

Guidelines for the Management of Biomedical Waste in the Northwest Territories

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Guideline for the Management of Biomedical Waste in the Northwest Territories

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1 Introduction

Biomedical waste originates from human or animal health care, medical research, medical teaching facilities, funeral establishments, laboratories and other facilities. A portion of that waste stream is infectious or potentially infectious and presents a potential hazard to the public health and the environment.

Infectious or potentially infectious biomedical waste is a contaminant under the *Environmental Protection Act* (EPA) of the NWT and must be managed as a hazardous waste.

The objective of these guidelines is:

- To provide uniform standards for the segregation, management and disposal of infectious or potentially infectious biomedical waste.
- To reduce the incidence of health care worker and the public from contacting a disease or injury from biomedical waste.
- To provide guidance to the health care system on the opportunities for waste minimization and the reduction of air contamination from incineration of biomedical waste.

The Canadian Standards Association under the direction of the Canadian Council of Ministers of the Environment (CCME) prepared a national guideline document for the management of biomedical waste in Canada. The Guidelines for the Management of Biomedical Waste in Canada, Environment Canada (CCME-EPC-WM-42E), 1992 was prepared to promote uniform practices and set national standards for managing biomedical waste in Canada.

Environment and Natural Resources (ENR) acknowledge the contributions of CCME in development of the national biomedical waste management guidelines. This guideline for the NWT is based on the CCME Biomedical Waste Guidelines. Structural changes to the CCME document have been made however, and special provisions have been added or certain management options deleted to address the unique conditions of the NWT.

Section 2.2 of the *Environmental Protection Act* (EPA) gives the Minister of Environment and Natural Resources of the Government of the Northwest Territories (GNWT) the authority to develop, coordinate and administer guidelines. This guideline complements existing acts and regulations concerning hazardous waste, which should be consulted for interpretation and application.

This guideline should be read in conjunction with the Guideline for the General Management of Hazardous Waste in the NWT (referred to as the General Guideline) and other applicable specific hazardous waste guidelines. See Appendix C Environmental Legislation WEB Site.

These guidelines apply to, but are not limited to, the following facilities:

- hospitals;
- nursing homes and extended care facilities;
- public health units;
- physicians' offices/clinics;
- dentists' offices/clinics;
- veterinarians' offices/clinics;
- veterinary research, teaching and health care facilities;
- medical research and teaching establishments;
- health care teaching establishments;
- clinical testing or research laboratories;
- facilities involved in the production or testing of vaccines;
- mortuaries and funeral homes;
- coroner's offices;
- nursing offices; and
- blood banks and blood collection centres.

Note: *Although not specifically listed here, other generators and handlers of biomedical waste, such as mobile health care providers, pharmacies and pharmaceutical suppliers, and police, fire, and ambulance services, are encouraged to use these guidelines in formulating their biomedical waste management policies.*

These guidelines recommend minimum practices to be followed in the management of biomedical waste. Health care facilities and Regional Health Boards are strongly encouraged to use these guidelines when formulating their biomedical waste management policies.

1.1 Definitions

<i>Agent</i>	A pathogen that can cause human or animal disease including bacteria, mycoplasma, fungi, viruses and parasites.
<i>Autoclave</i>	A device that uses high-pressure, high temperature steam sterilization for the destruction of bacteria, spores and other infection-causing organisms.

- Biomedical Waste*
- a) **Human Anatomical Waste**
This consists of human tissues, organs, and body parts, but does not include teeth, hair, and nails.
 - b) **Animal Waste**
This consists of all animal tissues, organs, body parts, carcasses, bedding, fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood, and body fluids removed for diagnosis or removed during surgery, treatment or autopsy, unless a trained person has certified that the waste does not contain the viruses and agents listed in Risk Group 4 (see table 1). This excludes teeth, hair, nails, hooves, and feathers.
 - c) **Microbiology Laboratory Waste**
This consists of Laboratory cultures, stocks or specimens of microorganisms, live or attenuated vaccines, human or animal cell cultures used in research, and laboratory material that has come into contact with any of these.
 - d) **Human Blood and Body Fluid waste**
This consists of human fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood, and body fluids removed for diagnosis during surgery, treatment or autopsy. This does not include urine or feces.
 - e) **Waste Sharps**
Waste sharps are clinical and laboratory materials consisting of needles, syringes, blades, or laboratory glass capable of causing punctures or cuts.
 - f) **Cytotoxic Waste**
The term is commonly used to refer to pharmaceuticals used in treating cancer, e.g., antineoplastics or chemotherapy agents.

CCME

Compactor A device employed to reduce the volume of wastes both at the site of generation and during the transportation thereof (e.g. garbage compacting trucks).

Contaminant Any noise, heat, vibration or substance and includes such other substances as the Minister may prescribe that, where discharged into the environment,

- a) endangers the health, safety or welfare of persons,

- b) interferes or is likely to interfere with normal enjoyment of life or property,
- c) endangers the health of animal life, or
- d) causes or is likely to cause damage to plant life or property.

NWT Environmental Protection Act

<i>Decontamination</i>	This is a process that removes microorganisms from an object, rendering it safe for handling.
<i>Disinfection</i>	This is a process that kills most microorganisms but rarely kills all spores. The three levels of disinfection are: low level; intermediate level, and high level. Disinfectants are substances used to disinfect inanimate objects.
<i>Generator</i>	The owner or person in charge, management or control of a hazardous waste at the time it is generated or a facility that generates hazardous waste.
<i>Halogenated</i>	Refers to a type of plastic that contains halogen atoms (elements) such as bromine, chlorine, fluorine, iodine, etc. Combustion of these types of plastic materials results in the generation of acid gases such as hydrogen chloride. Examples of these types of plastics include polyvinyl chloride and fluorocarbon compounds such as Teflon.
<i>Hazardous Waste Management Facility</i>	A facility which is used for the collection, storage, treatment, recycling or disposal of hazardous waste.
<i>Non-halogenated</i>	Refers to a type of plastics that does not contain atoms of halogen elements. Examples include polyethylene, polycarbonate and polystyrene.
<i>Sewage System</i>	A system for the collection, transmission, treatment or disposal of any liquid waste containing animal, vegetable, mineral, human or chemical matter in solution or in suspension. (for purposes of this guideline pump-out systems are excluded as a disposal system for liquids containing untreated biomedical wastes).

Sterilization This is a process that kills all microorganisms, including bacteria, viruses, spores, and fungi.

TDGA/TDGR The *Transportation of Dangerous Goods Act and Regulations* (Canada).

Transport Authority The regulations controlling the management of hazardous waste under that mode of transport. These include:

Road and rail - *Transportation of Dangerous Goods Act* (TDGA) and *Regulations* (TDGR)

Air - *International Air Transport Association Dangerous Goods Regulations* (IATA)

Marine - *International Maritime Dangerous Goods Code* (IMDG).

Although not specifically considered to be biomedical waste, cytotoxic waste must be handled and disposed of carefully. It is therefore included in these guidelines. Cytotoxic agents are considered to be hazardous materials with a toxic effect upon cells. Cytotoxics can cause direct irritant or allergic reactions and may present a hazard due to their mutagenic, carcinogenic, and teratogenic properties.

Biomedical waste does not include waste that is:

- from animal husbandry;
- household in origin;
- controlled in accordance with the Health of Animals Act (Canada), formerly the Animal Disease Act (Canada); or,
- generated in the food production, general building maintenance, and office administration activities of those facilities to which this applies.

Table 1 “Risk Group 4” Agents*

Bacteria	Fungi	Parasites	Viruses
None	None	None	Arenaviridae Lassa fever, Junin, Machupo viruses
			Bunyaviridae Genus Nairovirus Crimean-Congo hemorrhagic fever
			Filoviridae Marburg virus Ebola virus
			Flaviviridae Tickborne encephalitis complex, including - Russian Spring-Summer Encephalitis Kyasanur forest disease virus Omsk hemorrhagic fever virus
			Herpesviridae Alphaherpesvirinae Genus Simplexvirus: Herpes B virus (Monkey B virus)
			Poxviridae Genus Orthopoxvirinae Variola Monkeypox

* Risk Group 4 (high individual risk, high community risk)
A pathogen that usually produces very serious human or animal disease, which is often untreatable and may be readily transmitted from one individual to another, or from animal to human or vice-versa, either directly or indirectly, or by casual contact. (Health and Welfare Canada, 1990).

1.2 Characteristics

Biomedical waste has many forms and is generated by a variety of facilities as listed in the introduction, section 1. Biomedical waste that requires special precautions and handling procedures is:

- a) infectious or potentially infectious;
- b) sharps;
- c) cytotoxic; or
- d) publicly sensitive due to the nature of the waste (i.e., human body parts).

1.3 Principles of Disease Transmission

To understand and appreciate issues concerning the handling and disposing of biomedical waste, the principles of disease transmission must be understood. The segregation of potentially infectious waste from the bulk of the solid waste stream - all of which - could theoretically be considered "potentially infectious material" - is a difficult task. Thus a working knowledge of the way in which infectious agents grow, multiply, and actually induce infection is essential to the development of an effective set of policies.

In order for disease to be transmitted, the following conditions are necessary.

a) Sufficient dose of an infectious agent

For an infectious agent to induce an infection, the infectious agent must be present in quantities sufficient to constitute an infectious dose.

b) Existence of viable infectious agents

With the exception of laboratories or other environments specifically designed for the cultivation of infectious agents, the environment outside the body of humans or animals does not provide conditions suitable for the growth and/or survival of most infectious agents. In general, microbial growth requires very specific temperature, moisture, light, nutrient and pH conditions.

c) A portal of exit

The portal of exit relates primarily to the escape of waste materials during the handling of wastes and can be reduced or eliminated through worker safety programs which include barrier protection and containment procedures.

d) A mode of transmission

Transmission of a disease involves the movement of an infectious agent from a source to the appropriate portal of entry in a susceptible host or individual. The four principal methods of disease transmission are: by physical contact with an infected person (including their secretions, excretions, body fluids, or tissues); through the air; through food and water; and by indirect contact through vectors or other objects. Hand washing is the single most important procedure for preventing nosocomial infections in patients and staff. The ideal frequency of hand washing is unknown, but personnel should wash their hands after handling items contaminated or likely to be contaminated with blood, body fluids, excretions, or secretions; after removing gloves; and in other cases, in accordance with departmental policies.

e) A portal of entry

Barrier protection is an infection control practice that attempts to eliminate routes of infection through the use of gloves, gowns, masks, and other types of personal

protective equipment. The use of such equipment minimizes an individual's risk of exposure to hazardous agents, whether they are physical, chemical, or infectious.

f) A susceptible host

In the context of biomedical waste disposal, assuming proper waste disposal practices, the susceptible host population consists primarily of the waste haulers and handlers. Under normal waste disposal conditions, the general population is not exposed to biomedical waste.

Most waste, whether from a health care facility or the residential setting, simply does not provide either an environment conducive to the growth and survival of infectious agents or the means by which the agent can escape from its source via an infectious mode of transmission.

Infectious and potentially infectious biomedical waste represents only a small percentage of the waste stream generated by medical interventions or the other facilities that generate biomedical waste.

2 Roles and Responsibilities

2.1 Environmental Protection Service

The Environmental Protection Service (EPS) of the Department of Environment and Natural Resources is the Government of the Northwest Territories (GNWT) agency responsible for initiatives which control the discharge of contaminants and their impact on the natural environment. EPS is responsible for ensuring that environmentally acceptable management procedures, emission levels and disposal methods are maintained. By practise the Division's programs are applied primarily to Commissioner's Land, lands administered by municipal governments or GNWT undertakings. Legislative authority is provided by the *Environmental Protection Act* (EPA) and *Pesticide Act*.

EPS monitors the movement of hazardous waste from the generator to final disposal through use of a tracking document called a waste manifest. A waste manifest form must accompany all hazardous waste in transit regardless of the means of transport. In order to complete the manifesting requirements, all parties (the generator, carrier, and receiver) must be registered by EPS and the registration number entered in the appropriate location on the waste manifest form. The General Guideline should be consulted for the approved procedures for hazardous waste management in the NWT. Registration numbers and waste manifest forms are available from EPS.

Under the EPA, the *Spill Contingency Planning and Reporting Regulations* set the standards for reporting spills of contaminants and preparing spill contingency plans.

2.2 Biomedical Waste Generators

Under the *NWT Safety Act* and *General Safety Regulations* employers must provide safe working conditions and inform employees about occupational hazards associated with their duties. Employees also have the right to leave the workplace if faced with unsafe conditions.

The Workplace Hazardous Materials Information System (WHMIS), makes it mandatory that all hazardous substances, including microorganisms, e.g., those used in research or other pursuits, be labelled in a specified manner and that a Material Safety Data Sheet (MSDS) be available to accompany each hazardous substance. Currently, the requirements of WHMIS do not apply to waste materials. All such *Acts* require the employer to provide information, instruction, and supervision to workers to protect their health and safety, and take every reasonable precaution in the circumstances to protect the worker. Employers must provide all training necessary to work with hazardous substances and must keep a written record of their employee education program. More information about WHMIS can be obtained from the GNWT Workers Compensation Board.

2.3 Occupational Health and Safety

General

The *Safety Act* and *General Safety Regulations* require the employer to provide information, instruction, and supervision to workers to protect their health and safety, and take every reasonable precaution in the circumstances to protect the worker.

Policies and Procedures

Workers handling and disposing of biomedical waste are at potential risk of exposure to infection from sharps-related accidents or when containers of waste burst open and leak, or spills of certain waste materials occur. Facilities and organizations responsible for waste handling and disposal should take reasonable steps to reduce the risk of exposure to infection by establishing written policies and procedures based upon the most currently accepted clinical and occupational health and safety information. Workers handling and disposing of biomedical waste should participate in the preparation of these policies and procedures.

Policies and procedures should be reviewed and updated regularly, with compliance to their requirements verified as necessary.

Employee training programs must emphasize the following:

- personal hygiene, especially washing hands;
- the facility's procedures for the reduction, segregation, collection, packaging, colour-coding, labelling, storage, and in-house movement of waste;
- methods for preventing the transmission of infections related to waste-handling procedures;
- the hazards of those materials to which workers may be exposed; and
- the actions to be taken and which supervisory staff should be notified in the event of an accident.

Employee training programs should be continually assessed and reinforced, and their content periodically reviewed and updated as necessary. Consideration should be given to adapting the training programs to suit personnel who may not be fluent in the official language of predominant use or who may not be fully literate.

To minimize the occupational health risks associated with the handling and disposal of biomedical waste, occupational health care programs should:

- include a regular assessment of waste management procedures to assure compliance with applicable standards and all applicable federal, territorial and municipal regulations and legislation;
- provide appropriate personal protective equipment and hand washing facilities for workers involved in various stages of waste handling and disposal;
- include a written procedure to handle and report needlestick injuries and other waste-handling incidents. Injuries caused by needlesticks and sharp instruments should be documented, reviewed, and changes implemented to prevent similar incidents in the future;
- emphasize the need for point of generation segregation so that waste is placed within an appropriate waste container;
- review the type and quality of waste containers used and, if necessary, have them upgraded to containers considered to be more suitable;
- review handling practices to determine if problems are the result of excessive or inappropriate handling. If so, modify the handling techniques; and

- consult with employees being affected by inappropriate handling techniques and invite their participation in determining effective solutions.

Waste haulers and handlers should always be appropriately clothed and wear personal protective equipment so that harmful agents, whether physical, chemical, or infectious, are prevented from gaining access to open wounds, cuts, or by absorption through the skin. Personal protective equipment may include gloves, gowns, safety glasses, protective footwear, etc..

2.4 Immunization

A course of Hepatitis B (HBV) vaccine should be offered to all employees responsible for handling and disposing of biomedical waste who are at risk of exposure to human blood, blood products, or body secretions. These employees should also be up-to-date for tetanus, diphtheria, and polio. While polio boosters may not be necessary, 10-year boosters for tetanus and diphtheria, at least are recommended. (Health and Welfare Canada, 1989).

In facilities where employees are in contact with animals and their wastes, employees should be offered rabies vaccine if the animals have had a reasonable chance of contacting the rabies virus. For example, rodents kept in a colony situation have no chance of exposure to rabies and thus employees do not require rabies protection in order to safely handle these animals.

2.5 Special Precautions for Sharps

Note: *Exposure to a needle or other sharp object contaminated with the blood of an infectious person presents the greatest potential risk for transmission of HBV, HIV, and other blood borne pathogens to the health-care worker and waste handler.*

Sharps pose a dual hazard: transmission of infection by inoculation and physical injury. They must be contained and handled properly. Sharps must be contained in puncture-resistant containers meeting the requirements outlined in Subsection 3.4.2.

Two-handed recapping of needles must be avoided. Many safe recapping methods and devices are available. If such devices are used, they must be reliable and readily available, and appropriate education must be provided concerning their use.

Note: *Most needlestick injuries occur during recapping. This recommendation recognizes that, under some circumstances, it is necessary for needles to be recapped, e.g., when medication mixtures are drawn and when multiple injections for the same patient are required. This recommendation also*

recognizes that devices and methods for safe recapping of needles continue to be developed and therefore does not restrict their development and use.

Needles must not be clipped, bent, or broken before disposal.

Health care facilities must carefully analyze their use of sharps. Despite employee education programs regarding the safe handling and disposal of sharps, needlestick injuries do occur. As a result, health care facilities should establish surveillance programs to identify and analyze needlestick injuries and develop a strategy for preventing such injuries.

Notes: (1) *Surveillance programs may lead to the development of more effective safety measures and to better educational strategies. Employees should be encouraged to participate in preparing and promoting these strategies.*

(2) *As part of a preventive strategy, sharps containers may be attached to medication carts and placed in convenient locations, particularly in preparation and cleanup areas in wards and laboratories. Point-of-use sharps disposal systems may also be useful, but should be assessed on a case-by-case basis, as they may not be appropriate in all situations.*

2.6 Special Precautions for Incinerator Operators

Staff responsible for loading and cleaning out incinerators should wear appropriate protective equipment, including dust masks, heavy gloves and safety shoes with puncture-proof toes and soles to avoid injury. Protective eyewear should also be worn, as glass that has melted and stuck to the incinerator refractory may shatter when struck by a shovel being used to remove ash.

Note: *Although ash from biomedical waste incinerators does not contain viable microorganisms, it may contain a significant quantity of sharps, such as needles and glass which may not be fully destroyed in the burning process, and may thus still pose a physical hazard to persons who clean out incinerator ash and residues.*

2.7 Accidental Exposure to Human Blood and Body Fluids

Health care facilities should develop policies and procedures for following up on employees who sustain a puncture wound from a used sharp. This information must be available in the occupational health service manual and the infection control manual, and be readily accessible to all appropriate staff. It should include procedures to protect and/or follow up with the employee possibly exposed to tetanus, Hepatitis B, Hepatitis C, and HIV.

Health care facilities should ensure that a mechanism exists for following up on employees who suffer a puncture wound when the occupational health nurse is unavailable, or where an occupational health service does not exist. Staff charged with this responsibility must understand and have access to the policies and procedures at all hours.

In preparing these policies and procedures, consideration must be given to incorporating the most current recommendations of sources such as the National Advisory Committee on Immunization, and Health and Welfare Canada.

2.8 Spills

General

In spite of every possible effort to avoid the escape of waste materials during movement within the health care facility, spills may occur. In most instances, minor spills involving loss or aerosolization of small volumes of material are most likely the result of faulty transfer techniques. Major spills or accidents usually involve container rupture, caused by equipment malfunction or careless handling.

Facilities handling and disposing of biomedical waste should have a documented policy and procedure for managing the spill of such waste. The procedure for managing a spill should include the following.

- a) All staff should be trained and educated in managing biomedical waste and recognizing and managing a spill condition.
- b) A method should be prepared for containing and isolating each type of spill.
- c) Should a spill occur, staff designated for spill cleanup should be notified immediately.
- d) Information about individual substances and their cleanup should be readily available to all staff on a 24-hour basis.
- e) Proper equipment and supplies should be available for cleaning up spills and protecting employees.
- f) The procedures for each type of spill should be documented and made available in areas where spills are likely to occur.
- g) Procedures should be documented for the proper disposal of waste according to the facility's biomedical waste management program.

- h) All incidents should be documented for the purpose of record keeping.
- i) Any employee exposed to a spill should be treated and monitored by the Occupational Health Services Unit of the facility or their family physician.
- j) If necessary, evacuation and internal contingency plans must be implemented.

In general, spills that cannot be readily contained should be covered with an appropriate absorbent material. This material should be available as part of any spill kit.

Under the authority of the Environmental Protection Act the Spill Contingency Planning and Reporting Regulations require spill contingency planning and reporting of spills. The regulations are available at the following WEB address:
<http://www.gov.nt.ca/ENR/eps/leg.htm>.

Human Blood and Blood-contaminated Fluids

Spills of human blood and blood-contaminated fluids should be promptly cleaned up by the following method *while wearing gloves*.

- a) Visible material should first be removed with disposable towels or other appropriate means that prevents direct contact with blood. If splashing is anticipated, both protective eyewear and clothing should be worn.
- b) The area should then be decontaminated with an appropriate germicide as recommended by the facility's infection control committee, biosafety officer, or other appointed person(s). Chemical germicides that are approved for use as "hospital disinfectants" and are tuberculocidal when used at recommended dilutions can be used.
- c) Hands should be washed after gloves are removed.
- d) Soiled cleaning equipment should be cleaned and decontaminated or placed in an appropriate container for disposal. Plastic waste-holding bags should be available for removing contaminated items from the site of the spill.
- e) Shoes and boots can sometimes become contaminated with blood. If there is massive blood contamination on floors, the use of disposable, impervious shoe coverings should be considered. Protective gloves should be worn to remove contaminated shoe coverings. The coverings and gloves should be placed in plastic waste-holding bags and disposed of as contaminated materials.

3 Biomedical Waste Management Program

3.1 General

A written biomedical waste management program must be included in a health care facility's policy and procedure manuals. It must also be included in the facility's in-house education, occupational health and safety, and orientation programs for all employees. This program must be regularly reviewed and updated by an appropriate review committee, which includes waste handlers as members.

Note: *The programs of individual health care facilities will vary depending on such factors as: the nature and quantity of the waste generated, the availability of equipment for treatment, on-site or off-site; the regulatory requirements applicable to the particular facility; and, the costs of waste handling and disposal.*

The health care facility must appoint a person or persons to be responsible for the biomedical waste management program. This person or persons must have suitable training and experience, relating to waste management, occupational health and safety, infection control, etc., and be aware of the hazards associated with managing biomedical waste.

Policies and procedures should be made available and include the following:

- a) strategies for minimizing the quantities of biomedical waste generated and disposed of;
- b) methods of segregating, packaging, labelling, moving, storing, treating, and transporting the various waste types (both on- and off-site, as appropriate);
- c) methods for keeping records of the quantities of biomedical waste generated, treated, and disposed of;
- d) a list of all regulations and legislation concerning biomedical waste that are applicable in the NWT;
- e) a list of those responsible for managing biomedical waste in the event of an accident or spill; and
- f) provision for regular, ongoing staff instruction about proper handling and potential hazards of biomedical waste.

Certain basic elements must be embodied in any biomedical waste management program to ensure that biomedical waste is handled and disposed of safely and efficiently.

Health care facilities must prepare contingency plans for dealing with: the storage of refrigerated or frozen biomedical waste, if excess waste is produced; disposal facilities or equipment becoming inoperative; refrigeration or freezing facilities or equipment becoming inoperative; and the disposal of biomedical waste if disposal services are disrupted.

The effectiveness of waste disposal policies and procedures should be assessed regularly.

The assessment process should be described in the policy and procedure manuals and should reflect the quality assurance requirements used in other areas of facility management.

3.2 Reduction

The recommendations in this subsection go beyond biomedical waste and touch on other aspects of waste management in health care facilities. The principles stated herein should be applied as broadly as possible to all aspects of waste reduction.

Comprehensive waste reduction principles must be reflected in the health care facility's biomedical waste management program.

Notes: (1) *Implementing waste reduction strategies leads to a source-reduction approach to waste management whereby the creation of waste is avoided and its by-products are recycled as much as possible.*

(2) *In order to operate efficiently, source separation and other innovations in waste handling may require designated and appropriately designed spaces. These needs should be considered when health care facilities are being designed or renovated.*

Waste management needs must be considered when planning to purchase new products or to change operational procedures, e.g., quantity and type of waste produced, disposal costs, disposal method, etc.

Waste audits should be conducted regularly to identify sources and types of waste that the health care facility generates, with a view to determining options for waste reduction.

Notes: (1) *Waste audits serve to: define sources, quantities, and types of waste generated, highlight efficiencies and inefficiencies in waste management, identify aspects of waste management requiring improvement or alteration;*

help set targets for waste reduction; and increase employee knowledge of, and concern for, waste management.

- (2) *Factors to be considered when undertaking a waste audit include identifying: those waste generators to be included in the audit, the services they provide; the types of medical and surgical supplies used, including the amount of disposable products being used, the types and volumes of waste generated, the potential for source reduction and product substitution; and the waste treatment and disposal practices followed.*

Recently, the reduction of waste from health care facilities has focused on the potential replacement of medical and surgical supplies with reusable supplies. Where possible, and consistent with patient safety, replacing single-use/disposable items with reusable products should be considered. While this may be one component of a waste reduction program, product substitution, reduced product packaging and recovering materials that can be reused or recycled should also be considered.

When products are being assessed, preference should be given to those products that are reusable, contain recycled material, or are themselves recyclable. Consideration should be given to the costs associated with product disposal and to minimizing the amount of packaging associated with the product.

Note: *While product packaging is not a biomedical waste, if not properly segregated, it may require special handling and disposal.*

If possible, products purchased by health care facilities should bear the "EcoLogo" symbol shown in Figure 1. This is the symbol of the Environmental Choice Program, administered by Environment Canada. This program helps consumers to identify products that maximize energy efficiency and the use of recycled or recyclable materials, and minimize the use of environmentally hazardous substances. After independent third party testing, products found to comply with the product-specific guidelines are considered environmentally responsible and can display the EcoLogo.



Figure 1 The Environmental Choice Program's EcoLogo

For further information regarding the program and approved products, contact:

Environmental Choice Program
107 Sparks Street, 2nd Floor
Ottawa, Ontario
K1A 0H3

3.3 Segregation

Whether the method of disposal is on-site or off-site, biomedical waste must be segregated from the general waste stream. If biomedical waste is mixed with general refuse, the total waste stream would require special treatment and handling. Waste segregation relies on the waste being segregated at its point of generation and placed into appropriate waste containers. Segregation permits facilities to effectively divert those materials that are recyclable, require special handling or disposal.

Biomedical waste must be segregated at the point of generation into the following waste categories: human anatomical waste; animal waste; microbiology laboratory waste; human blood and body fluid waste; and waste sharps. These types of waste are defined in Subsection 1.1.

Although not considered a biomedical waste, cytotoxic wastes and pharmaceutical wastes must also be segregated from the remainder of the waste stream.

3.4 Packaging

Waste must be safely contained during handling and to the point of its disposal. The packaging must remain intact throughout handling, storage, transportation, and treatment.

When selecting packaging, the following factors should be considered: the type of waste being contained; appropriate colour-coding and labelling (see Subsection 3.5); special transportation requirements; the method of disposal; transport requirements; and requirements of the disposal facility.

To simplify their selection and use, waste containers should be classified as reusable or single-use/disposable.

Packaging suppliers for biomedical wastes are provided in Appendix B.

3.4.1 Reusable Containers

Reusable waste containers must be made of metal or rigid plastic and able to withstand exposure to common cleaning agents. They must be colour-coded according to the type of waste for which they are intended (see Subsection 3.5); and labelled with the biohazard symbol (Figure 2).

Reusable waste containers should be inspected for holes or leaks each time they are emptied and their colour coding and labelling renewed if necessary. Holes or leaks must be repaired or the waste container replaced.

Reusable waste containers must be cleaned regularly to prevent odours and as soon as possible if waste materials leak or spill within the containers.



Figure 2 Biohazard Symbol

The facility's infection control committee, biosafety officer, or other appointed person(s) should be consulted about the frequency of cleaning and the type of cleaning agent to be used.

3.4.2 Single-use Containers

Single-use waste containers should be classified as one of the following types: sharps container; waste-holding plastic bag; or cardboard container.

Sharps Containers - The critical characteristic of any sharps container is that it be sturdy enough to resist puncture under conditions of use and to the point of disposal. Until a method is devised to determine this objectively, sharps containers should be tested and evaluated under actual conditions of use.

Sharps containers must also be colour-coded yellow and labelled with the biohazard symbol (see Subsection 3.4.1 and Figure 2); have lids that can be tightly secured; and if used for containing cytotoxic wastes, the cytotoxic hazard symbol (Figure 3) must be displayed clearly and visibly.

It may also be useful to users if sharps containers have: a fill line; features permitting simplified movement and handling of filled containers before disposal; means by which unauthorized individuals are prevented from removing items from the container or from removing the container itself; a design that allows stacking, to decrease storage space; and features that allow the sharps container to be attached to medication and/or treatment carts.



Figure 3 Cytotoxic Hazard Symbol

Note: *If sharps containers are to be autoclaved before disposal, they must remain functionally intact at high autoclaving temperatures.*

Sharps containers should be conveniently located close to the point of disposal to reduce the likelihood of injury from sharps being carried significant distances for the purpose of disposal. Sharps containers should not be filled to more than three-quarters of their usable volume in order to prevent injuries due to overfilling. Sharps should never be forcibly pushed into the container.

Staff responsible for collecting and replacing sharps containers should be trained in proper handling methods.

During use, sharps containers should not be filled or partially filled with liquid disinfectant solution.

Note: *Although this practice is intended to decontaminate sharps as they are placed into the container, it has the following problems:*

- *the solution rarely has the required contact with all items placed within the container, resulting in a failure to achieve the degree of decontamination intended,*
- *the liquid in the container presents a spill hazard if the container is knocked over, and,*

- *before disposal, the liquid is usually decanted, presenting an unnecessary opportunity for staff contact with aerosols and sharps.*

The use of second-hand containers, e.g., bleach and germicide bottles, for containing sharps must be formally approved by the person(s) responsible for the facility's biomedical waste management program. Such containers are only acceptable if they meet the requirements outlined in this subsection. The random, unsupervised use of second-hand sharps containers is unacceptable.

Plastic Waste-holding Bags

The critical characteristic of any plastic waste-holding bag is that it be sturdy enough to resist puncture under conditions of use and to the point of disposal. Each facility should fully test and evaluate their bags under actual conditions of use colour coded and labelled with the biohazard symbol.

Note: *For the purposes of in-house collection and movement of waste, it is inappropriate to specify a minimum thickness of plastic bags or plastic sharps containers as plastic materials vary extensively in their physical and mechanical properties. A 25 μm thick film of one plastic material may be more resistant to puncture, impact, and abrasion than a 50 μm thick film of a different plastic material. The manufacturing process, i.e., extrusion versus injection moulding, can further affect these properties.*

Plastic waste-holding bags must also be colour-coded (see Subsection 3.5) and labelled or identified according to the biomedical waste management committee policy.

Cardboard Containers

Cardboard containers must be: colour-coded and labelled with the biohazard symbol (see Subsection 3.5 and Figure 2); rigid; closable; leak-resistant; and capable of being sealed.

Notes: (1) *The use of cardboard containers that contain recycled fibres is encouraged.*

(2) *If cardboard containers are to be shipped off-site and are not to be supplemented with an additional outer packaging meeting the requirements of the Transportation of Dangerous Goods Regulations, then the cardboard container itself must meet the requirements of the Regulations. SEE SECTION ON TDGR.*

3.5 Colour-coding and Labelling

Containers for biomedical waste must be colour-coded as shown in Table 2 and labelled with the biohazard symbol (Figure 2). This must be implemented as part of each health care facility's biomedical waste management program.

Table 2 Colour-coding of Waste Containers by Waste Type

Waste Type	Colour-coding
Human Anatomical	RED
Animal Waste	ORANGE
Microbiology Laboratory Waste	YELLOW
Human Blood and Body Fluid Waste (if applicable)	YELLOW
Waste Sharps	YELLOW

Note: *Segregation and colour coding of the various types of waste is vital to ensure that the wastes are handled and disposed of properly.*

Containers for biomedical waste must be colour-coded by: dyeing the entire container in the appropriate colour; encircling the outer surface of the container with a band of colour not less than 50 mm wide; or other methods to ensure staff recognition.

If a sharps container is mounted in a cabinet or some other type of holder, only the actual sharps container must be colour-coded and labelled with the biohazard and cytotoxic symbols, as appropriate. The outer cabinet or holder must, however, be labelled as containing sharps, using the words "CAUTION: WASTE SHARPS", or an equivalent.

Note: *For animal waste, the requirements of the Health of Animals Act (Canada), formerly the Canada Animal Disease Protection Act (Canada), as well as any relevant territorial regulations and legislation, must be followed. Under the Act, which is administered by Agriculture Canada, communicable disease is defined as any disease that is infectious or contagious. This Act gives a veterinary inspector the power to order persons having possession, care or custody of an animal that dies and is suspected of having died of a communicable disease or is destroyed because of infection by such disease, to dispose of the carcass in such a manner as the veterinary inspector specifies.*

3.6 In-house Movement of Wastes

The handling and transport of waste containers should be minimized to reduce the likelihood of exposure to the waste.

Note: *From their point of generation, wastes need to be moved within the facility to storage areas to await disposal. Wastes should be moved through the facility in such a manner as to prevent unnecessary exposure to staff and others.*

Careful selection of waste containers greatly reduces the likelihood of breakage and leakage during use. In anticipation of such accidents occurring, however, a material-handling system should be devised to minimize the possibility of inadvertent exposure by limiting the amount of handling. Specific routes must be planned through the facility to minimize the passage of loaded carts through patient care and other clean areas.

To minimize the possibility of waste handlers incurring injuries while handling filled waste containers, the facility's health and safety committee, biomedical waste management committee or other appointed person(s) should establish size and weight criteria for the waste loads.

Carts used for moving biomedical waste through the health care facility should be designed to prevent spills, and made of materials able to withstand exposure to common cleaning agents. The biohazard symbol should be clearly displayed on these carts (Figure 2).

These carts must be thoroughly cleaned before any maintenance work is performed on them. They should be cleaned regularly to prevent odours and as soon as possible if waste materials leak or spill in the carts.

The facility's infection control committee, biosafety officer, or other appointed person(s) should be consulted about the frequency of cleaning and the type of cleaning agent to be used.

4 Treatment Options for Biomedical Waste

The appropriate treatment options for the different types of biomedical waste are summarized in Table 3.

Table 3 Treatment Options for Biomedical Waste

Waste Type	Steam Autoclaving	Chemical Decontamination	New Technology
Human - Anatomical Waste	No	No	ENR Approval Required
Animal Waste - Anatomical	No	No	ENR Approval Required
- Non-anatomical	Yes*	No	ENR Approval Required
Microbiology Laboratory Waste	Yes	Yes**	ENR Approval Required

Table 3 (continued)

Waste Type	Steam Autoclaving	Chemical Decontamination	New Technology
Human Blood and Body Fluid Waste	Yes	Yes**	ENR Approval Required
Waste Sharps	Yes*	Yes*	Isolyser Sharps Management System

- * Only if followed by incineration under strict control. Chemical treatment alone does not render sharps safe for additional handling. This treatment option applies to filled sharps containers that may undergo further treatment after chemical decontamination, as part of a process, e.g., chemical decontamination coupled with mechanical shredding or incineration.
- ** Chemical decontamination solutions require pH buffering prior to discharge to holding tank or sanitary sewer. The discharge pH range is 6.5-10.5.

4.1 Steam Autoclaving

Steam autoclaving is an appropriate method for treating microbiology laboratory waste, human blood and body fluid waste (if applicable), waste sharps, and non-anatomical animal wastes. It must not be used for treating either human or animal anatomical waste.

Personnel who operate steam autoclaves must be thoroughly trained in the use of the equipment.

The effectiveness of decontamination of biomedical waste is dependent upon the temperature to which the waste is subjected as well as the length of time it is exposed to steam. Because the waste is heated by both steam penetration and heat conduction, all air must be displaced and containers holding the waste must have good steam permeability.

Notes: (1) *Typical operating conditions for decontamination are a temperature of at least 121°C at a pressure of 105 kPa (15 lbs/in²) for more than 60 minutes.*

(2) *Laboratory wastes, such as Petri dishes and syringes that are liable to melt and trap air or liquids, may require longer sterilization times.*

The penetration of steam into the waste is crucial to the effectiveness of the autoclaving process. For this reason, particular attention must be given to packaging to ensure effective steam penetration.

Special consideration must be given to the type of plastic bags used within the autoclave. Some bags impede steam penetration while others may melt during the autoclave cycle. Plastic bags should therefore be assessed under actual working conditions to assure their effectiveness and integrity throughout the autoclave cycle.

The effectiveness of decontamination is also affected by the volume and size of the waste load in the autoclave. For small-capacity laboratory autoclaves, two separate small loads may be more effective for treatment than a single larger load. Also, since there is no "standard load" for an autoclave, the operator may need to adjust to the autoclaving parameters. As with other treatment technologies, proper operation of the autoclave is essential to its effectiveness.

To monitor the effectiveness of the autoclaving cycle, either chemical indicators or biological indicators are typically used. Chemical indicators are not recommended, however, as they indicate only the attainment of a temperature, not its duration. Biological indicators, such as the presence of *Bacillus stearothermophilus*, are typically found to be more reliable. The effectiveness of the autoclave should be verified regularly, based on its frequency of use.

The facility should keep records of the time, temperature, and pressure to which each load of decontaminated waste is subjected as evidence that the load has been treated. Records must also be kept of routine preventative maintenance and problem maintenance for the steam autoclave. These records must be available at all times.

Wastes containing cytotoxic agents, such as chemotherapy drugs and other chemical wastes, must not be subjected to autoclaving. Such wastes are not degraded at normal autoclave temperatures.

Organic wastes containing oxidizing agents like sodium hypochlorite or solvents should not be autoclaved due to the potential for explosion.

4.2 Chemical Decontamination

Chemical decontamination (utilizing trained personnel) is appropriate for treating microbiology laboratory waste, human blood and body fluid waste. It must not be used for treating anatomical waste. Waste sharps may be chemically decontaminated however, the sharps may not be completely sterilized unless mechanical shredding is involved. Shredding should only be done where the shredder is integral to an incinerator, which is sealed to prevent any release. Direct incineration is the preferred disposal method for waste sharps.

Notes: (1) *Chemical decontamination is most often applied to liquid wastes before disposal. It may be useful in decontaminating spills when they occur.*

(2) *Chemical treatment alone does not render sharps safe for additional handling. This treatment option applies to filled sharps containers that may under go further treatment after chemical decontamination as part of a*

process, e.g., chemical decontamination coupled with mechanical shredding direct to incineration.

If chemical decontamination is used, the following factors should be considered: type of microorganism; degree of contamination; type of disinfectant used; and concentration and quantity of disinfectant. Other relevant factors include temperature, pH, degree of mixing, and the length of time the disinfectant is in contact with the contaminated waste.

Sodium hypochlorite (household bleach) is often used as an intermediate-level disinfectant, with the undiluted commercial product normally being a 5.25% solution of sodium hypochlorite (50 000 mg/L of free available chlorine). If a diluted hypochlorite solution is used, it should be made up daily to prevent loss of germicidal action.

Note: *A 5000 mg/L (5000 ppm) sodium hypochlorite solution (1:10 dilution) is recommended for disinfecting blood spills and soiled equipment.*

Records of the chemical decontamination protocol to which each load of waste was subjected should be kept by the facility as evidence that the load has been treated.

The disposal of chemical decontaminated waste must comply with Treatment Options (Table 3) and Disposal Options for Untreated Biomedical Waste (Table 4). If wastes are disposed of in a sewer, municipal approval must be obtained.

4.3 New Technology

Innovative, new techniques may be used for treating biomedical waste, subject to the approval of the Department of Environment and Natural Resources and possibly the municipal authority.

The Isolyser SMS (Sharps Management System) has been approved (1997) for sharps management at health facilities and home care settings in communities without a hospital incinerator.

5 Storage of Biomedical Waste

After biomedical waste has been collected and moved from its point of generation, it may be held in storage areas to await disposal. These storage areas must be totally enclosed, and separate from supply rooms or food preparation areas. They must be lockable and access must be restricted to authorized personnel. Storage areas must be identified as containing biomedical waste, with the biohazard symbol clearly displayed. It is unacceptable for materials other than waste to be placed in the same storage area as biomedical waste.

Floors, walls, and ceilings of storage areas must be thoroughly cleaned in accordance with the facility's established procedures. These procedures should be prepared in consultation with the facility's infection control committee, biosafety officer, or other appointed person(s).

Anatomical wastes must be stored at 4°C or lower. All biomedical waste must be refrigerated at 4°C or lower if stored for more than four days. Health care facilities should determine the maximum storage time of refrigerated or frozen biomedical waste based upon its storage capacity and rate of waste generation.

Facilities refrigerating or freezing stored waste should use a lockable, closed cold storage facility or a lockable, domestic type freezer unit. Either type must be used only for storing biomedical waste, visibly display the biohazard symbol, and be identified as containing biomedical waste.

If the health care facility generates only waste sharps, waste storage areas need not be refrigerated.

Note: *While both refrigeration and freezing serve to reduce the rate of microbial growth and putrefaction, caution should be exercised when freezing waste containing glass or plastic items that may contain infectious agents, e.g., culture tubes. Such glass or plastic items may fracture at lowered temperatures.*

Contingency plans must be prepared for storing refrigerated biomedical waste if excess waste is produced, or if either refrigeration or disposal facilities or equipment become inoperative.

The compaction or shredding of untreated biomedical waste is not permitted unless the compactor or shredder is an integral part of the incinerator and completely sealed.

Note: *The compaction or shredding of biomedical waste is potentially hazardous to staff as containers could burst or leak and sharps could protrude through containers. Furthermore, compaction of untreated biomedical waste may also aerosolize infectious agents.*

Note: *Storage of biomedical wastes longer than 180 days requires registration as a hazardous waste storage facility by EPS. See the General Guideline section 3.4.*

6 Transportation of Biomedical Waste

General

The handling, offering for transport and transport of biomedical waste must comply with the requirements of the *Transportation of Dangerous Goods Act and Regulations* or requirements of the Transport Authority. Biomedical waste Generators, Carriers and Receivers must be registered by EPS and transport of biomedical waste, regardless of the mode of transport, must be documented using a Hazardous Waste Manifest. Registration numbers and waste manifest forms are available from EPS. Packaging containers must meet strict requirements for all modes of transport. TDGR and ICAO packaging suppliers are provided in Appendix B.

The General Guideline should be consulted for the specific requirements of the Generator, Carrier and Receiver. If infectious or potentially infectious wastes are shipped to a registered receiver communication between the shipper and receiver is required.

6.1 Emergency Response Plan

If infectious substances, affecting humans only, (Risk Group IV) or infectious substances, affecting animals only, (Risk Group IV), are to be transported any where in or through Canada an Emergency Response Plan (ERP) must be prepared and provided to the Director General of the Transport of Dangerous Goods Directorate, Contact address for the Director General follows:

Director General of the Transport of Dangerous Goods Directorate
Transport Canada
Canada Building 344 Slater Street, 14th Floor
Ottawa, Ontario K1A 0N5
Phone: (613) 992-4624, Fax: (613) 993-5925

6.2 Driver Training

Drivers of vehicles transporting biomedical waste must be trained by their employers and issued a certificate of training. Training must be updated as required by the appropriate transport authority. Road transport training is valid for three years, air transport training is valid for two years.

This training must cover the following areas:

- a) operation and basic maintenance of all vehicles and equipment the driver may use;

- b) proper loading, unloading, and cleaning procedures;
- c) relevant transport legislation, such as requirements for packaging, classification, safety marks, documentation, dangerous occurrence reporting vehicle requirements, use of safety equipment, etc..
- d) the nature and characteristics of the waste, including personal and community health risks;
- e) emergency response procedures, including what to do in the event of an accident or spill, and the operation and purpose of any emergency equipment assigned to the vehicle.
- f) the requirements of the *Spill Contingency Planning And Reporting Regulations*
- g) other considerations specific to the type of biomedical waste being transported.

The driver must carry the certificate of training while operating a vehicle transporting biomedical waste. Anyone who has not received a certificate of training must not operate a biomedical waste transportation vehicle unless under the direct supervision of a trained driver. A sample certificate of training is provided in Appendix C.

6.3 Biomedical Waste Carrier

Carriers of biomedical waste are required to be registered by EPS as a Hazardous Waste Carrier before the waste can be transported to a disposal facility. Carrier responsibilities, registration and documentation procedures are outlined in the General Guideline.

6.4 Vehicle Requirements

The requirements for vehicle roadworthiness and licensing are available by contacting Motor Carrier Services, Department of Transportation as listed in the General Guideline.

Vehicles used to transport biomedical waste must not be used to transport mixed cargoes of wastes and other goods, including food or other goods for human consumption.

The storage compartment should be locked at all times that the biomedical waste transportation vehicle is being operated or contains any waste.

The storage compartment must be refrigerated if the period of time between generation and disposal of the biomedical waste exceeds four days. This applies when biomedical

waste must be transported over long distances. If refrigerated, the storage compartment should be insulated and maintained at 4°C or less while it contains waste or the vehicle is being operated.

The storage compartment must be cleaned regularly with an approved disinfectant to prevent odours and as soon as possible if waste materials leak or spill within the compartment.

6.5 Preparation for Transport

Before transferring a shipment of biomedical waste to the carrier, the health care facility (consignor) must ensure that the carrier is registered with EPS and that the intended consignee is authorized to dispose of biomedical waste.

All biomedical waste packaging and labelling must comply with the applicable packaging requirements of the *Transportation of Dangerous Goods Regulations* or other Transport Authority.

All outer containers for biomedical waste must be colour-coded according to the type of waste contained (see Subsection 3.5). The biohazard symbol must be affixed to the outer surface of the container in such a way that it is clearly visible and legible. The biohazard symbol must not be placed on the side upon which the container is intended to rest.

6.6 Manifests

Generators of biomedical waste using transport services must meet the manifest requirements of the *Transportation of Dangerous Goods Regulations*. Manifest requirements are provided in the General Guideline section 3.

When a shipment of biomedical waste arrives at the disposal site, the consignee (Registered Hazardous Waste Receiver) must inspect it to ensure that there are no discrepancies in the manifest.

Shipping names for biomedical waste, as required under the *Transportation of Dangerous Goods Regulations*, are listed in Appendix A.

6.7 Rejected Shipments

When a shipment arrives at the consignee facility and something is found to be wrong with it, such as a manifest discrepancy or damaged or unsafe package, the consignee may refuse the shipment. In this case, the carrier should immediately contact EPS and the consignor of the shipment and attempt to settle the discrepancy.

6.8 Emergency Reporting

If an accident or spill occurs during the transportation of biomedical waste, the person responsible for the waste at that time must contact the Spill Report Centre at (867) 920-8130 and the local Environmental Health Officer.

The accident report must include:

- a) the time and place of the accident or spill;
- b) the name and phone number of the person reporting the incident;
- c) the type and amount of material spilled;
- d) a brief description of what happened and the status of the situation at the time of the report;
- e) what has been done by the person reporting to correct the situation; and
- f) the name of the consignor.

If the waste involved in a spill contains Risk Group IV infectious agents affecting humans or animals (which requires an Emergency Response Plan to be filed with the Director General Transport Canada) the Canadian Transport Emergency Centre better known as "CANUTEC" must be contacted to implement the ERP. CANUTEC Emergency number is (613) 996-6666, Fax (613) 954-5101, information (613) 992-4624 or (CANUTEC@tc.gc.ca).

The carrier must submit a written report detailing all aspects of the incident if requested by the provincial or territorial authority or by Transport Canada.

7 Disposal of Biomedical Waste

Disposal options for the different types of untreated biomedical waste in the NWT are summarized in Table 4.

Table 4 Disposal Options for Untreated Biomedical Waste

Waste Type	Landfill	Sanitary Sewer	Incinerator	New Technology
Human Anatomical Waste	No	No	Yes	ENR / Municipal Approval Required
Animal Waste	No	No	Yes	ENR / Municipal Approval Required
Microbiology Laboratory Waste	No	Yes*	Yes	ENR / Municipal Approval Required
Human Blood and Body Fluids	No	Yes*	Yes	ENR / Municipal Approval Required
Waste Sharps	No**	No	Yes	Isolyser sharps system approved; (landfill)
Cytotoxic Waste	No	No	Yes	ENR / Municipal Approval Required

* Microbiology laboratory waste, human blood and body fluids can be disposed of in this way if they are first decontaminated by an approved treatment process acceptable to EPS (autoclave, chemical decontamination) and approved by the municipality. Also, chemical solutions resultant from chemical decontamination must be buffered to ensure a pH of 6.5-10.5 prior to discharge to sanitary sewer.

** Sharps may be treated using an approved decontamination/stabilization/solidification system. The Isolyser sharps management system is approved for use and landfill disposal in the NWT.

Note: *For religious or ethical reasons, human anatomical wastes may in certain situations be buried at a cemetery.*

7.1 Sanitary Sewer

The piped sanitary sewer system is an acceptable method of disposal for treated fluid blood, suctioned fluids, excretions and secretions. However, many NWT communities manage gray water and sewage by holding tank storage and truck pump-out. Therefore, only treated wastes are allowed into the trucked sewage collection system in the NWT. Also, the municipality should be contacted to ensure that disposal of treated biomedical waste is acceptable and that the community workers have been advised and trained to manage the system containing treated wastes.

Fluids associated with the six exotic communicable diseases (ECDS) listed by Health and Welfare Canada requires special handling. These diseases are:

- Lassa fever;
- Marburg virus disease;
- Ebola virus disease;
- the two South American hemorrhagic fevers - Junin and Machupo; and the
- Crimean-Congo hemorrhagic fever.

Because of the potential infectivity of the agents causing these diseases, and their relatively high case-fatality rates, wastes contaminated by these diseases should be managed in consultation with the Laboratory Centre for Disease Control, Health and Welfare Canada (Health and Welfare, 1988 to 1991).

Microbiology laboratory waste consisting of:

- laboratory cultures;
- stocks or specimens of microorganisms;
- live or attenuated vaccines;
- human or animal cell cultures used in research; and
- laboratory material that has come into contact with the above.

These must be autoclaved or chemically decontaminated as appropriate before disposal to the sanitary sewer system.

Solid wastes must not be ground and then flushed into the sanitary sewer as aerosol can be produced and sewer lines may become clogged.

Liquid wastes, if they are not being disposed to a sanitary sewer after appropriate treatment, should be placed in leak-proof containers before treatment and disposal. Liquid wastes must not be disposed to landfill, as NWT landfills are not designed to accept waste liquids.

7.2 Incineration

In Table 5, stack discharge limits are given for all biomedical waste incinerators regardless of capacity. It has been shown that maintaining emission concentrations within these limits for the selected contaminants should result in low emissions for a number of other contaminants.

Table 5 Stack Discharge Limits (@ 11 % O₂) For New or Existing Incinerators

Contaminant	Limit	Monitoring Method/ Averaging Time
Particulate Matter	20 mg/Rm ³	Reference CCREM, 1988
Hydrogen Chloride (HCl)	75 mg/Rm ³ (50 ppm _{dv})	Continuous Emission Monitor - 24 hours Rolling Average
Carbon Monoxide (CO)	57 mg/Rm ³ (50 ppm _{dv})	Continuous Emission Monitor - 4 hour Rolling Average
Total polychlorinated dibenzo- <i>p</i> - dioxins and polychlorinated dibenzofurans	0.08 ng/Rm ^{3*} (Toxic Equivalency Factor New International Method)	Annual Stack Test as required by EPS
Mercury	20 µg/Rm ³	Annual Stack Test as required by EPS

Rm³: Reference cubic metre, i.e., the volume of gas at 25°C and 101.3 kPa
ppm_{dv}: parts per million dry volume. (Table adapted from CCREM, 1988)

* Based upon congener-specific analytical test data; however, if only homologue test data are available, then the most conservative (largest) equivalency factor should be applied.

Notes: (1) *Incineration is a process whereby combustible materials are converted into non-combustible residue or ash, achieving a reduction of 90% by volume or 75% by weight when the incinerator is properly operated. Incineration has traditionally been the principal method used by health care facilities to process their anatomical and non-anatomical biomedical wastes. To date, incineration is the only disposal technology proven to be capable of handling all components of the biomedical waste stream.*

(2) *To meet the stack discharge limits presented in Tables 5 scrubber systems may be required.*

If crematoria incinerators are used to destroy biomedical waste, they can be used only to dispose of anatomical wastes. Crematoria incinerators are not required to meet the stack discharge limits stated in Tables 5. EPS should be consulted for the appropriate operating criteria.

To ensure the proper functioning and operation of an incinerator for biomedical waste, staff responsible for the incinerator should be trained in all aspects of incinerator operation. The appropriate incinerator should be selected, i.e., proper design, construction, controls, and instrumentation, and the incinerator should undergo regular maintenance.

The charging capacity of the incinerator should not be exceeded, and when incinerating wastes with high moisture content, supplementary fuel may be required to assure that necessary temperatures are attained and destruction is efficient.

Residues of incinerator ash normally discarded to sanitary landfill must pass the leachate extraction test as described in the *Guideline for Industrial Waste Discharges in the NWT*, Schedule IV.

Fly ash and bottom ash must be tested independently and must not be mixed before testing. Ash residues that fail the leachate extraction test must be managed as hazardous waste, see the *Guideline For Industrial Waste Discharges in the NWT*.

For further information on toxic equivalency – TEQ refer to Standardized Toolkit for Identification and Quantification of Dioxin and Furan Releases, United Nations Environment Program <http://www.chem.unep.ch> (Technical Annexes Chapter 11) or <http://www.mpip-mainz.mpg.de/~bluemler/extra/teaching/dioxine.pdf> or contact Environment Canada to purchase Reference Method for source Testing: Measurement of Releases of Selected Semi-volatile Organic Compounds from Stationary Sources <http://www.ec.gc.ca/publications>.

Disposal According to Type of Waste

7.3 Human Anatomical Waste

Human anatomical waste, consisting of human tissues, organs, and body parts, but excluding teeth, hair, and nails, must be incinerated in a biomedical waste incinerator or destroyed in a crematorium incinerator.

Note: *For religious or ethical reasons, human anatomical waste consisting of organs or body parts may in some cases be buried with human remains in a cemetery.*

7.4 Animal Waste

Most animal waste, with the exception of teeth, hair, nails, hooves, and feathers, should be incinerated in a biomedical waste incinerator. This includes all animal tissues, organs, body parts, carcasses, bedding, fluid blood and blood products, items saturated or dripping with blood, body fluids contaminated with blood, and body fluids removed for diagnosis or removed during surgery, treatment or autopsy, unless a trained person certifies that the waste does not contain the viruses and agents listed in Table 1.

Note: *When animal waste is managed under the Health of Animals Act (Canada), formerly the Animal Disease Protection Act (Canada), the attending inspector designated under the Act has the authority to require disposal by a means other than incineration.*

7.5 Microbiology Laboratory Waste

Microbiology laboratory waste consisting of laboratory cultures, stocks or specimens of microorganisms; live or attenuated vaccines; human or animal cell cultures used in research; and laboratory material that has come into contact with the above, must be incinerated, autoclaved, or chemically disinfected.

7.6 Human Blood and Body Fluid Waste

Except for those wastes associated with the exotic communicable diseases, fluid human blood and blood products, body fluids contaminated with blood, and body fluids removed for diagnosis or removed during surgery, treatment or autopsy, but excluding urine or feces, may be poured down the sanitary sewer after steam autoclave or chemical decontamination. The approval of the community works department and local Health Board is required. If approved, the treated waste should be carefully poured down a drain connected to the sanitary sewer.

When handling these fluids, care must be taken to eliminate spills and the formation of aerosols. At no time should these fluids be disposed of to the storm sewer.

Fluids associated with the six exotic communicable diseases (ECDS) listed by Health and Welfare Canada requires special handling. These diseases are: Lassa fever; Marburg virus disease; Ebola virus disease; the two South American hemorrhagic fevers - Junin and Machupo; and the Crimean- Congo hemorrhagic fever. Because of the potential infectivity of the agents causing these diseases, and their relatively high case-fatality rates, wastes contaminated by these diseases should be managed in consultation with the Laboratory Centre for Disease Control, Health and Welfare Canada (Health and Welfare Canada, 1988 to 1991).

Waste materials saturated or dripping with blood must be incinerated, autoclaved, or chemically disinfected. Approval from EPS is required for chemical decontamination if chemicals are other than Sodium hypochlorite, as the chemicals may adversely affect sewage treatment or sewage system maintenance personnel.

Notes: (1) *Typical items to which this requirement may apply include disposable surgical drapes and surgical gowns, sponges, dressings, etc. that are saturated or dripping with blood.*

(2) *Materials saturated with blood but intended for reuse may be laundered or reprocessed, they should not be considered waste. (Special handling is required and documented procedures provided to staff).*

If human blood and body fluid waste is incinerated, it must be contained such that the outer packaging is colour-coded yellow and bears the biohazard symbol. Liquid wastes contained in this way must not be disposed to NWT landfill, as they are not designed to accept waste liquids.

7.7 Waste Sharps

Clinical and laboratory materials consisting of needles, syringes, blades, or laboratory glass capable of causing punctures or cuts (referred to as waste sharps), must be incinerated. They may be autoclaved or chemically disinfected prior to incineration. When autoclaved, sharps containers must remain functionally intact at high autoclaving temperatures.

EPS will give consideration to proposals for alternate management methods that provide an equivalent level of environmental protection to those identified in this guideline.

8 Cytotoxic Waste Management

General

Although not specifically considered to be biomedical waste, cytotoxic waste must be handled and disposed of carefully. It is therefore included in these guidelines. Cytotoxic agents are considered to be hazardous materials with a toxic effect upon cells. The term is commonly used to refer to pharmaceuticals used in treating cancer, e.g., antineoplastics or chemotherapy agents. Cytotoxics can cause direct irritant or allergic reactions and may present a hazard due to their mutagenic, carcinogenic, and teratogenic properties.

For the purposes of these guidelines, the discussion of cytotoxics is restricted to drugs and other medicinal chemicals used in patient treatment or diagnosis. For additional information, readers should consult the Canadian Society of Hospital Pharmacist's publication entitled "Guidelines for the Handling and Disposal of Hazardous Pharmaceuticals (including Cytotoxic Agents)" (January 1991).

Techniques for chemical degradation are also provided by the publication Potentially Carcinogenic Chemicals Information and Disposal Guide (Armour, M.A., et al., 1986).

As with other wastes, segregation from the general waste stream is very important. Cytotoxic waste can range from a few drops on an alcohol swab to 2000 ml of dialysate solution. All items coming in contact with cytotoxic drugs must be treated as cytotoxic waste and handled and disposed of by incineration or chemical neutralization.

Protective equipment and clothing should be worn to prevent exposure of unprotected skin to the waste materials. While health care workers preparing and administering the agents are already aware of the concerns, special precautions should be taken to alert waste handlers of the type of materials they are handling.

All such waste should be placed within containers bearing the cytotoxic hazard symbol shown in Figure 3 and described in Subsection 3.4.1 of these guidelines.

Sharp objects, such as needles, broken glass, etc, that are contaminated with cytotoxics, must be placed within a sharps containers dedicated to cytotoxic waste, colour-coded yellow and bearing the cytotoxic hazard symbol.

Contaminated liquids should be placed in sealed containers; the original container is acceptable. In some situations, an absorbent material may be placed at the bottom of the waste container to absorb excess fluid.

Several disposal options are available. The one most advocated is incineration using temperatures in excess of 1,000 degrees C to completely destroy the cytotoxic agents.

If incineration is unavailable, chemical deactivation may be used for some agents. Chemical deactivation should be performed in a biological containment cabinet or under a fume hood using appropriate precautions, and protective equipment and clothing. If deactivation procedures are not performed within a biological containment cabinet or under a fume hood, additional visual and respiratory protective equipment should be worn.

Chemical degradation of cytotoxic waste using manufacturers instructions followed by sanitary sewer disposal is not a preferred disposal option but may be utilized if trained personnel undertake the neutralization in accordance with A Guide for the Safe Preparation and Disposal of Antineoplastic Agents ISBN 0-88621-088-7.

Spills Involving Cytotoxic Agents

Due to the hazardous nature of these agents, personnel cleaning up cytotoxic spills should use full protective equipment and clothing, such as gowns, double gloves, eye protection, and respiratory protection. In addition to the spill accident requirements listed in Subsection 2.9 of these guidelines, the following procedures should be followed when dealing with spills of cytotoxics:

- a) the spill should be contained and wiped up using appropriate absorbent material;
- b) the area should be washed with a detergent, followed by 70% alcohol (for aseptic areas) and then dried; and
- c) all contaminated materials must be discarded into designated cytotoxic waste containers.

9 Disposal of Waste Sharps in the Home Health Care Setting

Increasingly, patients are receiving intravenous solutions and/or medications, blood or blood products, and self-administered parenteral drugs in the home. These activities generate waste often identical to that generated in health care facilities.

In the home health care setting, i.e., the household, patients should be encouraged to dispose of sharps, such as used needles, syringes, and lancets, in a safe manner. Such objects pose a potential hazard to family members, friends and neighbours, and sanitation workers. These objects must not be disposed of in the sewer system.

Home health care providers, and in some cases the pharmacist or health care practitioner dispensing needles, syringes, lancets, etc., should encourage patients to place their sharps within an approved sharps container available through most pharmacies or community health centres. When full the sharps container should be delivered to one of the following hospitals for incineration or transfer to an incinerator:

Fort Smith	Fort Smith Health Centre
Inuvik	Inuvik Regional Hospital
Yellowknife	Stanton Regional Hospital

The generation of home care sharps can also be managed by the use of commercially available sharps management systems that contain chemical additives which when activated, decontaminate, stabilize and solidify the contents rendering the container safe for domestic garbage disposal.

10 Mercury in Dental Amalgams

Dentist offices routinely generate waste or excess dental amalgam from dental repairs. Disposal of this mercury containing amalgam into the sanitary sewer or municipal refuse collection system is an unacceptable practice. Environmental conditions at sewage lagoons or landfill can react with the amalgam and release the mercury into the environment.

Mouth wash and aspiration equipment should be equipped with ISO certified amalgam traps capable of a 95% capture rate. Maintenance of the mercury traps is also important to ensure collected mercury does not overload the collection system defeating the cost and installation of the equipment. Efforts should also be made to replace dental amalgam with non-mercury composite materials, where possible, to reduce amalgam waste.

All amalgam collected from dental offices must be managed as a hazardous waste. Disposal of articles contaminated with or containing mercury by any means other than shipment to an approved chemical management facility, mercury recycler or the product manufacturer is in contravention of the EPA.

11 Conclusion

This guideline is intended as a source of basic information and procedures involved in the management of biomedical waste. It does not replace the existing legislation referenced in this guideline. Changes to these guidelines may be necessary from time to time as legislation or standards change or new technologies develop. For more information contact:

1. Environmental Protection Division
Department of Environment and Natural Resources
600, 5102-50 Avenue, Yellowknife, NT, X1A 3S8
Phone: (867) 873-7654 Fax: (867) 873-0221
2. Road Licensing and Safety Division
Department of Transportation
Box 305, Hay River, NT, X0E 0R0
Phone: (867) 874-5007 Fax: (867) 874-2272
3. Prevention Services Division
Workers' Compensation Board
Box 888, Yellowknife, NT, X1A 2R3
Phone: (867) 920-3888 Fax: (867) 873-4596
or 1-800-661-0792 or 1-866-277-3677
4. Office of the Fire Marshal
Department of Municipal and Community Affairs
Box 1320, Yellowknife, NT, X1A 2L9
Phone: (867) 873-7469 Fax: (867) 873-0260
5. Lands Administration
Department of Municipal and Community Affairs
5201 – 50th Avenue, Yellowknife, NT, X1A 3S9
Phone: (867) 873-7569 Fax: (867) 920-6156
6. Environmental Health
Stanton Territorial Health Authority
Box 10, Yellowknife, NT, X1A 2N1
Phone: (867) 669-8979 Fax: (867) 669-7517
7. Indian and Northern Affairs Canada
Renewable Resources and Environment
Box 1500, Yellowknife, NT, X1A 2R3
Phone: (867) 669-2647 Fax: (867) 669-2707

8. Transport Canada
Place de Ville 330 Slater Street
Ottawa, Ontario, K1A 0N5
Phone: (613) 992-4624 Fax: (613) 954-5101
or
Transport Canada Central Region (Winnipeg)
402 - 344 Edmonton Street
Winnipeg, Manitoba, R3C 0P6
Phone: (204) 983-5969.
or
Central Region
Regional Superintendent
Dangerous Goods Aviation
Air Carriers Operations
Transport Canada Aviation
PO Box 8550
344 Edmonton Street
Winnipeg, Manitoba, R3C 0P6
Phone: (204) 983-1409 Fax: (204) 983-1734

12 Bibliography

Government of Alberta, Alberta Environmental Protection - Alberta User Guide for Waste Managers, Edmonton, (1995).

Government of Northwest Territories, Department of Renewable Resources¹ - Guideline for Industrial Waste Discharges in the NWT, Yellowknife, (1995).

Government of Northwest Territories, Department of Renewable Resources - Environmental Information Guide For Industrial Projects, Yellowknife, (1995).

Government of Northwest Territories, Department of Renewable Resources - Guideline for the General Management of Hazardous Waste in the NWT, (revised 1998), Yellowknife.

Transportation of Dangerous Goods Act 1992, Canada

Government of Saskatchewan, Saskatchewan Environment and Resource Management "Biomedical Waste Management Guidelines", 1997. (Saskatchewan Biomedical Waste Working Committee)

Canadian Council of Ministers of the Environment, 1992, "Guidelines for the Management of Biomedical Waste in Canada", CCME-EPC-WM-42E.

Ontario Hospital Association, 1982, "A Guide for the Safe Preparation and Disposal of Antineoplastic Agents", Hospital Occupation Health and Safety Services, C82-095327-X.

Health Care Occupational Health and Safety Association. 1989. "A Guide to the Safe Handling of Sharps". Occupational Health and Safety Manual for Health Care Institutions.

Government of the Northwest Territories: Department of Renewable Resources; Department of Health, Mackenzie Regional Health Services; Safety and Public Services; "Standards of Accepted Practice for Handling and Disposal of Sharps" September 6, 1989.

Ministry of Environment, Ministry of Health, Greater Vancouver Regional District, City of Vancouver, Biomedical Wastes in British Columbia, Report of the British Columbia Task Force on Biomedical Waste Management. May 1989.

Government of Ontario, Ministry of Environment, "The Management of Biomedical Waste in Ontario". Guideline C-4 (formerly 14-05) April 1994.

¹ In 1996 Renewable Resources was reorganized and the new department name is now Environment and Natural Resources.

Appendix A

Transport Requirements for Biomedical Waste by Road and Air

Road Transportation

For road transport purposes the following are TDGR documentation examples for the various types of biomedical waste:

Waste sharps, gloves masks etc.

Shipping Name: WASTE TOXIC SOLID, ORGANIC, N.O. S. (dried blood)
Classification: 6.1
P.I.N. Number UN 2811
Packing Group I, II, & III

Infectious Waste

Shipping Name: WASTE INFECTIOUS SUBSTANCES, AFFECTING HUMANS
(risk group IV, III, or II)
Classification: 6.2
P.I.N. Number UN 2814

Shipping Name: WASTE INFECTIOUS SUBSTANCES, AFFECTING ANIMALS
(risk group IV, III, or II)
Classification: 6.2
P.I.N. Number UN 2900

Cytotoxic wastes

Shipping Name: WASTE TOXIC SOLIDS, INORGANIC (name of major poisonous component)
Classification: 6.1
P.I.N. Number UN 3288
Packing Group I

Air Transportation

For air transport purposes the following are ICAO documentation examples and instructions for the various types of biomedical waste:

Shipping Name: Infectious substances, affecting humans only (technical name)
Classification: 6.2
UN/ID No.: 2814
Packing Group: I,II,III
Packing instructions: 602

Shipping Name: Infectious substances, affecting animals (technical name)
Classification: 6.2
UN/ID No.: 2900
Packing Group: I,II,III
Packing instructions: 602

Shipping Name Biomedical waste, n.o.s. (technical name)
Classification: 6.2
UN/ID No.: UN3291
Packing Group: II
Packing instructions: 622

Shipping Name: Clinical waste, unspecified, n.o.s. (technical name)
Classification: 6.2
UN/ID No.: 3291
Packing Group: II
Packing instructions: 622

Shipping Name: Medical waste, unspecified, n.o.s. (technical name)
Classification: 6.2
UN/ID No.: 3291
Packing Group: II
Packing instructions: 622

Shipping Name: Regulated medical waste, n.o.s. (technical name)
Classification: 6.2
UN/ID No.: 3291
Packing Group: II
Packing instructions: 622

Appendix B

Suppliers of Biomedical Waste Management Systems (Containment and Treatment)

Biomedical Waste Packaging Suppliers

Company / Compagnie	Address / Adresse	City / Ville	Province	Postal Code / Code Postal	Telephone / Téléphone	UN Packaging / Les emballage de l'ONU
ALBERTA						
Cratex Industries Ltd.	4735 - 82 Ave.	Edmonton	AB	T6B 0E5	(780) 468-4769	4GV
Great Western Containers Inc.	1912 - 66th Ave NW	Edmonton	AB	T6P 1M4	(780) 440-2222	1A1; 1A2;6HA1
Greif Brothers Canada	5408 - 52nd Ave. P.O. Box 191	Lloydminster	AB	T9V 2T5	(780) 875-4421	1A1; 1A2;1H1;1H2; 6HA1; 1G;1GV
Hood Inc., Packaging Div.	1222 - 34th Ave. S.E.	Calgary	AB	T2G 1V7	(403) 287-0450	5H4
Industrial Containers Ltd.	35 Calder Place	St. Albert	AB	T8N 5A6	(780) 458-5355	1H2
Tomark Compliance Centre	4801 - 32nd St. SE	Calgary	AB	T2B 2X3	(403) 272-5505	1A1; 1A2; 1H1; 4G; 4DV; 4GV
BRITISH COLUMBIA						
Kel-Ex Agencies Ltd.	1326 Main St.	North Vancouver	BC	V7J 1C3	(604) 986-4617	1A1; 1A2; 1H1; 4G; 4DV; 4GV
Novacan Industries Limited	856 Washington Dr.	Port Moody	BC	V3H 3K8	(604) 931-6422	4G
MANITOBA						
Endurapak Inc.	311 Alexander Ave.	Winnipeg	MB	R3A 0M9	(204) 947-1383	5H2; 5H3; 5M2
Reliance Products LP	1093 Sherwin Rd.	Winnipeg	MB	R3H 1A4	(204) 633-4403	1H1; 1H2; 4G
NOVA SCOTIA						
Intertape Polymer Group	50 Abbey Ave., PO Box 868	Truro	NS	B2N 5G6	(902) 895-1686	5H2; 5H3
Ropak Canada Inc., Can-Am Div.	PO Box 340	Springhill	NS	B0M 1X0	(902) 597-3787	1H2
ONTARIO						
AT Plastics Inc.	134 Kennedy Rd. S.	Brampton	ON	L6W 3G5	(905) 451-1630	5H4
Bonar Inc. Plastic Molding Div.	P.O. Box 88, 111 Verulam Rd.	Lindsay	ON	K9V 4R8	(705) 324-6701	3H1

Company / Compagnie	Address / Adresse	City / Ville	Province	Postal Code / Code Postal	Telephone / Téléphone	UN Packaging / Les emballage de l'ONU
ONTARIO (continued)						
Cousins-Currie Ltd.	400 Rowntree Dairy Road	Woodbridge	ON	L4L 8H2	(416) 746-8300	1H1; 4G; 6HG2
Dangerous Goods Consultants	975 Mid-Way Blvd.	Mississauga	ON	L5T 2C6	(905) 564-2453	4G; 4GV
Greif Brothers Canada Inc.	383 Main St.	Milton	ON	L9T 1P7	(416) 798-7064	1G; 1GV
Greif Brothers Canada Inc.	370 Millen Road	Stoney Creek	ON	L8E 2H5	(905) 664-4433	1A1; 1A2; 6HA1
Greif Brothers Canada Inc.	300 University Ave	Belleville	ON	K8N 5T6	(613) 968-6429	1H1; 1H2; 1G; 1GV
Greif Brothers Canada Inc..	165 Wyecroft Road	Oakville	ON	L6K 3S3	(905) 842-1473	1A1; 1A2
Hood Packaging Div.	2360 McDowell Rd.	Burlington	ON	L7R 4A1	(905) 637-5611	5M1; 5M2; 5H4
Hunter Drums Ltd.	5240 North Service Rd.	Burlington	ON	L7L 6C7	(905) 332-4800	1A1; 1A2
ICC The Compliance Centre	Unit 7 205 Matheson Blvd. E.,	Mississauga	ON	L4Z 1X8	(905) 890-7227	4G; 1A1; 1H1; 4DV; 4GV; 1A2
Industrial Containers Ltd.	27 Hansen Rd. S.	Brampton	ON	L6W 3H7	(405) 453-8802	1A1; 1A2
Industrial Containers Ltd.	Etobicoke	Toronto	ON	M8Z 2E2	(416) 231-5020	1H2
Ropak Canada Inc. Burlington Div.	2240 Wyecroft Rd.	Burlington	ON	L7L 5V3	(905) 827-9340	1H2
Scepter Manufacturing Company Ltd.	170 Midwest Rd.	Scarborough	ON	M1P 3A9	(416) 751-9445	3H1; 4H2
Vulcan Containers (Ontario) Ltd.	260 Centre St.	Petrolia	ON	N0N 1R0	(519) 882-1820	1A1; 1A2; 6HA1
QUEBEC						
Balcan Plastics Ltd.	304, rue Saulnier	Vimont	QC	H7M 3T3	(514) 326-9130	5H4
Dangerous Goods Consultants	2113 - L Boul. St. Regis	Dollard des Ormeaux	QC	H9B 2M9	(514) 684-0424	4G; 4GV
Emballages Hood	15, Rue David Swan	East Angus	QC	J0B 1R0	(819) 832-4971	5M1; 5M2; 5M4
Greif Brothers Canada Inc.	7000 Allard St.	Ville La Salle	QC	H8N 1Y7	(514) 363-0721	1G; 1GV
ICC The Compliance Centre	88 Lindsay Ave.	Dorval	QC	H9P 2T8	(514) 636-8146	1A1; 1A2; 1H1; 4G; 4DV; 4GV
Industrial Containers Ltd.	2079, rue Pigeon	LaSalle	QC	H8N 1A8	(514) 366-7700	1A1; 1A2
IPL Inc.	140 Commerciale	St. Damien	QC	G0R 2Y0	(418) 789-2880	1H2
Multisac, Div. of Workman Packaging Inc.	345 Montee deLiesse	St. Laurent	QC	H4T 1P5	(514) 344-7227	5H3
Papier Rouville Inc.	400 Henri Bourassa	Marieville	QC	J3M 1J9	(450) 460-4466	5M1; 5M2
Polymos Inc.	150 5th Blvd.	Terrasse- Vaudreuil	QC	J7V 5M3	(514) 453-1920	4G

Appendix C

Emergency Response Information

- Environmental Legislation, Environmental Protection Service, Department of Environment and Natural Resources, WEB site address:
<http://www.gov.nt.ca/ENR/eps/leg.htm>.



Canadian Transport
Emergency Centre

Français

REGISTRATION

WHY?

Paragraph 4.8 (1)(l) of the Transportation of Dangerous Goods Regulations (TDGR) requires consignors or manufacturers of dangerous goods to display a 24 hour emergency telephone number on their shipping documents. The TDGR provides consignors or manufacturers with the option to use CANUTEC's emergency telephone number pending they register and receive written agreement from CANUTEC to do so.

The purpose of this requirement is to ensure that technical assistance is immediately available to initial emergency responder during transportation of the dangerous goods.

The use of CANUTEC's emergency telephone number is a free service provided by Transport Canada.

HOW?

In order to register, a "Request to Use CANUTEC's Emergency Telephone Number" form (MS Word 6.0 document) must be completed and returned by mail along with additional information specified in the registration form. Upon reception of the required information, CANUTEC will forward a written confirmation granting permission to use its emergency telephone number. We suggest this document be conserved in your files as it is commonly requested during routine inspections by Transport Canada Inspectors.

For additional details please contact Kristen Steel.

Last Revised: September 7, 1999

[Home Page](#)

The wordmark for Canada, with a small Canadian flag icon to the right of the word.



Subject: Request to use CANUTEC’s Emergency Telephone Number

This is in response to your request to use CANUTEC’s 24 hour emergency telephone number (613) 996-6666 as required by section 4.8(1)(l) of the Transportation of Dangerous Goods Regulations.

The above referred section states that the shipper must display a 24 hour emergency telephone number on their shipping documents. Hence, the carrier is not responsible to fulfill this requirement.

In order to receive authorization to display CANUTEC’s 24 hour emergency telephone number the following information must be provided:

1. A completed “Request to Use CANUTEC’s Emergency Telephone Number” form (attached) that includes:
 - a. a 24 hour emergency telephone number where a representative of your company can be reached for information concerning your products and, if needed, on-site assistance. Where your company does not have access to a 24 hour business telephone number, you are required to provide your daytime business telephone number(s) and a **minimum of three** (3) names of representatives of your company along with their after business hour telephone numbers.
 - b. your signature (bottom portion of attached form) to certify that the telephone number(s) exist and can be used to obtain further emergency response related information.
 - c. a list of manufacturers for which you are a distributor-shipper.
2. A Material Safety Data Sheet (MSDS) for each product your company (and/or subsidiary companies) offers for transport. The MSDS’ should be provided in electronic format created by any word processing software (i.e. WordPerfect, Word, etc.) or saved as text or ASCII. You can have one file for each MSDS or one file containing many MSDS’s. The acceptable storage media formats are either 3.5 inch diskettes, CD Roms or Zip drive diskettes (contain 100 megabytes of information). Moreover, the MSDS’s may be e-mailed to canutec.services@tc.gc.ca (5 Megs maximum per message TC’s bandwidth capacity). If the electronic format is not available, MSDS’ in printed format must be provided to CANUTEC. When providing us with more than one MSDS’, these must be stapled and placed in binders in alphabetical order.

Companies which ship products other than the ones they manufacture (e.g. distributor) should submit the completed form prior to sending the requested MSDS' as the information may have previously been filed with CANUTEC. This would enable CANUTEC to advise you of which MSDS' would be required.

3. A complete list of the companies and subsidiaries that would be using CANUTEC's 24 hour emergency telephone number which includes names of representatives and their after business hour telephone numbers.

In order for CANUTEC to continue providing you with safe and efficient emergency assistance, it is imperative that any changes to the information submitted such as names of representatives or MSDS' **must** be communicated to CANUTEC as soon as they occur. Furthermore, the filed information (names of representatives, telephone numbers and MSDS') **must** be updated **every three years**.

If you have any questions, please feel free to contact me at (613) 947-5048.

Sincerely,

Kristen Steel
Transport Canada (CANUTEC)
Transportation of Dangerous Goods Directorate
Place de Ville, Tower C, 14th Floor
Ottawa, Ontario
K1A 0N5



CANUTEC

REQUEST **DEMANDE**
TO USE CANUTEC'S EMERGENCY TELEPHONE NUMBER **D'UTILISATION DU NUMÉRO DE TÉLÉPHONE DE CANUTEC**

1. PLEASE TYPE OR PRINT - PRIÈRE DE REMPLIR À LA MACHINE OU EN LETTRES MOULÉES

Address - Adresse	Contact name Personne à contacter	Area code and telephone no. Indicatif régional et num. de téléphone	Remarks - Remarques			
			1	2	3	4
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

*** Please check (x) appropriate box - Veuillez cocher (x) la case applicable**

1. 24 hr No. - Num. 24 hres 2. Office - Bureau 3. Home - Domicile 4. Answering service - Service d'appels

2. ARE YOU A - ÊTES-VOUS

Manufacturer - Fabricant Distributor - Distributeur

3. INDICATE MANUFACTURERS FOR WHICH YOU ARE A DISTRIBUTOR-SHIPPER INDIQUEZ LES FABRICANTS POUR LESQUELS VOUS ÊTES UN DISTRIBUTEUR-EXPÉDITEUR

I CERTIFY THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND TO THE BEST OF MY KNOWLEDGE		J'ATTESTE QUE LES RENSEIGNEMENTS FOURNIS CI-DESSUS SONT VRAIS ET EXACTS AU MEILLEUR DE MA CONNAISSANCE	
Name and title - Nom et titre		Telephone No. - Num. de téléphone	
Company name - Nom de l'entreprise		Address - Adresse	
Signature		Date	



Transport
Canada

Transports
Canada



CANUTEC

Canadian Transport Emergency Centre

(613) 996-6666
or
***666 (cellular)**

CANUTEC is the **Canadian Transport Emergency Centre** operated by Transport Canada to assist emergency response personnel in handling dangerous goods emergencies. This national bilingual advisory centre has established a scientific data bank on chemicals manufactured, stored and transported in Canada and is staffed by professional scientists specialized in emergency response and experienced in interpreting technical information and providing advice. Emergency response personnel can access CANUTEC's bilingual services by calling (613) 996-6666 collect.

CANUTEC deals with some 30,000 telephone calls per year with approximately 1,000 of these that require an emergency report.

Information Network

CANUTEC's data bank consists of information on more than 500,000 commercial products. The data bank is computerized with easy access to comprehensive information on individual product properties. CANUTEC also has access to a large number of industry data banks and has communication links with other emergency response centres.

CANUTEC has also established communication links with emergency response centres in other countries and has access to various international organizations' data banks. This provides the CANUTEC scientists with quick access to a vast national and international resource network.

In addition to these data banks, CANUTEC has access to, among others, the following resources:

- an extensive emergency response reference library;
- directories of Canadian and foreign chemical manufacturers, shippers and transporters;
- directories of emergency response groups across the country including public agencies both federal and provincial, medical facilities and health specialists;
- list of specialized equipment suppliers.

Services

Using the computerized information network accessible to them as well as their professional experience and knowledge, CANUTEC's scientists can provide immediate advice and recommend actions to be taken, and those to avoid, in dangerous goods emergencies.

CANUTEC's scientists, using the computerized information network accessible to them and their professional experience and knowledge, can provide immediate advice and recommend actions to be taken and those to avoid in dangerous goods emergencies.

Taking into consideration the characteristics of the dangerous goods involved and the particular conditions at the emergency site, CANUTEC's professional staff can provide immediate advice on:

- chemical, physical and toxicological properties and incompatibilities of the dangerous goods;
- health hazards and first aid;
- fire, explosion, spill or leak hazards;
- remedial actions for the protection of life, property and the environment;

- evacuation distances; and,
- personal protective clothing and decontamination.

CANUTEC staff does not go to the site of an incident. Advice and information are provided by telephone. In some instances, standard information and data can also be transmitted in printed copy to the site. This complements the verbal advice and recommendations given by CANUTEC staff members. CANUTEC can also provide communication links with the appropriate industry, government or medical specialists. The shipper of the dangerous goods involved can also be linked to the site to deal with instructions on cleanup, disposal and/or recovery.

Should on-site assistance be required, CANUTEC can activate industry emergency response plans such as TEAP, the Transportation Emergency Assistance Plan, operated by the Canadian Chemical Producers' Association or on-site assistance from other industry or government specialists. CANUTEC has also the capability of initiating Emergency Response Assistance Plans (ERAP). These plans are generally prepared by the shippers and registered with Transport Canada. They are required

for the dangerous goods listed in Schedule XII of the Transportation of Dangerous Goods Regulations (TDG).

Voice communications and written information are retained in confidence for two years for the protection of all parties.

CANUTEC also offers a 24-hour emergency telephone service. Shippers who wish to use CANUTEC's emergency telephone number on their dangerous goods shipping documents, must first contact CANUTEC at (613) 992-4624. In Canada, registration with CANUTEC is free of charge.

Research

To provide a high quality service, CANUTEC scientists research and investigate developments in emergency response technologies and new information regarding dangerous goods.

The data banks and library of the Centre are kept current through scientific literature searches and through national and

international data exchange agreements.

Information on individual chemical characteristics and historical data on accidents and other relevant research information involving a given chemical, is analysed to provide data for the interpretation of trends in the contingency planning and emergency response fields. Comprehensive information on the uses and limitations of data, methodologies or equipment is developed through the use of consultants and laboratories on a contract basis.

Joint international research projects are developed and undertaken.

North American Emergency Response Guidebook 1996 (NAERG96)

CANUTEC has been extensively involved in the production of the NAERG96 which is the result of an International collaborative effort between Canada, the United States and Mexico. Initiated under NAFTA, this project intends to improve hazards communication between the three countries by harmonizing emergency response recommendations for transportation incidents. The NAERG is also available for free use at CANUTEC's web site.

Other Services

CANUTEC staff also provides an information service on all aspects of the regulatory requirements for the handling, offering for transport and transporting of dangerous goods by all modes of transport. In fact, CANUTEC is the primary contact point for the Transport of Dangerous Goods Directorate on questions regarding transport dangerous goods regulations and chemical products. For general information CANUTEC should be reached by calling the information number (613) 992-4624, to keep the emergency telephone lines free.

Reporting Requirements

Federal regulations require that CANUTEC must be contacted in the event of an incident or accident involving radioactive materials or infectious substances. As well, provincial or municipal statutes may require reporting of dangerous goods incidents or accidents to identified authorities. It is important to note that calling CANUTEC for assistance does not replace the required reporting under provincial or municipal statutes or the federal requirements for written reports.

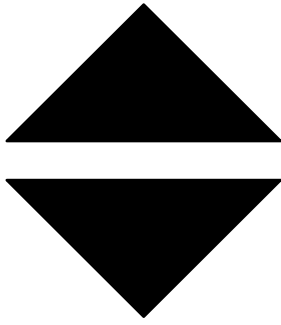
CANUTEC (613) 996-6666 collect

CANUTEC, established in 1979, is part of the Transport Dangerous Goods Directorate within Transport Canada. The Directorate's overall mandate is to regulate the safe handling, offering for transport and transporting of dangerous goods by all modes. CANUTEC is one of the major safety programs that Transport Canada delivers to promote the safe movement of people and goods throughout Canada.

For further information, please call or write to:

CANUTEC
Transport Dangerous Goods Directorate
Transport Canada
Ottawa, Ontario
Canada
K1A 0N5
(613) 992-4624 (Phone)
(613) 954-5101 (FAX)
canutec@tc.gc.ca (e-mail)
<http://www.canutec.gc.ca>
(Internet)

Canada



Dangerous Goods

If you wish to receive the Newsletter,
please complete the coupon below and send it to:

Transport Canada
Transport Dangerous Goods
Place de Ville, Tower C, 9th Floor
Ottawa, Ontario
K1A 0N5
or
Fax: (613) 993-5925

c/o Editor, Dangerous Goods Newsletter

TDG

Name:			
Organization:			
Mailing Address:			
City:		Province:	
Postal Code:		Tel. No.:	
English: <input type="checkbox"/>	French: <input type="checkbox"/>	Both: <input type="checkbox"/>	
No. of copies required: <input type="checkbox"/>			



Transport
Canada
Safety and Security
Dangerous
Goods

Transports
Canada
Sécurité et sûreté
Marchandises
Dangereuses

Canada

Appendix D

Biomedical Waste Carrier Drivers Certificate

Example:

Certificate of training Transport Dangerous Goods		
_____ Name of employee		
_____ Address		
_____ City	_____ Province	
_____ Signature of employee		
<p>has completed the training described on the reverse, in accordance with the requirements of the Transportation of Dangerous Goods Regulations.</p>		
_____ Name of employer		
_____ Address		_____ City
_____ Signature of employer		_____ Date of initial training
Class and division	X	Training
	<input type="checkbox"/>	(a) - Classification
	<input type="checkbox"/>	(b) - Packaging
	<input type="checkbox"/>	(c) - Safety marks
	<input type="checkbox"/>	(d) - Shipping documents
	<input type="checkbox"/>	(e) - Prescribed special precautions
	<input type="checkbox"/>	(f) - Dangerous occurrence reporting
	<input type="checkbox"/>	(g) - Emergency measures
	<input type="checkbox"/>	(h) - Proper utilization of equipment
	<input type="checkbox"/>	(i) - Use of safety equipment
_____ Expiry date (1)	_____ Trained by	
	_____ Number (if applicable)	
_____ Expiry date (2)	_____ Dates of subsequent training	