AUSTRALIAN CAPITAL TERRITORY

CLINICAL WASTE ACT 1990

NUMBER 12 OF 1991

UNDER section 16(1) of the Clinical Waste Act 1990 I GIVE NOTICE of the preparation of the CLINICAL WASTE MANUAL.

Dated: 16th April, 1991

Craig John Duby
Minister for Finance and Urban Services

INFORMATION FOR MEMBERS OF THE PUBLIC

Under s 16(2) of the Clinical Waste Act 1990, the Clinical Waste Manual specifies it will come into effect on 1 July 1991.

Copies of the Manual will be available for public inspection at the office of the Controller of Clinical Waste, Department of Urban Services, First Floor, North Building, London Circuit, Canberra City. Copies of the Manual will be available for sale at this address at a cost of $5.00.

Clinical wastes are those wastes resulting from the treatment and care of people and animals or any other activity where puncturing of the skin occurs, and include such things as hypodermic needles, scalpels and pipettes (ie "sharps"), as well as tissue and fluid specimens, some drugs and materials that have been in contact with these sorts of substances. A complete interpretation of clinical waste is provided in the Clinical Waste Act and the Manual.

The Clinical Waste Manual contains information about requirements relating to the manner in which clinical waste may be stored, treated, transported and disposed of; the kinds of containers in which clinical waste may be stored or transported; the labelling and marking of containers used for the transport or storage of clinical waste; a list of disposal sites, and the form of an application for a licence to carry on the business of transporting clinical waste.

AUSTRALIAN CAPITAL TERRITORY

Clinical Waste Manual

June 1991

TO BE READ IN CONJUNCTION WITH
THE CLINICAL WASTE ACT 1990

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ISBN
0 642 16320 0

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CLINICAL WASTE MANUAL

1 INTRODUCTION

1.1 Purpose of the Clinical Waste Legislation

Clinical wastes are those wastes resulting from the treatment and care of people and animals, and include such things as hypodermic needles, scalpels, pipettes, (i.e. "sharps"), as well as tissue and fluid specimens, human, cytotoxic and veterinary drugs and pharmaceuticals (used or unused) and their wastes, and materials which have been in contact with these sorts of substances. The variety and volume of these types of wastes are increasing, creating new problems in storage, transport and disposal.

Clinical waste poses a risk to public health and the environment if disposed of by conventional garbage disposal methods. If these wastes enter the waste stream wrapped inside relatively fragile containers such as paper or household garbage bags, subsequent dumping at public tipping sites will leave them open to disturbance, with the risk of infection and needle stick injuries. The potential exists for mishap to occur in a variety of workplaces. This has led to industrial action and financial losses being incurred by commercial enterprises and government agencies which are dependent on waste management services.

In order to fully ascertain the nature and extent of the problem in Canberra, a consultant, Mr Malcolm Forsyth, was commissioned in mid-1988 to determine the amount and type of clinical waste being generated in the ACT and to define a management strategy to deal with it. The final report was circulated in November 1988 to concerned union organisations and departmental agencies, as well as to interested persons from the private sector.

The introduction of Clinical Waste legislation is consistent with initiatives taken in a number of Australian states for the controlled management of clinical wastes. The definitions, control measures for waste generators and the approach to disposal of these wastes take into account guidelines produced by the National Health and Medical Research Council.

Under the Clinical Waste Act 1990, procedures for the management of clinical wastes are laid down in this Manual, which was derived from the requirements of the Act and based on the findings and recommendations of the Forsyth report.

This Manual contains as a minimum requirement, procedures detailing the following:

(a) the manner of storage, treatment, transport and disposal of clinical wastes;
(b) containers to be used in storage and transport of clinical wastes;
(c) colour coding, labelling and marking of these containers;
(d) a list of appropriate disposal sites; and
(e) the layout of the application for a licence under the Act.

1.2 Responsibilities and Information Services

The professional resources required to administer the Act will be employed in the Waste Management Section, which has responsibility for clinical waste within the ACT Government Service. The Minister has appointed the Manager of the Waste Management Section as the Clinical Waste Controller, in accordance with Section 7 of the Act. The Clinical Waste Controller is responsible for:

(a) retention of the Clinical Waste Manual and amendments;
(b) actions in regard to licences to transport clinical waste;
(c) enforcement of the Act in regard to the actions of clinical waste inspectors; and
(d) preparation of the Annual Report on the operation of the Act.

Inspectors, appointed by the Minister, are responsible for:

(a) inspections of premises in accordance with the Act;
(b) inspections of clinical waste transporting vehicles and licensed clinical waste disposal facilities
(c) taking samples from premises and arranging the analysis of samples; and
(d) preparation of evidence for the institution of prosecution of offences under the Act and subsequent court attendances;

Owners or Directors of regulated premises are responsible for:

(a) ensuring that clinical wastes are safely handled within their premises;
(b) staff trained in the handling and packaging procedures contained in this Manual; and
(c) arrangements made with licensed clinical waste transporters for the timely collection of wastes.

Responsibilities of licensed clinical waste transporters are detailed in this Manual under Chapter 6 — Transportation.

If information is required regarding the handling, collection, disposal etc. of clinical wastes, the following services are available:

Handling	—Chief Health Officer	274 3216
	Director Health Surveillance	255 2838
Collection	—Hospitals and large medical facilities	
	Health Services Supply Centre	242 1355
	—Other regulated premises	
	Clinical Waste Controller	246 2889
Transportation of Dangerous Goods		
	—Dangerous Goods Inspectorate	246 2014
Incineration	—Health Services Supply Centre	242 1355
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	Health Services Supply Centre	242 1355
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	Landfill	
	Clinical Waste Controller	246 2889
	Chemical Wastes	
	Hazardous Chemicals Controller	293 5666
	Incinerator emission standards	
	Pollution Control Authority	293 5666

2 GENERAL INFORMATION

2.1 Definitions

2.1.1 The Clinical Waste Act gives several important definitions relating to clinical waste. These include:

"Clinical Waste" which means:

(a) waste consisting of any catheter, hypodermic needle, intravenous set, pipette or scalpel;

(b) waste consisting of any other instrument or object that has been used in the taking of blood, the testing, processing or handling of blood or blood products, the investigation of human or animal diseases or in analysis or research that involves the use of tissue or fluid specimens, whether human or animal;

(c) sanitary waste that originates from or has been in contact with a person suffering from tuberculosis or an infectious or notifiable disease within the meaning of the Public Health (Infectious and Notifiable Diseases) Regulations;

(d) sanitary waste that originates from or has been in contact with a person suffering from venereal disease within the meaning of the Venereal Diseases Act 1956;

(e) waste resulting from the investigation or analysis of tissue or fluid specimens, whether human or animal;

(f) biological or chemical waste resulting from the investigation of human or animal diseases;

(g) waste derived from a prescribed activity, being waste that includes or included human blood, or animal blood in any form other than food waste;

(h) human or animal tissue or body fluids, removed during surgery or an autopsy;

(i) waste consisting of a cytotoxic substance or waste that is, or is likely to be, contaminated by a cytotoxic substance;

(j) waste consisting of anything that has been in contact with waste referred to in a previous paragraph;

(k) waste derived from the preparation of a human body for burial or cremation; or

(l) waste declared by the Minister by instrument to be clinical waste for the purposes of the Act;

but does not include waste the treatment of which has been completed in accordance with the Manual;

"Prescribed activity", means:

(a) the provision of medical, surgical or dental treatment or nursing care;

(b) the provision of diagnostic or paramedical services;

(c) the provision of veterinary services;

(d) a practice, business or undertaking:

(i) conducted by a pharmacist, chiropodist or podiatrist;

(ii) that involves the taking of blood or the testing, processing or handling of blood or blood products;

(iii) that involves tattooing, acupuncture, depilation, ear or nose piercing, hair restoration or any other process requiring penetration of the skir of a live person;

(iv) that involves the investigation of human or animal diseases;

(v) that involves analysis or research involving the use of tissue or fluid specimens, whether human or animal; or

(e) an activity declared by the Minister by instrument to be a prescribed activity for the purposes of this Act;

"Regulated premises" means:

(a) a hospital;

(b) premises used primarily for the provision of accommodation and nursing care, or nursing care;

(c) a funeral parlour;

(d) a mortuary; or

(e) any other premises on which a prescribed activity is conducted or carried on.

2.1.2 The Act seeks to control the handling and disposal of clinical wastes within the above definition. However, radioactive wastes which are dealt with under the Radiation Act 1983, must achieve their decay storage to background and be cleared for disposal by the Radiation Safety Officer, prior to being disposed of as a clinical waste.

2.1.3 Regulated premises may generate, in addition to clinical waste, other waste which can be handled in the usual manner. Such waste may be office, kitchen supply, garden waste etc.

However, any waste which is not defined as clinical waste but which may have come into direct contact with clinical waste should be treated as clinical waste. It is important in the interests of efficiency and safety that non-clinical waste should be carefully segregated at all times from clinical waste.

2.2 Types, Sources and Hazards of Clinical Waste

2.2.1 Types of Clinical Waste

Infectious Waste is any waste containing micro-organisms, helminths or viruses which pose a potential threat to the health of human beings or any other user. It includes waste associated with patients requiring communicable disease isolation or suffering from infectious or notifiable disease as defined in the Public Health Act 1928; laboratory waste generated by microbiological or pathological investigation, used sharps (see definition), infected human and animal tissue, infected blood, swabs, dressings, etc.

Potentially Infectious Waste is waste which is contaminated with human or animal blood or body fluids which is generated during the treatment or investigation of any medical, dental or veterinary patient even though an infection is not known or suspected to be present. It may also be generated by animal experiments, tattooing establishments, blood banks, acupuncturists, pharmacies involved in ear and nose piercing, etc. The packaging, handling, storage and disposal of potentially infectious waste is as per infectious waste.

Sharps. These are any objects which may penetrate the skin and could cause injury, including scalpel blades, needles, intravenous spikes, broken glassware, amniotic membrane perforators, tattooing needles, nose piercing needles, acupuncture needles, etc.

Sharps pose several problems: In addition to their ability to inflict physical injury by penetrating the skin and subcutaneous tissue, they may, if previously used, transfer infection from a clinical sufferer or asymptomatic carrier of a disease, whether human or animal to the person injured by them. In the case of cytotoxic substances sharps may inoculate these substances into a person injured by them.

Cytotoxics. Cytotoxic substances are any substances which are carcinogenic, cytostatic, mutagenic or teratogenic. They are used in the treatment of cancers, auto-immune diseases, etc. By their nature they are either lethal to healthy tissue or may cause cellular mutations. Their effects may not be clinically recognised for many years, and they require special handling and disposal techniques.

Human and Animal Body Parts. Limbs, excised tissue, organs, animal carcasses, foetuses, placentae, etc. constitute a significant proportion of clinical waste. Disposal of certain items must take into account religious practices or sensitivities.

Glassware. Glassware is commonly used in prescribed activities. Broken glassware which has been used for clinical purposes, must be considered to belong to the category of *Sharps* and handled accordingly.

2.2.2 **Sources of Clinical Waste**

Clinical waste is derived from many activities defined by the Act as prescribed activities. It may originate from medical, dental or veterinary surgeries, mortuaries and pharmacies involved in nose and ear piercing, tattooing establishments, drug testing facilities, blood banks, hospitals, hospices, nursing homes, S.T.D. clinics, government agencies involved in the collection of syringes used by drug addicts, diabetics and immunisation campaigns, etc.

2.2.3 **Hazards of Clinical Waste**

Clinical waste is potentially hazardous to handlers and the general public if disposal is inappropriately managed.

Improperly packaged needles, sharp disposable items and broken glassware which might cause needlestick injuries or lacerations may be contaminated with chemical or infective organisms.

Infectious materials such as used dressings or swabs could transmit infection if improperly handled, both within regulated premises and if disposed of as ordinary garbage outside such premises.

Cytotoxic drugs have a well documented clinical toxicity. Many of these agents also have a direct irritant effect upon skin, eyes, mucous membrane and other tissues. They can cause local toxic and/or allergic reactions if handled without due care. Cytotoxic material should not come in contact with normal living cells. The clinical manifestations of such contacts may not be evident for a prolonged period of time, which is normally considered to be at least 10 years.

2.3 **Standardised Waste Disposal Bags, Colours, and Symbols**

2.3.1 Uniform and clear identification, including labelling, of clinical waste is essential for effective and efficient waste management for the following reasons:

(a) to ensure that certain types of waste are stored, transported and disposed of in a safe and acceptable manner;

(b) to minimise risks to staff by warning them of the nature, hazards and/or required disposal routes of the wastes in question;

(c) to provide a visual warning to emergency services personnel (e.g. police, fire, ambulance, emergency services), encountering accidents, injuries, or spills. This is important not only within regulated premises but also when waste is transferred for disposal elsewhere;

(d) to facilitate the training of staff undertaking occupational health and safety training courses;

(e) to reduce orientation costs and to minimise confusion when staff move between regulated premises;

(f) to ensure that staff involved in prescribed activities are aware of proper packaging, handling and labelling procedures.

2.3.2 Waste bags containing clinical waste from regulated or other premises must be tied securely and labelled in the appropriate manner to indicate the type of waste (infectious or cytotoxic) and the origin of the waste.

Labelling of the type of waste indicates to handlers, especially at the site of final disposal, the correct handling and disposal methods, while labelling with the origin enables the tracing of inappropriate packaged and handled waste. In the event of inappropriate packaging the problems can be defined and staff at the source can be educated to ensure that in future, they are aware of proper procedures.

As stated above, in the event of accident or spillage, emergency services personnel are provided with a visual warning so that they may avoid injury and take appropriate action to reduce hazards to the public.

2.3.3 The following colours and symbols are to be used in the ACT:

(a) yellow bag and black biohazard symbol for infectious waste;

(b) red bag and black trefoil symbol for radioactive waste;

(c) purple bag and white telophase symbol for cytotoxic waste — the standard colour is Violet II; and

(d) dark blue, over printed "veterinary wastes" for non infectious wastes and small animal carcasses.

2.4 **Unwanted or unused Medicines and Pharmaceuticals**

2.41 Although pharmaceuticals are not defined as clinical waste, they can present a hazard in the home and other premises.

2.4.2 The ACT Board of Health provides a service whereby unwanted pharmaceuticals are collected by the Pharmaceutical Services Section from Pharmacies. Pharmaceuticals may be returned to any pharmacy, which will arrange for their safe destruction.

2.4.3 Community Nurses employed by the ACT Board of Health are not permitted to collect unwanted pharmaceuticals. Carers or relatives of deceased patients are not legally permitted to retain, present or use any written prescriptions, repeat authorisations or dispensed medications issued to the deceased. They should, therefore, arrange for their collection by the ACT Board of Health or deliver them to a pharmacist.

UNWANTED PHARMACEUTICALS OF ANY TYPE MUST NOT BE DISPOSED OF IN THE SEWER.

3 SPECIFIC WASTE MANAGEMENT GUIDELINES

3.1 General, non clinical waste

Such waste includes waste from offices, supply departments, kitchens, gardens, maintenance departments, etc.

This waste does not represent a hazard greater than household waste, and provided it is carefully segregated from clinical waste, may be disposed of by normal trade waste services provided by the private contractors. However, if there is a possibility that such waste may come into accidental contact with clincial waste, it must be classed as clinical waste and treated accordingly.

3.2 Clinical Waste

Clinical waste is classified into three categories for disposal purposes: infectious and potentially infectious waste; sharps; and cytotoxics.

In general, all clinical waste is treated in the same manner, with additional requirements for sharps and cytotoxics.

Infectious and potentially infectious waste (excluding sharps and cytotoxic waste) must be segregated at the source and placed immediately into yellow plastic bags which bear the biohazard symbol and are marked "infectious waste". The bags should be securely tied off with the addition of a label denoting the source. Double bagging may be necessary if a single bag is not considered strong enough.

Internal collection of bags should be carried out frequently, and regular collection by a licensed clinical waste transporter is also necessary. Bags containing infectious and potentially infectious waste must not be stored for long periods of time and should not be transported by chutes, which may damage them.

A designated secure area should be set aside for the short-term storage of clinical waste, protected from weather and unauthorised access.

3.2.1 Sharps

There is now a greater awareness amongst health care personnel of the potential for accidental skin puncture by sharps to cause infection. The possibility of accidental sharp injury has increased over the last decade as the number and diversity of sharp disposable items have progressively grown. Most disposable sharps are used in conjunction with plastic disposable equipment, such as syringes or intravenous tubing, which in themselves are a disposal problem. The volume of disposable sharp/plastic equipment used in some areas may be considerable, and this may create difficulties in terms of safe disposal practices. There are special problems related to the disposal of sharps and other disposable items which are used for the administration of cytotoxic drugs. Recommendations for the disposal of such items are available in the appropriate sections herein.

3.2.2 Definition of sharps

Sharps are objects or devices having acute rigid corners, edges, points or protuberances capable of cutting or penetrating the skin.

The most common sharps encountered are metal needles and intravenous spikes. There are many others, such as disposable scalpel blades, lancets, stylets and broken glass items including ampoules, pipettes, tubes and syringes. Various hard plastic items, such as intact amniotic membrane perforators and broken plastic pipettes also constitute sharps.

3.2.3 Hazards

Accidents in handling sharps may result in a penetrating skin injury. This is a hazard not only for the prime handlers of sharps, but also for other personnel who collect, transport and dispose of them. Moreover, if sharps are not safely disposed of, they could present a health hazard to laundry personnel and other persons outside the health field.

In addition to the possibility of localised injury, subsequent infection could occur. This usually occurs when the sharp has been contaminated with a pathogenic (disease causing) organism. A variety of bacterial, fungal, and viral diseases can be transmitted in this way. Sharps contaminated with blood or other body fluids for a period of time may also act as a medium for the multiplication of micro-organisms and thereby be a source of high concentrations of organisms.

Some patients may be carriers of a virus or be in the pre-clinical stages of a viral infection, which can be transmitted via inoculation by a sharp contaminated with a body fluid. Hepatitis B virus, and to a much lesser extent the Human Immunodeficiency Virus (HIV) which causes AIDS (Acquired Immunodeficiency Syndrome), can be transmitted in this fashion as can zoonotic diseases from animals treated by veterinarians.

Because it may or may not be known that a patient is suffering from an infection or is a carrier of a pathogenic organism, it is necessary to regard all sharp items contaminated with body fluids as a source of potential infection.

Disposable sharps which during the course of their use are not usually contaminated with body fluids, such as needles used as airways in intravenous bottles, may become contaminated when placed in a container with other sharps. In this way, all disposable sharps can be contaminated and should be regarded as a source of potential infection.

By far the most common sharps injury is accidental needle-stick. This may occur when a needle is removed from a syringe or other appliance, when a needle is recapped, during the disposal of the needle after use, or at some stage during the transport or processing of the waste.

Needles should not be re-sheathed.

3.2.4 Prevention of Accidental Needle-Stick Injury

Great care should be taken to avoid accidental injury whenever handling needles which have been used to administer medication or to aspirate body fluid. If a body fluid specimen such as blood is collected, then the greatest danger of accidental inoculation for the operator or for an operator's assistant is when the needle is removed prior to emptying the syringe's contents into the collection vessel. Giving injections to or taking specimens of body fluid from patients who are uncooperative are other hazardous procedures.

Gloves must be worn where exposure to body fluid is possible.

Where possible, disposable needles should never be removed from syringes or other appliances after use; the needle and it's disposable attachment should be discarded into a special container. This includes, for example, needles used with disposable syringes, fistula needles and their plastic equipment, intravenous spikes and intravenous sets.

Needle nippers should not be used, and needles should not be purposely bent or broken by hand because these procedures themselves can cause accidental skin puncture.

The practice of inserting intravenous spikes or needles into their attached plastic tubing is also not recommended.

Discarding sharps attached to plastic intravenous sets will increase the volume of sharp materials requiring disposal, particularly in busy specialist areas. This can be overcome by using larger sharps containers and or more frequent collection of used containers.

In some procedures, the removal of the needle from the syringe is unavoidable. For example, when blood is collected for culture the needle must be changed and when the blood for blood gases estimation is collected and the needle is removed from the syringe. In these situations particular care is essential.

Where possible, needles should never be resheathed after use. Resheathing of needles has been a major cause of needle-stick injury.

Exceptions to this are when resheathing of needles must be carried out after drawing up medication or radioactive material for safety/sterility purposes prior to administration to the patient.

Sharps should be placed in the container with care.

The sharps should be dropped into the container with the sharp end first and never pushed into the container by hand. When the container is nearly full it should be closed and the outside cleaned and disinfected with a suitable agent (e.g. 1% sodium hypochlorite) and placed for collection and final disposal.

Sharps must only be placed in designated sharps containers.

A major cause of needle-stick injury is the careless or inadvertent placement of sharps in general rubbish containers or in laundry bags. Such containers are inappropriate and dangerous for the transport of sharps. Protrusion of needles from rubbish and laundry bags is a frequent cause of needle-stick injury.

Wrongful disposal of sharps, particularly when this results in accidents to other staff, should be referred back, as far as possible, to the original users of the sharp materials. For this purpose, it is desirable to put the name of the generator on the outside of each container.

Containers must be large enough to cope with the volume and bulk of disposable sharps used and must be impermeable to fluid and not readily penetrable by sharp items. They must be capable of being sealed adequately so that during transport the danger of contents spilling or falling out will be minimal. They must be constructed of material which can be incinerated but *preferably* not P.V.C. (polyvinyl chloride).

Disposable glass items such as tubes, pipettes and capillary tubes and some plastic items such as pipettes, are often contaminated by body fluids or organisms. These should be classed as sharps even if unbroken, because they often become broken and sharp when thrown into and compressed in containers, or during transport.

When sharps are known to have been contaminated with hazardous agents in the laboratory, such as Hepatitis B virus or HIV, they may be autoclaved before being collected for final disposal. Limitations on the effectiveness of autoclaving the contents of such containers should be appreciated. Containers in this case should be able to withstand autoclaving and should bear appropriate autoclaving indication devices.

Sharps should only be transported within the generating area in sharps containers with the lid or cap firmly in place.

Sharps must not be removed from the premises of the generating area other than by a licensed clinical waste transporter.

Disposable sharps containers must not be re-used. Once filled they must be removed from the premises by a licensed transporter and incinerated in the same manner as infectious waste.

The emptying of sharps containers for re-use entails considerable risk of injury by sharps and the possibility of infection if they are not adequately sterilised. Most containers suitable for the containment of sharps are not designed for easy access, cleaning and sterilisation.

Sharps containers must be yellow (with the exception of containers for sharps contaminated with cytotoxics) and marked with the biohazard symbol, and labelled to indicate their origin.

3.3 Cytotoxics

All cytotoxic drugs and contaminated waste must be disposed of by controlled high temperature incineration at 1100° celsius for 1 second residence time.

3.3.1 Definition

Cytotoxic waste has been defined as any residual cytotoxic drug following patient therapy or the material associated with the constitution or administration of cytotoxic drugs such as sharps, disposable gowns, caps, gloves and swabs. Cytotoxics include materials or drugs which are carcinogenic, cytostatic, cytotoxic, mutagenic and/or teratogenic.

3.3.2 Identification

A system has been devised which allows for easy identification of cytotoxic waste. A purple symbol which represents a cell in late telophase period of mitosis is used to denote cytotoxic materials. Items bearing the symbol such as purple bags and boxes, are easily recognised as cytotoxic waste. This is important because the mode of disposal is different from many other kinds of waste.

Intravenous materials (intravenous giving sets and pre-filled syringes) should be clearly labelled with a self-adhesive cytotoxic label.

Sharps should be placed in an appropriate sharps container labelled "Cytotoxic sharps . . . . for incineration at 1100° C.". Other items such as gowns, caps, gloves, swabs, etc. should be placed in a purple and white plastic bag marked "Cytotoxic Waste" which in turn is placed into appropriate bins or other suitable receptacles for transport to a holding area. The bags should then be placed either in cartons with a cytotoxic waste label attached, or alternatively, the pre-printed purple and white colour coded, CYTOTOXIC WASTE DISPOSAL SERVICE cartons.

3.3.3 Pharmacy

If cytotoxics are prepared, constituted or diluted in a pharmacy area the cytotoxic waste should be handled and disposed of in the same way as in other areas. The pharmacist should ensure that the waste carton displays specific address details for the incineration facility, and the name of the institution or premises from which they originate.

3.3.4 **Contaminated linen**

Contaminated linen should be placed into large alginate-threaded plastic bags or double dissolution alginate bags which are printed "cytotoxic contaminated". The bag should be sealed and then placed in a bag which is overprinted with the purple cell symbol and the words "Cytotoxic Contaminated", and then kept separate from the other linen which is to be collected for laundering.

At the laundry or linen service the outer bag should be removed as the contents are placed into the washing machine and then the outer bag also placed in the washing machine. If the inner bag is to be handled at the laundry, disposable gloves should be worn and placed in the machine before closing the door.

3.3.5 **Accidental spills**

It is recommended that adequate supplies of suitable absorbent material be stored close to the area of constitution or administration of the final dose form of cytotoxics. Suitable materials include sawdust, commercially available absorption granules, detergents, or "cytotoxic spill" kits.

The use of appropriate alkaline detergents (e.g., Decon 90. Extran) can assist with the removal of coloured compounds which stain many surfaces.

If selected chemical reagents are used to decompose and "inactivate" a specific cytotoxic spill, staff must be fully aware that they could be handling by-product materials which may be biologically active mutagens as potent as their parent compound. Consequently, all wastes generated as a result of such chemical treatment should be treated as cytotoxic. Double gloving must be practised during any spill, chemical decomposition or cleaning-up process.

3.4 **Disposal of Clinical Waste**

3.4.1 The Act empowers the Minister to declare specified places for the disposal of clinical waste.

3.4.2 All clinical waste must be incinerated at 1100° celsius for one second in the secondary chamber in an incinerator gazetted for clinical waste disposal and meeting the emission standards set by the Pollution Control Authority.

3.4.3 Disposal of clinical wastes by landfill is an undesirable option and only likely to be approved under extenuating circumstances.

Risks associated with landfill disposal include accidental injury of landfill operators and the public, and the contamination of ground water. Many pathogenic organisms and cytotoxic drugs remain viable for a long period of time, posing a significant threat to the community if not disposed of properly.

3.4.4 Disposal of body fluids such as urine, vomitus and excreta is by toilets or sluices. Gloves should be worn during these procedures.

4 PREDISPOSAL TREATMENT AND STORAGE

4.1 Autoclaving

Autoclaving can be useful for sterilising certain types of contaminated pathology items and infectious waste prior to disposal.

Autoclaving should not be used with a view to sterilising items where high pressure steam penetration is questionable, because of the compaction of wastes or the presence and volume of fluids involved in the waste stream.

Any materials subjected to autoclaving must be visibly identified by affixing appropriate autoclave indicator devices to the exterior of the container/packaging.

4.2 Sharps

Sharps must be placed in a rigid, impact resistant, puncture proof and sealable container of appropriate size and coloured yellow with the black biohazard symbol.

All sharps must be regarded as Infectious Waste unless contaminated by cytotoxics, in which case a cyctotoxic sharps container must be used.

The container must be appropriately labelled and stored in the infectious waste store, or where appropriate, the cytotoxic waste store.

The disposal route for sharps is high temperature incineration.

4.3 Infectious Materials

Infectious waste should not be stored for long periods in the generating area. If clinical waste cannot be removed from premises for incineration within a reasonable time, it should be stored in a lockable refrigerated room which is clearly identified.

Storage areas for infectious waste should be clearly labelled with the biohazard symbol and the words "Infectious Waste".

Infectious waste should be double bagged in yellow plastic bags where collection is not serviced by a collection bin (660 litre Sulo bins or similar), in which case single bagging may be suitable.

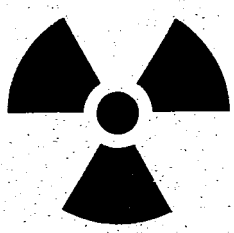
Reusable containers for infectious waste should be clean, in good repair and thoroughly washed and decontaminated by a method approved by the Clinical Waste Controller. Such containers should be clearly identifiable as being solely for "infectious waste".

Under no circumstances should infectious waste be fed into a compactor, mulcher or grinder prior to disposal, unless a totally sealed system, approved by the Clinical Waste Controller, is utilised.

Please note: All sharps should be regarded as infectious waste.

4.4 Radioactive Materials

All premises which dispose of radioactive waste should provide a secure, clearly identifiable store labelled with the international radioactivity hazard symbol.



Interim Storage

It is often necessary to store waste radioactive materials. These materials which may be solid or bulk liquid in closed containers should be kept in secure stores, which meet with the NHMRC "Code of Practice for the Disposal of Radioactive Wastes by the User (1985)". Each container should be clearly labelled with a description of the radioactive contents, the activity when stored, the anticipated date when it may be released from the store and the name of the person responsible for placing it in the store. An accurate inventory of all containers and their contents in the store at any time should be maintained. Only the Radiation Safety Officer (RSO) or persons authorised by the RSO should release material for disposal.

It is recommended that whenever radioactive (or decayed radioactive) clinical wastes are transported off site for temporary storage or disposal, they be accompanied by a Clinical Waste Transport Certificate to enable all relevant parties to be aware of the wastes movements.

4.5 **Pharmaceutical Aerosol Cans**

To minimise the danger of explosions which occur during incineration aerosol cans should be packaged in not more than 10 large (>80g) or not more than 25 small aerosols. The packages should be clearly labelled "Pharmaceutical Substances: Aerosols" and not be put together with other waste into larger containers.

5 COLLECTION

5.1 **Collection from hospitals/institutions**

Collection of clinical waste from ACT hospitals and principal medical institutions is currently carried out by the Health Services Supply Centre of the ACT Board of Health. Provision is made for other major transport operators to be licensed to perform this collection service.

5.2 **Collection from private practices/clinical waste generators**

Collection of clinical waste from private practices and other clinical waste generators is to be carried out by licensed transport operators, who are to collect the waste from the regulated premises and transport it to an incinerator gazetted under the Clinical Waste Act 1990 for the incineration of clinical waste, where it will be receipted for incineration.

5.3 **Collection by individuals/home-care agencies**

Collection of clinical waste by home nursing services and individuals transporting used needles to needle-exchange program centres, will be exempted from transport licensing and documentation. However, transport control and documentation is to commence at the sponsoring medical clinic/centre or needle exchange program centre until final disposal. Persons conducting house calls or home care services which generate clinical wastes i.e. needles, swabs and dressings, are to be equipped with sharps containers and infectious waste bags.

5.4 **Syringe Collection Service**

The ACT Government's Waste Management Section operate a 24 hour sharps collection service for syringes located in public areas which pose an immediate risk of accidental needle stick to members of the community. Contact numbers for this service are either Operations — Allara Street 246 2158 and after hours through Fyshwick Depot radio room 280 3311. This service is not available for the routine collection of clinical waste including syringes from other sources.

6 TRANSPORTATION

6.1 Dangerous Goods Requirements

This information summarises the relevant requirements from the fourth edition of the Australian Code for the Transport of Dangerous Goods by Road and Rail (Gazette No P15, 7 April 1987) henceforth referred to as the "Code".

Transport permits issued under the Clinical Waste Act 1990 require that the transport of prescribed wastes be undertaken in accordance with this Code, where applicable.

6.1.1 What are Dangerous Goods?

Dangerous goods are those substances or materials which have properties that may be considered hazardous if appropriate precautions are not taken. Dangerous Goods can be categorised according to their "Hazard Class" which provides a warning as to the predominant hazard of the material e.g. Explosive, Poisonous, Corrosive, Flammable, Infectious, Radioactive, etc.

Dangerous Goods are listed in Section 9 of the Code where they are assigned a United Nations (UN) number for ready reference. UN numbers are an internationally accepted system for identifying dangerous goods.

6.1.2 Identification of Dangerous Goods

Where the prescribed waste can be described accurately by the use of a UN number, i.e. it is listed in the Code specifically or by way of a general classification [e.g. UN 2810, poisonous (toxic) liquid, not otherwise specified (n.o.s)], the material in question is considered to be dangerous goods. Section 2 of the Code describes the criteria for the classification of the different classes of dangerous goods. However for wastes, this is often not easy to determine. For this reason the simpler approach of the application of a UN number is used.

Dangerous Goods requirements are to be applied to all prescribed wastes that can be assigned a United Nations number.

Prescribed wastes for which no UN number is appropriate or applicable are deemed not to be dangerous goods and are assigned the code 30XY —Environmentally Hazardous Waste — and the provisions of the Code do not apply with regard to labelling, and packaging. However the Clinical Waste Act 1990 requirements still apply (i.e. transport certificate, transport permit, licensed disposal site, etc).

The transport certificate for prescribed wastes contains information relating to the hazard of the waste (e.g. UN number, UN hazard class and packaging group — if applicable) in compliance with the United Nations and Australian requirements for dangerous goods.

Of the following types of prescribed clinical wastes, five may be considered as dangerous goods and the relevant provisions of the Code apply. They are:

(a) infectious waste (includes sharps);

(b) potentially infectious waste;

(c) cytotoxic waste;

(d) pharmaceutical substances and residues; and

(e) laboratory chemicals and solvents.

Incinerator fly ash and residues are not classed as dangerous goods.

Decayed radioactive wastes i.e. wastes arising from nuclear medicine and diagnostic radioimmunoassay which, prior to disposal, are stored until below the acceptable radioactive levels set by the ACT Board of Health, are not considered dangerous goods unless the presence of other materials causes them to be considered as such (e.g. scintillation liquids in toluene). Where flammable liquids are present the applicable provisions of the code apply. The disposal of radioactive and decayed radioactive wastes is controlled by the ACT Board of Health's Radiation Safety Section (phone 06 247 2899). It is required under the Clinical Waste Act 1990, that transport certificates be used for decayed radioactive clinical wastes when transported off-site for disposal.

6.1.3 Placarding and Signs for Transport Vehicles

The Code requires vehicles which transport prescribed wastes, that are dangerous goods, to display appropriate package labelling, and the relevant hazard class diamond-shaped placards at the front and rear of the vehicle whilst the waste is in transit.

For prescribed clinical wastes this applies to any amount of:

(a) **cytotoxic waste** — use UN Hazard Class 6.1 (Poison), and recommended cytotoxic symbol.

(b) **infectious waste** or potentially infectious waste — use UN Hazard Class 6.2 (Infectious Substances).

(c) **pharmaceuticals (apart from cytotoxics) and small amounts of laboratory chemicals and solvents do not require any placarding of the vehicle.**

6.1.4 Packaging Requirements

The performance testing requirements for the different packaging groups that have been assigned to prescribed clinical wastes, which are also dangerous goods, are detailed in Section 5 of the Code.

There are three UN packaging groups; I, II and III. Packaging group I is for the most hazardous waste and packaging group III is for the least hazardous. Typically for clinical wastes, plastic bags (in some cases double bagged) inside cardboard boxes, suffice for packaging groups II and III. Packaging group I would require additional containment in a sealed plastic or metal drum, or trolley. However it is recommended that some further containment in sealed plastic trolleys be used for all clinical wastes. These trolleys should be compatible with any mechanical unloading/ loading devices that may be in use, to ensure both safety and ease of handling for hospitals, transport and disposal staff.

6.1.5 Transport Requirements

Requirements for transport, such as the design and construction of vehicles, insurance and maintenance, are detailed in Section 8 of the Code. The owner of the vehicle is responsible for ensuring that the vehicle is maintained in a clean and roadworthy condition and that all load securing devices are in good condition. Additional requirements are shown later in Chapter 6 of this manual.

Vehicle insurance is required for a sum of not less than $5,000,000 if the vehicle is transporting dangerous goods in packages, as is the case for clinical wastes. Insurance should be provided with a third party property clause in respect to loss or damage that arises, and costs for cleanup incurred by, or on behalf of, a public authority as a result of fire, explosion, or spillage of dangerous goods on or from the vehicle.

Precautions, vehicle identification, package labelling, and documentation of Emergency Information Guides are also explained in this section along with provisions for safety equipment and driver instruction.

6.2 Licensing of Transport Agencies

6.2.1 The Clinical Waste Act 1990 requires that agencies transporting clinical wastes be licensed to operate within the ACT. Conditions applicable to licensing are contained in Part IV of this Act. An application for a licence in the format shown at the end of this chapter, may be obtained from the Clinical Waste Controller, 1st Floor, North Building, Civic (phone 06 246 2889). Fee structuring advice will be promulgated through ACT Government Administrative Orders and is available on request from the Clinical Waste Controller.

6.2.2 The transport agency needs to be able to provide the following information:

(a) personal or company details — including personal address or registered office, certificate of incorporation or registration of business name, person authorised to make statements on behalf of the applicant/company;

(b) vehicle details for the issue of transport permits including make and model, registration number, carrying capacity, and address at which normally garaged; and

(c) types of clinical wastes to be transported.

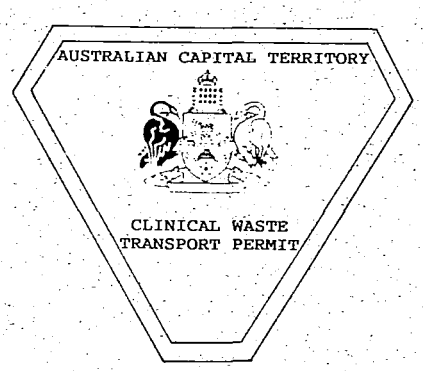
6.2.3 The licence is normally issued within three weeks of application. The grant or refusal of a licence will be inaccordance with Part IV of the Act. The vehicles to be used for clinical waste transport must be available for inspection by the Clinical Waste Controller prior to the issue of a licence and transport permits. The licence may contain any conditions, limitations or restrictions considered appropriate by the Clinical Waste Controller and may be suspended or cancelled in accordance with the Act. Specific guidelines shown at paragraph 6.5 below, form the basis of the licence conditions which are legally binding.

6.3 **Transport Permits**

6.3.1 Licensed clinical waste transporting agencies will require transport permits for each individual vehicle used to transport clinical waste. This requirement is to ensure the vehicle's identity and conformity with the minimum vehicle standard as per paragraph 6.4, for the safe transport of clinical wastes.

6.3.2 Application for a vehicle transport permit should be made in conjunction with the application for a licence to transport clinical waste. Transport permits are not transferrable and subsequent vehicles to be used under the licence will require individual permits. An application form for additional transport permits may be obtained from the Clinical Waste Controller.

6.3.3 The permit places a number of conditions on the driver, vehicle and agencies' operating procedures, as shown at paragraph 6.6 below. Permitted vehicles display a prominent decal on the front windscreen, as per the sample shown below.



6.4 **Clinical Waste Vehicle Standard**

6.4.1 The vehicle used for the transport of prescribed clinical wastes should have:

(a) a lockable load compartment, physically separated from the driver's cabin by a solid partition;

(b) the walls and floor of the compartment should be as smooth and seamless as practicable for easy cleaning and compatible with any proposed disinfection program. The compartment's floor must be bunded and drained to a sump which can easily be emptied and cleaned. Where wastes are further contained during transit in sealed metal or plastic bins, or trolleys that are approved by the Clinical Waste Controller, the requirement for a drainage sump may be waived;

(c) provision of equipment and materials to manage a spillage situation (e.g. absorbents, bucket, water, disinfectant, mop with disposable head, shovel, gloves, disposable overalls, facemask/shield, torch, disposable containers, plastic waste bags, labels);

(d) holders to display the appropriate hazard placarding (e.g. Class 6.2 — Infectious; Class 6.1 — Poison) or approved equivalent. The mixed class label (Class 9 — Dangerous Goods) should not be used;

(e) stocks of the appropriate placards; and

(f) detailed instructions prominently displayed in the cabin for use in the case of spills, accidents, fire or other emergencies, including contact personnel.

6.5 **Specific Guidelines**

6.5.1 The following guidelines form the basis of the permit conditions which are legally binding:

(a) infectious (yellow bag with black biohazard symbol) waste — the waste should be further contained during transit in drums, boxes or appropriately designed garbage trolleys of the relevant colour. Double bagging is also recommended in certain instances

If the container cannot be obtained in the appropriate colour, it should have the relevant colour painted, or applied by an adhesive band, around the entire bin or package and on which the biohazard symbol is displayed in black on at least two sides;

(b) Cytotoxic (purple bag) waste is similarly treated, although in this case the purple telophase symbol is used;

(c) the lid of the drum, box or garbage trolley should be able to be closed securely, with a good seal to stop any discharge of the contents. The lid should not open if the container falls on its side or is dropped. Once sealed, the inner drums, bags or boxes must not be opened;

(d) packaging, labelling and transport of the waste to a licensed disposal site must be conducted in a manner that complies with this manual and other guidelines issued by the ACT Board of Health; and

(e) any spillage or loss of waste material during transport or in an accident, must be reported to the Clinical Waste Controller by phone within 24 hours of the incident.

6.6 **General Transport Permit Conditions**

The relevant general permit conditions applicable to all vehicles transporting clinical wastes are summarised below.

Vehicle Maintenance

The vehicle covered by a Clinical Waste transport permit must be maintained in a clean and road-worthy condition and display, at all times, its current permit identification label on the front windscreen. Replacement decals are to be affixed to the windscreen within 7 days of issue by the Clinical Waste Controller.

The vehicle must be suitably designed and constructed, and all precautions taken, so as to prevent the spillage of waste from the vehicle whilst the waste is in transit.

Waste Containment

All waste containers must be completely sealed and safely and securely stowed on the vehicle. Incompatible wastes must not be mixed or placed in the same container.

When the vehicle is being used for the transport of bulk liquid waste, the permit holder must ensure that suitable waste sampling points are provided and, the design of discharge equipment and its point of attachment to the container are acceptable to the Clinical Waste Controller.

Waste Discharge

The permit holder must ensure that waste is discharged only at premises licensed under the Clinical Waste Act 1990 for the receipt of such waste.

The permit holder must notify the Clinical Waste Controller by phone within 24 hours of any spillage of waste from the vehicle.

Australian Transport Code

When the vehicle is being used for the transport of prescribed industrial waste which are also prescribed as dangerous goods, the permit holder must ensure that such transport complies with the Australian Code for the Transport of Dangerous Goods by Road and Rail, Commonwealth of Australia, 7 April 1987 (Gazette P15). Inquiries regarding dangerous goods should be directed to the Dangerous Goods Inspectorate (06) 248 2159.

Driver Training

The permit holder must ensure that the driver of the vehicle has completed a course of instruction approved by the Clinical Waste Controller on the transport of such waste.

Insurance

The permit holder must hold a current insurance policy with a third party property clause for the sum of not less than $5,000,000 when the vehicle is used solely to transport waste in packages, in respect of loss or damage that arises and costs of clean-up or removal incurred by or on behalf of the Clinical Waste Controller as a result of fire, explosion, leakage or spillage of waste in or on or from the vehicle.

6.7 **Package Labelling and Vehicle Placarding**

Vehicles which transport prescribed (clinical) wastes, that are also dangerous goods, must do so in accordance with the Australian Transport Code for Dangerous Goods. Packages and containers, must display appropriate **package labelling.** The vehicle must display relevant **hazard class diamonds,** where applicable, at the front and rear of the vehicle, whilst the waste is in transit.

Package labelling is the responsibility of the waste producer. Hazard class diamonds, known as placards, are the responsibility of the waste transporter. Placards must only be displayed whilst the vehicle is transporting waste.

For prescribed clinical wastes this applies to any amount of:

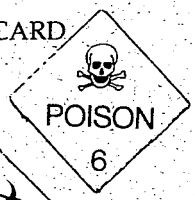
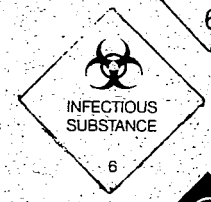
(a) **Cytotoxic waste** — use UN Hazard Class 6.1 (Poison), and recommended cytotoxic symbol;

(b) **Infectious waste or Potentially Infectious waste** — use UN Hazard Class 6.2 (Infectious Substances); and

(c) **Pharmaceuticals** (apart from cytotoxics) **and small amounts of laboratory chemicals and solvents do not require any placarding of the vehicle.**

The format for vehicle placarding is given below:

FORMAT FOR VEHICLE PLACARDS

COLOUR	PLACARD	SIZE
BLACK ON WHITE (reflective)		250 x 250 mm MINIMUM
BLACK ON WHITE (reflective)		250 x 250 mm MINIMUM
WHITE ON PURPLE (reflective)		250 x 250 mm MINIMUM

NOTE: TO BE DISPLAYED AT THE FRONT AND REAR OF THE VEHICLE ONLY WHEN TRANSPORTING THE RELEVANT PRESCRIBED WASTES. ADVICE ON SUPPLIERS OF THESE PLACARDS MAY BE OBTAINED FROM THE CLINICAL WASTE CONTROLLER.

6.8 **Clinical Waste Tracking System Transport Certificate**

The transporter is required to complete Part B of the transport certificate only. This must be done completely and accurately. The permit number is specific to a vehicle's registration number and is not transferable.

In some instances the collection and transport service offered may include the supply of a transport certificate for the client, and for regular customers it may also include the completion of Part A of the certificate on the producer's behalf. However, the producer of the waste must sign, date and enter the quantity of waste that is to be transported.

The transporter may only sign and date Part A if they are registered as an accredited agent by the producer and the Clinical Waste Controller.

If permission is given by the Clinical Waste Controller and the waste producer, the accredited agent may also complete a transport certificate for wastes collected from a number of sources where the amount collected at each premises is small. In this case the transporter is declared as the accredited agent who then takes on the responsibility for proper and legal waste disposal. A docket indicating the accredited agent's permit number, quantity of waste collected and date of service must be left with the client by the transporter as a record of the wastes legitimate disposal.

An accurately completed transport certificate must be carried in the driver's cabin at all times whilst the waste is in transit.

Further information may be obtained from the Clinical Waste Controller on (06) 246 2889.

APPLICATION FOR LICENCE TO TRANSPORT CLINICAL WASTE IN THE AUSTRALIAN CAPITAL TERRITORY

APPLICANT DETAILS

Name or Company Name:

Personal Address or Registered Office Address:

Certificate of Incorporation or Registration of Business Name:

(copy to be attached)

Person authorised to Make Statements on Behalf of the Applicant/ Company:

Contact Phone: Contact Fax:

CLINICAL WASTE TRANSPORT VEHICLE PERMIT DETAILS

Make: Model:

Registration Number: Carrying Capacity:

Date Available for Inspection:

Address at Which Normally Garaged:

Authorised Insurer:

Policy Number: Expiry Date: / /

CLINICAL WASTE COLLECTION DETAILS

Types of Clinical Waste to be Collected:

Infectious/Potentially Infectious

Cytotoxic

Pharmaceutical Substances and Residues

Laboratory Chemicals and Solvents

Method of Collection/Containerisation Proposed:

On-board Securing Method Proposed:

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7 DISPOSAL

7.1 Incinerator Criteria and Usage

Disposal of clinical waste by incineration is dependent upon the design, siting and control of incinerator units, availability of storage facilities on site and quality of the transport vehicles used for collecting the waste products.

Existing incinerators to be gazetted for disposal of clinical waste in the ACT, will need to comply with the air emission standards laid down in the Air Pollution Act 1984 and as monitored by the Pollution Control Authority. New incinerators or upgrading of existing incinerators will require clearance of siting and emission criteria by the Pollution Control Authority, as part of the planning and building approval process.

7.1.1 Design Characteristics

With the continually increasing amount of waste being generated and the high content of plastics and other potentially toxic substances, the design of clinical waste incinerators is of great importance. Efficient destruction using controlled high temperature incineration is required and the incinerator facility should be designed to safely incinerate the various types of waste which are collected.

In a clinical waste incinerator the main emissions are hydrogen chloride, carbon dioxide, water, nitrogen oxides and particulates. There are also trace amounts of unburnt hydrocarbons, carbon monoxide and heavy metals. The effects of hydrogen chloride or the oxides of nitrogen on the respiratory system, and carbon monoxide on the cardiovascular system are well documented.

(a) **Capacity of Unit**

The incinerator must be designed to have sufficient capacity to adequately cope with present and expected future demands. **Overloading can result in Incomplete incineration, unwanted emissions and greater maintenance problems;**

(b) **Incineration Temperatures and Residence Times**

If potentially toxic substances are to be incinerated, adequate temperature requirements in the primary and secondary chamber must be reached in conjunction with the correct residence time in the secondary chamber. Incinerators for clinical waste should be automated and have a primary chamber with an induced or controlled air system and a secondary chamber which reaches a temperature of at least 1100°C with a minimum residence time of 1.0 sec.

If the correct temperature and residence time is not achieved, waste may not be completely incinerated resulting in smoke, particulate fallout, odour and variety of potentially toxic emissions.

Because of the importance of ensuring the complete combustion of cytotoxics, pharmaceuticals and other toxic substances, the incinerator's chambers should be equipped with temperature recording and control systems. Suitable equipment to continually monitor the gaseous emissions, should be installed in accordance with the Pollution Control Authority's requirements for clean air emissions;

(c) **Turbulence**

Adequate mixing of waste gases, burner gases and combustion air in the secondary chamber is critical in order to obtain efficient combustion. Design considerations are necessary to ensure adequate mixing for a range of flow rates through a given unit, to minimise the risks associated with short path laminar flow and "cold spots" within the incinerator;

(d) **Loading Mechanism**

Automatic loading devices are to be fitted to incinerators used for clinical waste. During automatic loading, waste placed in a hopper is "rammed" into the primary chamber of the incinerator through an opening normally sealed by a fire door. This protects the attendant from possible blow-back and/or explosion from the primary chamber and allows more efficient loading of the unit. For greater ease of loading, the hopper should be serviced by a ramp, be fitted with an automatic loading device (e.g. tippler) and be appropriately protected by safety rails. Direct access to the hopper by means of a chute is not advisable because the hopper may become overloaded, and because odours or smoke may pass up the chute. If there is a mechanism for automatically emptying bins into the hopper, then this should be pre-tested to ensure that bins are completely emptied and there is no spillage outside the hopper.

7.1.2 **Maintenance**

The refractory lining inside incinerators which are only used intermittently, is subjected to repeated thermal shock causing high rates of wear. Overloading also reduces refractory lining life. These are factors leading to the need for frequent (every 1-2 years) maintenance of many incinerators. Increasing amounts of waste containing glass are being incinerated as part of the recommended disposal practices for sharps, pathology, infectious, or cytotoxic waste. Slag from melted glass may cause problems by blocking air induction tubes connecting with the primary chamber and by sticking to the sides of the primary chamber thereby interfering with cleaning and incinerator efficiency. Ready access to the incinerator unit itself is necessary for routine maintenance. Therefore, adequate space must be left around and under the unit to allow cleaning of air induction tubes and for collection and storage of ash. When re-bricking is required, space must be available for storage of new bricks, equipment and rubble. Large units require a skip to collect resultant ash and unburnt materials such as metals and slag.

There should be ready access to the incinerator house itself to enable vehicles to bring waste close to the unit, including doorways large enough to allow trolleys and/or motorised vehicles to pass through. Access to the outside for disposal of ash in bins, barrels or skips should be facilitated. Incinerators can require replacement, therefore ready access for large pieces of equipment at the incinerator house is obviously necessary.

7.1.3 **Safety Devices and Procedures**

All units should be fitted with an explosion fail-safe mechanism. (Hydraulic oils used in the loading ram system should be non-flammable.)

The incinerator room or house should be adequately ventilated to reduce exposure of staff to emissions. Mechanical exhaust from the incinerator room should be discharged safely to the exterior in compliance with ACT Building Regulations. Automatic loading hoppers should be equipped with air scavengers to reduce emissions from the primary chamber entering the room during loading. Ventilation of the incinerator room should be designed so as to take into account the amount of waste passing through the room and the provision of combustion air for the incinerator, and be defined in units of air flow per time.

Persons responsible for the management of incinerators must ensure that operating temperatures of incinerator units are not lowered below minimum specified levels as an economy measure due to the dangers associated with incomplete combustion of potentially harmful substances, such as PVCs.

Spill kits, safety showers, eye wash kits, comprehensive first aid cabinets and information should be provided and clearly labelled for easy identification.

Automatic sprinklers, fire alarms and hoses and adequate fire safety sign posting should be provided after consultation with the ACT Fire Brigade.

Adequate safety devices should be fitted in the form of system interlocks and alarms, spark arresters and explosion fail safe valves. Safety procedures relating to incinerator operation must be documented and made available to attendants. Additionally, such documentation should be suitably displayed in the immediate area.

All wash-down fluid used in the incinerator room should pass into a sump prior to being disinfected and then discharged into the sewer and not into storm water drainage. This is important if there has been any accidental spillage of potentially hazardous materials, such as infectious, cytotoxic or radioactive waste.

Any containers of ashes removed from incineration units should be carefully dampened and allowed to stand for a sufficient time (e.g. a day) to ensure that the contents are not a source of ignition and possible damage to the transporting vehicle, the environment or the disposal site.

In order to effectively manage the complex factors associated with the incinerator function and due to the varied nature of typical clinical waste streams, it is imperative that incinerator operation is placed under the control of suitably experienced persons and that adequate training is provided for attendants.

7.2 Siting Characteristics

An incinerator should be located in an industrial area, providing a buffer zone, as far away as possible from other buildings and adjoining properties.

The incinerator unit should be positioned as far away as possible from air conditioning intake vents and/or buildings with windows that open for air circulation.

Incinerators with short stacks are not acceptable due to wake effects.

The Environment Protection Service should be consulted for advice on siting and emission standards.

7.3 Sewer

Under no circumstances are infectious materials or diluted drugs and laboratory wastes to be admitted directly to the sewerage system, unless approval has been given by ACT Electricity and Water.

7.4 Landfill

Those wastes which are not potentially hazardous can be safely disposed of by appropriate landfill. This includes paper (not contaminated by patient's tissues of fluids), cardboard, boxes, tins, glassware (not contaminated by blood or body fluids, radioactive or cytotoxic materials), kitchen waste, animal refuse, garden waste, some engineering wastes, and certain aerosol packages. In many instances it is preferable that such wastes are disposed of by landfill, to reduce the volume of waste requiring incineration. Incinerator ash must be disposed of at landfill sites licensed to accept industrial waste.

7.4.1 Prohibited Wastes

The following wastes must not be disposed of, at any municipal landfill in the ACT:

(a) Cytotoxic wastes;

(b) Pharmaceutical, laboratory or hazardous chemicals;

(c) Medium or high level radioactive wastes;

(d) Untreated infectious wastes (i.e. infectious or potentially infectious wastes not rendered inert by incineration or autoclaving); and

(e) Untreated sharps or unused (expired life) supplies of sharps which have not been incinerated.

If these wastes are interred in landfill, they may contaminate ground water or surface waters, or pose a hazard to landfill staff, authorised tip face recyclers or the public using the site.

It is the responsibility of clinical waste generators to ensure that these wastes are handled and disposed of separately, and not mixed with the general waste stream which is interred at landfill.

The disposal of hazardous chemicals at the Hazardous Chemicals and Chemical Wastes Disposal Facility at West Belconnen landfill requires prior clearance from the Environment Protection Service, telephone 293 5666.

7.4.2 Supervised Burial

The wastes listed below may be disposed of at municipally operated landfills:

- Treated infectious wastes (i.e. infectious wastes rendered inert by incineration or autoclaving).
- Potentially infectious wastes rendered inert by incineration or autoclaving, or untreated, when other methods are unavailable.
- Incinerator ash.

The above listed wastes must be rendered inert and meet the following conditions:

(a) treatment procedures described in this manual have been strictly followed to ensure the wastes are virally inert;

(b) the facility is a supervised landfill and is monitored by the Clinical Waste Controller;

(c) the clinical waste generator has obtained prior permission to dispose of the waste from the Clinical Waste Controller;

(d) the burial is performed under the supervision of and to the satisfaction of the Director Health Surveillance (or his/her respresentative); and

(e) the wastes are deposited at the base of the top face and covered immediately with a layer of earth or other dense and non-combustible material not less than one metre in depth.

7.4.3 Unsupervised Disposal

The following solid inert wastes may be disposed of at any landfill controlled by the Clinical Waste Controller without the need for specific supervision:

(a) kitchen wastes and food scraps;

(b) packaging; and

(c) general wastes such as administration waste, building waste, garden waste and discarded equipment such as beds and mattresses.

It is the clinical waste generator's responsibility to ensure that these wastes have not been contaminated by other wastes having special disposal requirements.

Waste disposal contractors should always be fully informed of the nature of all waste they are required to transport and whether it has been pre-treated.

7.5 Reclamation/Recycling

Reclaiming and recycling centres should be used as part of a waste minimisation program for the processing of non-contaminated plastics, cardboard, paper, computer print out, paper, glass or metal containers.

Special collection containers should be provided for materials such as dental amalgams, mercury batteries, nickel-cadmium batteries and silver oxide batteries, to prevent their entry into the environment either by landfill or incineration. These wastes are to be disposed of at the Hazardous Chemicals and Chemical Wastes Disposal Facility at West Belconnen landfill site or through metal reclaiming agents.

7.6 **Declared Clinical Waste Disposal Facilities**

Health Services Supply Centre Incinerator, Sandford St, Mitchell — for incineration of all types of clinical waste.

John James Memorial Hospital Incinerator, Strickland Cres, Deakin — for incineration of non-cytotoxic clinical waste originating only from John James Memorial Hospital, for a period of three years from the authorising Gazette notice.

7.7 **Sharps disposal machine**

Provision will be made for the evaluation, approval and introduction of a needle grinding machine with reusable sharps containers, which meets health standards for machine cleanliness and treatment of the reduced product prior to incineration. This system is under development and has the potential to reduce the quantity of plastic incinerated, thereby reducing throughput volumes, sharps container costs, incinerator refractory wear, certain emissions and incinerator fuel costs for non-cytotoxic wastes.