



ENVIRONMENTAL COUNCIL OF ZAMBIA



Minimum Specifications for Health Care Waste Incineration

The Specifications have been developed in accordance with the Environmental Protection and Pollution Control Act (Amendment) No. 12 of 1999, the Hazardous Waste Management Regulations Statutory Instrument No. 125 of 2001 and shall be implemented in accordance with the afore cited legislation.

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Acronyms and Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
DHB	District Health Board
ECZ	Environmental Council of Zambia
EPPCA	Environmental Protection and Pollution Control Act
HCW	Health Care Waste
HCWM	Health Care Waste Management
HCF	Health Care Facilities
HIV	Human Immunodeficiency Virus
IP	Infection Prevention
SI	Statutory Instrument
MoH	Ministry of Health
NISIR	National Institute of Scientific and Industrial Research
TDAU	Technological Development Advisory Unit
UNZA	University of Zambia
ZANARA	Zambia National Response to HIV/AIDS

Definition of Key Terms

Disposal	Intentional burial, deposit, discharge, dumping, placing or release of any waste material into or on air, land or water. Disposal is undertaken without the intention of retrieval.
Encapsulation	Abstraction/act of enclosing substance in a capsule so that the included object is not apparent. E.g. filling a sharps container that is three quarters full with cement or clay, this, after hardening, can be disposed of safely in a municipal landfill.
Healthcare waste	All waste generated by health care facilities, research facilities, laboratories and that produced during undertakings in the home e.g. dialysis, insulin injections and home based care
Incineration	Controlled burning of solid, liquid or gaseous combustible wastes to produce gases and residues containing little or no burnable material.
Infectious waste	The part of health care waste that is capable of causing infectious disease.
Microorganism	Causative agent of infection (include bacteria, viruses, fungi and parasites)
Municipal waste	General waste for collection by local authorities (district, municipal or city councils) generated mainly by households, commercial activities and street sweeping.
Opacity	State/quality of a body that render it impervious to the rays of light; want of transparency; opaqueness.
Receptacle/container	Vessel in which waste is placed for handling, transportation, storage and/or eventual disposal.
Residence Time	Period of time spent by a particle in a particular place.
Sanitary landfill	Engineered method of disposing of solid waste on land in a manner that protects the environment.
Scavenging	Manual sorting of solid waste at landfills and removal of usable material.
Segregation	Systematic separation of solid waste into designated categories.
Sharps	Hypodermic needles, suture needles, scalpel blades, scissors, wire sutures, broken glass or any object that can cause a puncture or cut.
Treatment	A process that changes the physical, chemical or biological character of waste to reduce its environmental threat. Treatment can neutralize waste, recover energy or material resources from waste, render the waste less hazardous or make the waste safe to transport, store or dispose of.
Waste Management	All activities, administrative and operational, involved in the handling, treatment, conditioning, storage, transportation and disposal of waste.

Foreword

Quantities of health care waste generated monthly range from a few kilograms at remote health care facilities, to hundreds or possibly thousands of kg at central hospitals. Poorly disposed off health care waste such as syringes and needles may be scavenged and reused resulting in people being infected with hepatitis Band C, HIV and other blood-borne infections. The need for adequate and safe disposal of health care waste cannot be thus over emphasised. To avoid these serious health problems and the lack of minimum specifications for health care waste incinerators, the Environmental Council of Zambia (ECZ) and Ministry of Health (MoH), with the support of partner stakeholders, embarked on the development of these specifications for use by all health care facilities in the country.

Countrywide surveys of incinerator use, maintenance and management have revealed widespread deficiencies in the construction, siting, operation and management of these units. These deficiencies can result in poor performance of the incinerator, e.g. low temperatures, incomplete waste destruction, inappropriate ash disposal, high smoke emissions, fugitive emissions, etc. Still, user acceptance of incinerators appears generally high and the use of incinerators is preferable to the disposal of waste in unsecured pits or landfills, or (uncontrolled) burning in drums or pits. However, the combustion of health care waste can form particulate matter, dioxins, furans and other toxic air pollutants.

It is with the foregoing that these minimum specifications have been developed to ensure a sound management of the incineration process, disposal of health care waste, minimizing emissions, and reducing occupational exposures and other hazards. This will entail adherence to the following key elements:

- (1) Effective waste reduction and waste segregation, ensuring that only the smallest quantity of appropriate waste types is incinerated.
- (2) An engineered design, ensuring that combustion conditions are appropriate, e.g., sufficient residence time and temperatures to minimize products of incomplete combustion.
- (3) Siting incinerators away from populated areas or where food is grown, thus minimizing exposures and risks.
- (4) Construction following detailed drawings, thus avoiding flaws that can lead to incomplete destruction of waste, higher emissions, and premature failures of the incinerator.
- (5) Proper operation, critical to achieving the desired combustion conditions and emissions, e.g., appropriate start-up and cool-down procedures; achievement and maintenance of a minimum temperature before waste is burned, use of appropriate loading/charging rates (both fuel and waste) to maintain appropriate temperatures, proper disposal of ash, and various actions and equipment to safeguard workers.
- (6) Periodic maintenance to replace or repair defective components, e.g., including inspection, spare parts inventory, record keeping, etc.
- (7) Enhanced training and management, possibly promoted by certification and inspection programs for operators, the availability of an operating and maintenance manual, management oversight, and maintenance programs.

Implementation of these minimum specifications and achieving the objectives will be reviewed at regular intervals, beginning with implementation process through workshops six months following adoption of these specifications.

These minimum specifications for health care waste incineration are intended to guide managers of health care facilities operators in the management of health care waste incineration. The development of these minimum specifications involved a participatory process that brought together ECZ, MoH and other stakeholders over an extended period.

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