equipment, the Department may allow compliance on or before September 15, 2002, but as expeditiously as possible. No later than November 22, 1999,

these facilities shall petition the Knox County Department of Air Quality Management in writing, as outlined in subparagraphs (a) and (b), of this subparagraphs, below. Under no circumstances can compliance with the provisions in Section 20.3 of these regulations extend beyond September 15, 2002.

- A. Documentation of the analysis undertaken to support the need for an extension, including an explanation of why September 15, 2002, (or other closer proposed date) is sufficient time to comply while September 15, 2000, is not sufficient. The documentation shall also include an evaluation of the option to transport waste off-site to a commercial medical waste treatment and disposal facility on a temporary or permanent basis; and
- B. Documentation of measurable and enforceable incremental steps of progress to be taken towards compliance with the requirements in Section 20.3 of these regulations, as defined in subparagraph (1) through (10) below:
 - 1. Date for submitting a petition for site specific operating parameters under subparagraph F(9) in Section 20.3 of these regulations;
 - 2. Date for obtaining services of an architectural and engineering firm regarding the air pollution control device(s);
 - 3. Date for obtaining design drawings of the air pollution control device(s);
 - 4. Date for ordering the air pollution control device(s);
 - 5. Date for obtaining the major components of the air pollution control device(s);
 - 6. Date for initiation of site preparation for the installation of the air pollution control device(s);
 - 7. Date for initiation of installation of the air pollution control device(s);
 - 8. Date for initial startup of the air pollution control device(s);
 - 9. Date for initial compliance test(s) of the air pollution control device(s);

10. Date for final compliance.
3. Designated facilities planning to shutdown permanently to demonstrate compliance with subparagraph (1) of this paragraph shall notify the Knox County Department of Air Quality Management in writing, no later than November 22, 1999. The notification shall include documentation of measurable and enforceable incremental steps of progress to be taken toward compliance with the requirements in Section 20.3 of these regulations, as defined in subparagraph (a) through (f) of this subparagraph, below:
 - A. Date for designated facility plan for shutdown;
 - B. Date for contact with appropriate vendor (off-site hauler or alternative waste treatment equipment);
 - C. Date to begin construction of alternative waste treatment equipment (if applicable);
 - D. Date for complete installation of alternative waste treatment equipment (if applicable);
 - E. Date for shutdown of incinerator;
 - F. Date for dismantling or rendering inoperable the incinerator.
4. Department Actions on Petitions. On receipt of a petition, the Department will authorize one of the following actions, as it shall determine:
 - A. The petition may be dismissed if the Department determines that it is not adequate under subparagraph (2) of this paragraph;
 - B. The Department may grant the request of the petition, as petitioned or by imposing such conditions as the requirements in Section 20.3 of these regulations, including the establishment of schedules of compliance.
 - C. The Department may deny the petition. If such denial is made, the Department shall notify the petitioner in writing, state the reasons for denial and outline the procedures for appeal.
5. Termination procedures. Any petition granted by the Department may be terminated by the Department whenever the Department finds, after an opportunity for the petitioner to demonstrate compliance and after notice and an opportunity for administrative hearing, that the petitioner is in violation of any requirement, condition, schedule, limitation, or any other provision of the

petition or that operation under the petition does not meet the minimum requirements established by Local, State and/or Federal law and regulations or is unreasonably threatening public health.

6. Affected facilities planning to comply with Section 20.3 of these regulations by September 15, 2000, must notify the Knox County Department of Air Quality Management of their intent to do so by November 22, 1999. Failure to meet this requirement shall be considered a violation of these regulations.
7. Facilities who fail to submit a petition for the extended compliance time period by the required date shall be required to be in compliance with Section 20.3 of these regulations not later than September 15, 2000.