



Ministry of  
Environment

# HAZARDOUS WASTE LEGISLATION GUIDE

October 2016

# CONTACTS

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## WHERE TO REPORT SPILLS (24 HOURS)

Provincial Emergency Program  
Canadian Coast Guard (to report marine spills)

1-800-663-3456  
604-666-6011  
or toll-free 1-800-889-8852

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## MINISTRY OF ENVIRONMENT: ENVIRONMENTAL PROTECTION DIVISION

Victoria

Email: [hazwaste@victoria1.gov.bc.ca](mailto:hazwaste@victoria1.gov.bc.ca)

### REGIONAL OFFICES

#### ***Southern Region***

##### **Vancouver Island**

Nanaimo 250-751-3100

##### **Lower Mainland**

Surrey 604-582-5200

##### **Thompson**

Kamloops 250-371-6200

##### **Okanagan**

Penticton 250-490-8200

##### **Kootenay – Boundary**

Nelson 250-354-6333

Cranbrook 250-489-8540

##### ***LNG and Oil & Gas Team***

Prince George 250-565-6135

Nanaimo 250-751-3100

#### ***Northern Region***

##### **Cariboo**

Williams Lake 250-398-4530

##### **Skeena**

Smithers 250-847-7260

##### **Omineca**

Prince George 250-565-6135

##### ***Mining Team***

Williams Lake 250-398-4530

##### **Southern Interior and Northeast Projects**

Surrey 604-582-5200

##### **Southeast Projects**

Smithers 250-847-7260

##### **Northwest and South Coast Projects**

Nanaimo 250-751-3100

## MINISTRY OF PUBLIC SAFETY AND SOLICITOR GENERAL

Dangerous Goods (Victoria) 250-953-4016

## TRANSPORT CANADA

Canadian Coast Guard (24-hour marine spill reporting) 604-666-6011  
Transport Canada (TDG-Vancouver) 604-666-2955  
CANUTEC (Ottawa) 613-996-6666  
Emergencies Information 613-992-4624

## ENVIRONMENT CANADA

Oil and Chemical Spill Reports (24 hours) 604-666-6100

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# **Hazardous Waste Legislation Guide**

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for

Ministry of Environment  
The Province of British Columbia

October 2016

Copies of this guide are available in electronic format from the [Hazardous Wastes](#) section of the Ministry of Environment web site or in hard copy from [Crown Publications Inc.](#)

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# HOW TO USE THIS GUIDE

This guide explains how to follow the laws in BC for managing hazardous waste. It also describes the province's programs for managing hazardous waste.

The guide has 22 chapters. It starts with a brief introduction and goes through procedures required to identify, handle, store, transport, and dispose of hazardous wastes.

**Links** In this guide, text in *blue italics* is linked to other sections. After clicking on a link, it is usually possible to return to the origin of a link by pressing the *Alt* key together with the left arrow key.

Text in *underlined blue italics* is linked to web content or an email address. Clicking on a web link may open a web page or may require saving web content.

**Figures** Tables, diagrams, and charts are numbered in order and referred to as *Figures*. For example, Figure 11, whether it is a table or a chart, is always located after Figure 10. In addition, all figures appear at the end of the chapter that first refers to them.

**When is a Waste a Hazardous Waste?** People who generate or own waste need to know first if their wastes are hazardous. They should start with Chapter 3, *When is a Waste a Hazardous Waste?* A good chemical and physical characterization of the waste is often required to answer this question. This may require access to a well-equipped laboratory for chemical analyses.

**Registration** For anything more than very small quantities, the next step is to register the waste with the Ministry of Environment if it is hazardous. Chapter 4, *Registration*, discusses the quantities that must be registered, how to register, and what time is allowed for registering.

**Containers** Containers are an important part of any option for managing hazardous waste. Before putting hazardous waste into containers, review Chapter 5, *Containers for Hazardous Waste* (and Section 3.0 in Chapter 10, *Storage Facilities*, if storage of PCB wastes is involved). This could save time and effort by avoiding use of the wrong types of containers or packing in incompatible combinations.

**Transport** Chapter 6, *Transporting Hazardous Waste*, discusses transport of hazardous waste. This chapter is very important for people who consign (ship), carry, or receive hazardous waste. It discusses the system of Provincial identification numbers used for identifying consignors/shippers, carriers and consignees/receivers, how to get a transport licence, and everyone's responsibilities for completing a manifest.

**Management Options** If a waste is found to be hazardous waste, a decision must be made soon after on how to manage it. Various ways of managing hazardous wastes are reviewed in Chapter 7, *Hazardous Waste Management Options*. This chapter includes a table giving options for reusing, treating, or disposing of different types of hazardous wastes.

**Requirements** The chapter to consult next depends on how the waste is going to be managed. Chapter 8, *All Hazardous Waste Facilities*, is very important because it discusses the general requirements for all facilities. Chapters 9 to 16 discuss the additional requirements that apply to specific types of facilities. For example, if waste is

going to be managed at a mobile treatment facility, the following chapters should all be reviewed:

- Chapter 8, *All Hazardous Waste Facilities*
- Chapter 11, *Treatment Facilities* and
- Chapter 13, *Mobile Facilities*

**Prohibited Practices** Chapter 17, *Prohibited Management Practices*, discusses some practices that may not be used to manage hazardous wastes:

- mixing or diluting
- underground injection (except as allowed in the Oil and Gas Waste Regulation for oil or gas extraction)
- location of any types of hazardous waste facilities on water and
- discharges to municipal sewers or landfills

**Less Restrictive Options** Alternative, less restrictive options are allowed for managing some specific types of hazardous waste. Chapter 18, *Specific Hazardous Wastes*, discusses the special provisions allowed for managing:

- waste asbestos
- waste oil
- hydrocarbon contaminated soil
- pesticide wastes
- waste paint and
- household hazardous waste

**Authorizations** Chapter 19, *Permits and Other Forms of Authorization*, discusses the various types of authorizations that may be required for managing or transporting hazardous waste. The chapter explains:

- types of authorizations
- how to apply for a permit for discharge to the environment or for a secure landfill
- decision-making and appeal processes for permits
- some cases where authorization is not required and
- how to apply for a change in requirements or delisting of a hazardous waste

**Enforcement and Penalties** Chapter 20, *Enforcement and Penalties*, explains how BC's laws are enforced and summarizes some of the offences and possible penalties. In some cases, penalties under federal legislation such as the *Canadian Environmental Protection Act*, the *Transportation of Dangerous Goods Act*, or the *Fisheries Act* may also apply.

**Contingency Planning** Provincial requirements for contingency planning, spill reporting, and management of spills are discussed in Chapter 21, *Contingency Planning*.

**Contacts and Links** The inside cover contains an abbreviated list of contacts for various government agencies involved in managing hazardous wastes. A more complete list of contacts and links is given in *Appendix A*.

**Other Resources** The guide contains other useful resources:

- selected information sources in *Appendix B* and
- a glossary explaining various technical terms in *Appendix C*

**Updates** The law on hazardous wastes changes from time to time. Anyone managing hazardous waste must therefore have a way to keep up to date with these changes. Officially, changes to provincial law are published in the *British Columbia Gazette*. However, unofficial announcements can usually be found on the [Hazardous Waste](#) section of the Ministry's web site. Some companies also offer updating services by subscription or for a fee.

As changes are made to the law on hazardous waste, this guide may also be revised. Check the [Hazardous Waste](#) section of the Ministry's web site for the latest edition.

**Important Terms** Many parts of the Hazardous Waste (HW) Regulation and this guide refer to decisions or actions by a director. Section 1 of the *Environmental Management (EM) Act* defines a director. In addition, section 3 of the *EM Act* allows a director to delegate most powers to another person. So, in this guide, a *director* means:

- a person employed by the government and designated in writing by the minister as a director of waste management or as an acting, deputy, or assistant director of waste management
- a person to whom powers have been delegated by a director or
- a district director for cases that are within the jurisdiction of a district director appointed under section 31, 32, or 33 of the *EM Act*

The term *approved* is also used often. Section 1(2) of the HW Regulation specifies that for something to be approved, it must be in writing and it must be issued by a director, unless another person's approval is specifically required.

**Disclaimer** Finally, this guide is not a legal document. In all cases the *EM Act*, regulations, and other legislation take precedence. If further explanation of BC's system for managing hazardous waste is required, consult Hazardous Waste Program staff in Victoria or any office of the Regional Operations Branch.





# INTRODUCTION

Hazardous wastes are wastes that could harm human health or the environment if not properly handled or disposed of. Special techniques are needed to eliminate or reduce the hazards. Hazardous wastes must not be sent to ordinary landfills or discharged to sewer; more specialized facilities are required to deal safely with these wastes. Chapter 7, *Hazardous Waste Management Options*, discusses options for managing hazardous wastes. Preferred options are discussed first.

Hazardous wastes may be hazardous in many different ways. They may be corrosive, ignitable, infectious, reactive, toxic, or bioaccumulative. They may range from paints, oils, and solvents to acids, heavy metals, and pesticides. Most of us know them as the by-products of an industrialized society.

There are various ways of dealing properly with hazardous wastes. This guide explains BC's system for managing these troublesome substances, with emphasis on the laws and regulations that apply.

## 1.0 Background

In the late 1970s, the lack of facilities for proper treatment and disposal of hazardous wastes in BC became clear as a result of a number of serious incidents. The need to clean up abandoned chemicals and contaminated work sites led the government to develop plans for a waste management system that could handle these hazardous materials.

Part of the initial planning included the commissioning of a comprehensive hazardous waste management strategy for the four western provinces, North-western Ontario, the Yukon and Northwest Territories, and the federal government of Canada.

Following publication of the strategy, a committee was established to advise on development of safe, acceptable methods and facilities for managing hazardous wastes in BC. The committee's recommendations were published in June, 1981, in the *Report of the Hazardous Waste Advisory Committee*. This work formed the groundwork for the provincial hazardous waste management program.

The committee recognized that a comprehensive system was needed for managing hazardous waste in BC. Five major program elements were identified for this system:

- technologies to recycle, treat, store, transport, and dispose of hazardous wastes
- operators for hazardous waste management facilities
- suitable locations for these facilities
- laws and regulations to ensure proper and safe operation of the system and
- programs to inform the public about the hazardous waste system

Significant progress has been made in all five program elements. The Ministry of Environment will continue efforts to make further progress in these areas.

## 2.0 Acts and Regulations

This document is a guide to the law in BC for managing hazardous wastes.

**Provincial** The provincial acts and regulations most relevant to this topic are:

- *Environmental Management (EM) Act*
- Hazardous Waste (HW) Regulation
- *Environmental Assessment Act* and
- Reviewable Projects Regulation

Among other things, the *EM Act* sets up a comprehensive framework for regulating hazardous wastes in BC. The details are contained in the HW Regulation and include:

- registration of activities involving hazardous waste
- requirements for hazardous waste facilities
- containers for storing and transporting hazardous wastes
- licensing of hazardous waste carriers and
- requirements for specific types of hazardous waste

The *Environmental Assessment Act* sets up the framework for reviewing projects that may have an environmental impact. Details are contained in regulations under the Act, including the Reviewable Projects Regulation. This Regulation specifies the types and capacities of hazardous waste facilities that are reviewable.

**Federal** The federal acts and regulations most relevant to managing hazardous wastes are:

- *Canadian Environmental Protection Act*
- Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations
- Interprovincial Movement of Hazardous Waste Regulations and
- *Transportation of Dangerous Goods Act* and Regulations

**Disclaimer** This guide is not a legal document. Acts and regulations always take precedence over any interpretation given in this guide.



# WHEN IS A WASTE A HAZARDOUS WASTE?

What is a hazardous waste? How do I know if I have a hazardous waste? When does the Hazardous Waste (HW) Regulation apply? The answers to these questions depend on four key considerations:

- definition of a waste
- composition, properties, and origin of a waste
- definition of hazardous waste and
- where in a process the waste is evaluated to find out if it is a hazardous waste

The rest of this chapter discusses these considerations further and provides detailed procedures for evaluating and naming wastes.

## 1.0 Waste Substances

The definition of waste from section 1 of the *Environmental Management (EM) Act* is shown in [Figure 1, Definition of Waste](#). The terms *air contaminant*, *effluent*, and *refuse* are further defined in the *EM Act*; the terms *biomedical waste* and *hazardous waste* are further defined in the HW Regulation.

The first part of the definition lists various types of wastes. The second part of the definition states that commercial value or usefulness does not stop something from being a waste. This exclusion is important because it broadens the definition of waste. It means that by-products, recyclables, and reusable substances must be evaluated to find out if they are hazardous waste.

## 2.0 Waste Composition, Properties, and Origin

Under the HW Regulation, the generator of a waste is mainly responsible for knowing the composition, properties, and origin of a waste. This knowledge is required to properly evaluate the waste, as well as to protect the generator, the generator's employees, the public, and the environment. The services of a well-equipped analytical laboratory may be needed to get some of this information.

### **Analytical Methods**

Analysis of wastes to determine the composition or properties must always be measured according to the test methods specified in the applicable regulations.

For determining if wastes may be dangerous goods, these are the methods in the *Manual of Tests and Criteria* published as part of the *Recommendations on the Transport of Dangerous Goods*, 17th Revised Edition, 2011, United Nations.

For other purposes related to the HW Regulation, these are:

- methods specified in the HW Regulation
- if not specified in the regulation, methods as detailed in the [BC Environmental Laboratory Manual](#) available from the Monitoring section of the Ministry's web site or
- if not in either of the above, as approved by a director

A director may vary methods specified in the HW Regulation or the *BC Environmental Laboratory Manual* if the director feels there is reason to do so.

### 3.0 Definition of Hazardous Waste

The definition of hazardous waste in BC is given in section 1 of the HW Regulation as shown in [Figure 2, Definition of Hazardous Waste](#).



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**Note:** The definition of hazardous waste in BC is not necessarily the same as in other provinces or for wastes crossing Canadian borders—be sure to check with the regulations of other jurisdictions as applicable.

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The first substances listed in the definition are dangerous goods in certain classes that are no longer used for their original purpose. So what are dangerous goods?

#### **Dangerous Goods**

In 1985, BC joined the federal government and the other provinces to agree on a national definition of dangerous goods. This definition is given in the federal *Transportation of Dangerous Goods (TDG) Act*.

Under the *TDG Act*, *dangerous goods* means: a product, substance, or organism included by its nature or by the regulations in any of the classes listed in the schedule. Step 4 in Section [5.0, Waste Classification Procedure](#), explains in more detail what this definition means and how it must be used.

The TDG Regulations repeat the definition of dangerous goods and provide the details for defining and classifying them. Because many hazardous wastes are dangerous goods as defined by the TDG Regulations, the HW Regulation uses the same rules to define and classify the more hazardous wastes.

For this reason, the waste generator must have a good understanding of the TDG Regulations. The *TDG Act* and Regulations are available online from the [Transport of Dangerous Goods](#) page of Transport Canada's web site.

#### **Other Types of Hazardous Wastes**

Most of the other 11 types of substances listed as hazardous wastes are further defined in separate definitions in section 1 of the HW Regulation.

### 4.0 Evaluation Point

The point in a process where a substance becomes waste is important. This is the point where the substance must be evaluated to see if it is hazardous waste. If the substance is hazardous waste at this point, it means that all facilities for handling the waste after this point must comply with the HW Regulation. In many cases, the point where a substance becomes waste is not the point of discharge or final disposal.

Using the proper point to evaluate substances is one of the most difficult aspects of working with the HW Regulation. While there is no answer that always applies, it is suggested that process streams be evaluated at the point beyond which no useful product or purpose is derived. In some cases, however, Environmental Protection Division staff may require generators to use a different point of evaluation.



## 5.0 Waste Classification Procedure

In essence, a process of elimination is used to find out if a waste is hazardous waste. The composition, properties, and origin of a waste are checked against a series of excluded substances, criteria, and descriptions. A waste is a hazardous waste if no exclusion is applicable and:

- any of the criteria are exceeded or
- the waste matches any of the descriptions

A standard sequence of steps is followed for this checking process. The steps follow from the definition of hazardous waste and are described in more detail below. [Figure 3, Classification Flowchart](#), shows the process schematically.



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**Note:** Wastes must be properly evaluated. There are severe penalties under both the TDG Regulations and the HW Regulation for not correctly classifying wastes that are dangerous goods or other hazardous waste.

It is also important to follow the steps in the order given to make sure that the most hazardous property of a waste is properly identified. This is especially the case if a waste exceeds the criteria or meets the descriptions of more than one type of waste.



**Tip:** Formal tests may not be required at each step if the origin of a waste, the process generating it, or other information indicates that a particular test is not required. It is suggested that a written record be kept of the reasons why a test was not required.



**Tip:** It may be possible to save on disposal costs by spending more time and money to find out if disposal as hazardous waste is really required. Disposing of waste as hazardous waste is more costly than disposing of it as non-hazardous waste.

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### Step 1: Starting Point

Start with the substance or process stream to be evaluated. Is this substance or stream waste?



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**Note:** As indicated in Section 1.0, [Waste Substances](#), commercial value or usefulness does not prevent a substance or stream from being waste.



**Note:** Explosives are regulated by the *Explosives Act*, and radioactive materials are regulated by the Nuclear Safety Commission. Such materials are not considered waste and cannot therefore be hazardous waste.

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If the waste is being generated in a process, go back in the process to the point where the waste is first generated—see Section 4.0, [Evaluation Point](#).

### Step 2: Exclusions

Is the waste excluded from being hazardous waste by definition? Wastes that are not hazardous waste by definition are listed in the lower part of [Figure 2, Definition of Hazardous Waste](#).

**Step 3: Characterization**

What are the properties of the waste and what is in it?

The amount of work and the methods used to characterize a waste vary. They usually depend on how the waste was generated or where it came from.

Analysis, calculations, or knowledge of the waste origin may all be used for characterization as long as they give enough information to check if the waste is *classified* as described below.

**Step 4: Dangerous Goods Check**

Would the waste be classified and regulated as dangerous goods according to the Transportation of Dangerous Goods (TDG) Regulations if transported?

A waste is classified as dangerous goods if it is in one or more classes defined by the TDG Regulations. The possible TDG classes and divisions of classes that need to be considered when classifying wastes are summarized in [Figure 4, Summary of TDG Classes for Wastes](#).



**Tip:** Some substances that are classified as dangerous goods are exempt from regulation. Exemptions are given in Part 1 of the TDG Regulations and include a short list of exempt substances in section 1.46.



**Note:** By definition of dangerous goods in the HW Regulation, the exemption in section 1.25 of the TDG Regulations does not apply to hazardous wastes.

Although there are other exemptions from regulation in Part 1 of the TDG Regulations, some of these are not appropriate for waste substances. The exemptions that are not appropriate for waste substances are usually those that apply only in specific cases, such as transport by road or rail. If in doubt, consult Hazardous Waste Program staff to find out if an exemption is appropriate.

**Classification Criteria**

Part 2 of the TDG Regulations contains the *classification criteria* for each of the TDG classes. The classification criteria are the values of properties that decide if a substance is in a TDG class or not. Properties used for classification must always be measured according to the test methods specified in the regulations.

To check if a waste is classified, compare the value of each waste property against each possible corresponding classification criterion. If any criterion for a class is exceeded, then the waste is in that class.



**Example:** Flashpoint is one property used to measure the flammability of liquids. According to the TDG Regulations, a liquid is in class 3 if it has a flashpoint of 60 °C or less.

A fuel has a flashpoint of about 21 °C. So, according to the TDG Regulations, this fuel is a flammable liquid in class 3.

**Packing Groups/  
Categories**

For classified substances other than gases and infectious substances, the TDG Regulations have further criteria for packing groups. The most hazardous substances within a class are in packing group I; the least hazardous are in packing group III. If a substance is classified, the criteria for packing groups must be used to work out the correct packing group.

Infectious substances are divided into categories instead of packing groups. Category A substances are generally considered more hazardous than Category B substances. At the time of revising this guide, the definition of biomedical waste in the HW Regulation refers to *risk groups*, which was an earlier way of dividing infectious substances.

**Multiple Classes**

It is possible for substances to be in more than one class. If a substance is found to be in a class, check other possible classes, excluding class 9. If a waste is already in a class other than class 9, class 9 does not have to be checked.

**Precedence of Classification**

If a substance is in more than one class, the class that shows the most important hazard must be identified. This is called the primary class. Use the rules in section 2.8 of the TDG Regulations to work out which is the *primary class*. Any other classes are *subsidiary classes*.

**List of Dangerous Goods**

Schedule 1 of the TDG Regulations contains a list of dangerous goods, together with information for each listing on:

- class and packing or risk group
- special provisions (notes that apply to a specific listing)
- various quantity limits and
- emergency response

Two types of dangerous goods are listed:

- specific, common substances, such as gasoline or sodium hydroxide solution and
- non-specific substances with a generic name, such as solids containing flammable liquid, n.o.s. or toxic liquid, organic, n.o.s.

The abbreviation “n.o.s.” means *not otherwise specified*.

**Specifically Listed Dangerous Goods**

Substances in their normal trade or technical grade can often be classified without reference to the classification criteria if they are specifically listed in Schedule 1. A few wastes can be classified this way.

Examples could be:

- gasoline that is waste because of contamination with dirt or water
- paint that is waste because two different colours have been mixed together
- medicines that are past their expiry date or
- wet batteries filled with acid or alkali that are waste because they no longer hold their charge

In each of the above examples, the hazardous properties before and after the substance becomes waste are likely to be the same. The waste may therefore be classified directly by referring to Schedule 1.

**Generically Listed Dangerous Goods**

Substances that are not specifically listed cannot be classified directly by referring to Schedule 1. Their properties must be checked against the classification criteria to see if they are classified. This applies to most wastes.

If a waste is found to be regulated dangerous goods and classified as described in Step 4, then the waste is a hazardous waste. All that remains is to select the correct name for the waste—see Section 6.0, [Names for Hazardous Wastes](#).

If the waste is not regulated dangerous goods, continue with Step 5.




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**Tip:** Remember that dangerous goods are classified so that they can be transported safely.

For example, for safety reasons, carriers or emergency response personnel are very interested to know if a substance is likely to catch fire. So substances that are only slightly flammable are classified as dangerous goods.

On the other hand, carriers or emergency response personnel do not taste substances that are carried or spilled. So substances must be distinctly toxic by mouth to be classified as dangerous goods.

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**Penalties:** Anyone not complying with the *TDG Act* may be:

- fined up to \$50 000 for a first offence and up to \$100 000 for subsequent offences and/or
- imprisoned for up to two years and/or
- required to do things that cost up to \$1 000 000 per offence

Each day that an offence continues may be a separate offence.

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### **Step 5: Hazardous Waste Regulation Check**

Is the waste one of the other types of hazardous waste defined in the HW Regulation that are not dangerous goods?

#### **PCB Wastes**

The HW Regulation defines *PCB wastes* as: PCB liquid, PCB solid, and PCB equipment that have been taken out of service for the purpose of treatment, recycling, reuse, or disposal, or for the purpose of storage prior to treatment, recycling, reuse, or disposal.

The terms *PCB liquid*, *PCB solid*, and *PCB equipment* are further defined in section 1 of the HW Regulation.



**Note:** Most PCB wastes are dangerous goods under the TDG Regulations and are at least in class 9. Other classes may apply if there are other hazardous materials in the waste.



**Note:** The HW Regulation definition is broader than the TDG definition because it specifically includes PCB equipment that has been taken out of service.

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#### **Biomedical Waste**

The HW Regulation defines *biomedical waste* as specific types of wastes from the following sources:

- human or animal health care facilities
- medical or veterinary research and teaching establishments
- health care teaching establishments
- clinical testing or research laboratories and
- facilities involved in the production or testing of vaccines

Operators of such facilities should refer to section 1 of the *HW Regulation* for details.



**Note:** Biomedical wastes that contain specific organisms listed in Part 2 of the TDG Regulations are dangerous goods in class 6.2.

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**Waste Containing Dioxin**

The HW Regulation defines *waste containing dioxin* as: waste containing dioxin TEQ in a concentration greater than 100 parts per billion by weight.

*Dioxin TEQ* (toxicity equivalent) is a number that allows the toxicity of substances containing different dioxins and furans to be compared. Dioxin TEQ is the amount of the single most toxic dioxin a substance would have to contain to have the same toxicity as the substance containing the different dioxins and furans. Section 1 of the HW Regulation describes how to calculate dioxin TEQ.

In summary, dioxin TEQ is calculated by:

- multiplying the concentration of each compound listed in Schedule 1 of the HW Regulation by its toxicity equivalency factor (TEF) and then
- adding all of the multiplied numbers together

If a measured concentration is below the detection limit of the analytical method, the concentration is assumed to be half of the detection limit.



**Note:** The dioxin TEFs listed in Schedule 1 have been updated. See [Order in Council No. 747](#) posted on the Ministry's web site for the new values effective 1 November 2017.



**Note:** Wastes containing large amounts of dioxin could be dangerous goods under the TDG Regulations. The most likely class would be 6.1.

**Waste Oil**

The HW Regulation defines *waste oil* as: automotive lubricating oil, cutting oil, fuel oil, gear oil, hydraulic oil, or any other refined petroleum-based oil or synthetic oil where:

- the oils are in the waste in a total concentration greater than 3% by weight and
- the oils through use, storage, or handling have become unsuitable for their original purpose due to the presence of impurities or loss of original properties



**Note:** Some waste oil may be dangerous goods under the TDG Regulations in class 3 if it has a flashpoint less than 60 °C.



**Note:** Solids can be waste oil. Examples could be soil contaminated with more than 3% oil or sorbents used for spill clean-up containing more than 3% oil.

**Waste Asbestos**

The HW Regulation defines *waste asbestos* as: a waste containing friable asbestos fibres or asbestos dust in a concentration greater than 1% by weight either at the time of manufacture, or as determined using a method specified in section 40 (1) of the HW Regulation.

The methods specified in section 40 (1) are the most recent versions of:

- US Environmental Protection Agency *Method 600-R-93-116*, or
- US National Institute for Occupational Safety and Health *Method 9002*



**Note:** In practice, any waste that is waste asbestos by the above definition is dangerous goods under the TDG Regulations and is at least in class 9.



**Tip:** Asbestos that is tightly bound so that fibres or dust are not easily released is not hazardous waste. Examples could include hardboard or brake linings.

**Pesticide Wastes**

Under the HW Regulation, waste pest control product containers and wastes containing pest control products, including wastes produced in the production of treated wood products using pest control products, are defined as hazardous waste.



**Note:** Wastes containing pest control products could be dangerous goods under the TDG Regulations. The most likely classes would be 2, 3, 6.1, or 9.

**Leachable Toxic Waste**

The HW Regulation defines *leachable toxic waste* as: waste when subject to the extraction procedure described in the US Environmental Protection Agency *Method 1311* produces an extract with a contaminant concentration greater than those prescribed in Table 1 of Schedule 4.

*Method 1311* is often called the *Toxicity Characteristic Leaching Procedure* or *TCLP*.

The *TCLP* applies to liquids, solids, and liquid/solid mixtures. If the solids separated from a liquid/solid mixture are less than 0.5% by weight, then the liquid alone is analysed for contaminants.



**Note:** The *Modified Leachate Extraction Procedure* given in Schedule 4 of the HW Regulation cannot be used to see if a waste is leachable toxic waste. The *Modified Leachate Extraction Procedure* is only used to see if wastes may be safely disposed of in a secure landfill.



**Tip:** The first paragraphs of the *TCLP* list some shortcuts. For example, if a total analysis for a waste shows it is impossible to exceed a listed leachate level, there is no need to use the procedure. Testing laboratories should be able to advise on other cases where the procedure does not have to be used.

**Waste Containing Tetrachloroethylene**

The HW Regulation defines *waste containing tetrachloroethylene* as: waste containing tetrachloroethylene in a concentration greater than 500 parts per million by weight.



**Note:** Wastes containing large amounts of tetrachloroethylene could be dangerous goods under the TDG Regulations. The most likely class would be 6.1.

**Schedule 7 Wastes**

The HW Regulation defines 100 types of wastes listed in Schedule 7 of the regulation as hazardous waste. The wastes listed in Schedule 7 are mainly wastes from processes.



**Note:** Many of the process wastes listed in Schedule 7 could be dangerous goods under the TDG Regulations. The most likely classes would be 3, 6.1, or 8.

**Waste Containing Polycyclic Aromatic Hydrocarbon**

The HW Regulation defines *waste containing polycyclic aromatic hydrocarbon* (PAH) as: waste containing PAH in a total concentration greater than 100 parts per million measured as PAH TEQ by weight.

*PAH TEQ* (toxicity equivalent) is a number that allows the toxicity of substances containing different PAHs to be compared. PAH TEQ is the amount of benzo[a]pyrene a substance would have to contain to have the same toxicity as the substance containing the different PAHs. Section 1 of the HW Regulation describes how to calculate PAH TEQ.

In summary, PAH TEQ is calculated by:

- multiplying the concentration of each compound listed in Schedule 1.1 of the HW Regulation by its toxicity equivalency factor (TEF) and then
- adding all of the multiplied numbers together

If a measured concentration is below the detection limit of the analytical method, the concentration is assumed to be half of the detection limit.



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**Note:** The PAH TEFs listed in Schedule 1.1 have been updated. See [Order in Council No. 747](#) posted on the Ministry's web site for the new values effective 1 November 2017.



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**Note:** Wastes containing PAH could be dangerous goods under the TDG Regulations. The most likely classes would be 4, or 6.1.



---

**Penalties:** Improper classification of hazardous waste may lead to a variety of offences. Anyone not complying with a requirement for hazardous waste may be:

- fined up to \$1 000 000 and/or
- imprisoned for up to six months

Each day that an offence continues may result in another fine up to the maximum amount. See Part 10 of the *EM Act* or [Figure 17, Offences and Penalties](#), in Chapter 20.

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## 6.0 Names for Hazardous Wastes

For management purposes and to assist emergency response personnel, all hazardous wastes must be properly named.



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**Note:** Wastes cannot be properly named without going through the [Waste Classification Procedure](#) described in Section 5.0 of this chapter.

### 6.1 Hazardous Wastes That Are Dangerous Goods

#### General Rules

A UN number listed in Column 1 and a shipping name listed in Column 2 of Schedule 1 of the Transportation of Dangerous Goods (TDG) Regulations must be used for any waste that is dangerous goods.



---

**Tip:** Schedule 3 lists shipping names in alphabetical order with a cross-reference to the United Nations (UN) number. If looking for possible shipping names, Schedule 3 is usually quicker to search than Schedule 1. Schedule 1 must then be checked for full information.

---

All shipping names are written in upper case letters (capitals). Any text used to further describe a listed substance is written in lower case letters. The word "or" between shipping names indicates that any of the shipping names may be used.

Shipping names may be:

- written in the singular or the plural
- followed by the descriptive text if the descriptive text is in lower case letters and the shipping name is in upper case letters or
- put in a different word order as long as the full shipping name is used and the word order is a common one

The use of a different word order is only allowed for shipping names in English.

For example, for UN1826, the following are all correct shipping names:

- Nitrating acid mixture, spent
- Spent nitrating acid mixtures and
- SPENT NITRATING ACID MIXTURE with not more than 50 per cent nitric acid

### **Specific Shipping Names**

The shipping name of a substance that is specifically listed in Schedule 1 is used for waste that:

- is accurately described by the shipping name and
- has properties so that the classification of the waste is exactly the same as the classification of the listed substance

If more than one shipping name describes a substance, the most specific shipping name must be used.

### **Solutions and Mixtures**

In the TDG Regulations, the words *solution* and *mixture* are more restricted in meaning than in general usage. Unless they are already part of a shipping name, they mean only **one** of the dangerous goods specifically listed in Schedule 1 dissolved in water or mixed with another non-hazardous substance.

Some shipping names are specifically for solutions. Examples are:

- zinc chloride solution or
- ammonia solution

Such shipping names must be used if they apply.

In cases where solution or mixture is not part of a shipping name, the shipping name of a specifically listed substance must be used for solutions or mixtures of the substance, **as long as** the solution or mixture has properties so its classification **is exactly the same as** the classification of the listed substance. This means that the solution or mixture must have the same class and packing group as the specifically listed substance.

## **Ex**

**Example:** What is the shipping name for a waste that is mostly gasoline but that contains dirt and water?

Neither dirt nor water is hazardous, so this is a mixture in the sense used by the TDG Regulations. In addition, if the mixture is mostly gasoline, the mixture will have the same flashpoint as normal gasoline. The mixture will therefore be in the same class and packing group as normal gasoline. The shipping name for this waste mixture is therefore: Gasoline.





**Note:** At the time of revising this guide, it is not technically correct to add the word *waste* to a shipping name when filling out the shipping document required by the TDG Regulations.

However, it is correct to add the word *waste* before the shipping name when filling out a manifest required by the HW Regulation, if this is not already part of or implied by the shipping name.

---

If a solution or mixture of a specifically listed substance no longer has exactly the same classification as the listed substance, then a generic shipping name must be used as described below. A generic shipping name must also be used for a mixture of two or more specifically listed substances.

### **Generic Shipping Names**

A generic shipping name must be used for dangerous goods if no specific shipping name applies. Examples are:

- Solids containing a corrosive liquid, n.o.s.
- Corrosive liquid, flammable, n.o.s. and
- Environmentally hazardous substance, solid, n.o.s.

The abbreviation “n.o.s.” means *not otherwise specified*.

---



**Note:** Most generic shipping names must be completed by adding the technical name of the most dangerous substance that causes the substance to be dangerous goods. Generic shipping names that must be completed in this way are shown by special provision 16 (the number 16 listed in Column 5 of Schedule 1).

### **Ex**

**Example:** What is the shipping name for a waste sorbent used to soak up a spill of fluid from a lead-acid battery?

The waste sorbent is not a fluid, so a shipping name such as Battery Fluid, Acid does not accurately describe the waste.

The listing that most accurately describes the waste is UN3244, solids containing corrosive liquid, n.o.s. The classification for this listing is class 8 (corrosive), packing group II. Special provisions 16 and 58 apply to this listing.

With some exceptions which are not applicable here, special provision 16 requires the shipping name to be completed by adding the technical name of at least one of the most dangerous substances that cause the substance to be dangerous goods. For acid battery fluid, this is sulphuric acid.

Among other things, special provision 58 says that if the fluid in the solid is known to be in class 8, the solid containing the fluid does not have to be tested to check that it exceeds the criteria for class 8 and packing group II.

So for this waste, the complete shipping name is: Solids containing corrosive liquid, n.o.s. (sulphuric acid).

**Ex** **Example:** What is the shipping name for waste alcoholic potassium hydroxide used for degreasing laboratory glassware?

This waste contains two specifically listed dangerous goods. There is no specific listing for this substance. Two listings that describe this waste in general terms are:

- UN2920, Corrosive liquid, flammable, n.o.s. and
- UN2924, Flammable liquid, corrosive, n.o.s.

The flashpoint of ethyl alcohol is about 13 °C. The potassium hydroxide does not change this very much, so the waste is in class 3 (flammable), packing group II.

All skin layers can be destroyed if alcoholic potassium hydroxide is left in contact with them for between 3 and 60 minutes, so the waste is class 8 (corrosive), packing group II.

The rules of precedence in section 2.8 of the TDG Regulations show that for this combination of hazards, flammability is the more serious hazard. Class 3 is therefore the primary classification and the substance causing this classification is the alcohol.

Class 3 is the primary classification for UN2924 and special provision 16 applies to UN2924. So the full shipping name is: Flammable liquid, corrosive, n.o.s. (ethyl alcohol).

## 6.2 Hazardous Wastes That Are Not Dangerous Goods

Use the name that applies to the waste as given in the definition of hazardous waste and as discussed in step 5 of the [Waste Classification Procedure](#) in Section 5.0 of this chapter.

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**Ex** **Example:** What is the shipping name for waste hydraulic oil?

If good practices are followed to prevent flammable substances from being added to the oil (especially when it is waste), it is reasonable to assume that it is not flammable and the shipping name is: Waste oil.

**Ex** **Example:** What is the shipping name for soil containing 5% oil and no other contaminants?

Although this soil qualifies for management as *hydrocarbon contaminated soil*, this is not a name used in the definition of hazardous waste. The shipping name is: Waste oil.

**Ex** **Example:** What is the shipping name for waste sawdust containing a pesticide where the waste is not dangerous goods, but where the waste has an aquatic toxicity of 100 mg/L?

The aquatic toxicity of a substance is the concentration of the substance in water that kills a specified percentage of a specified organism in a specified time. The lower the number, the more toxic a substance is.

Because the example waste is more toxic than the limit of 500 mg/L given in section 42 of the HW Regulation, the shipping name is: Waste containing pest control products.

**Ex**

**Example:** What is the shipping name for soil from a creosote operation that:

- contains only traces of contaminants, and
- produces a leachate containing 0.1 mg/L of benzo[a]pyrene when tested according to the *TCLP*

Substances that produce a leachate concentration more than 0.001 mg/L of benzo[a]pyrene when tested according to the *TCLP* are leachable toxic waste.

Since the soil contains only traces of contaminants, the shipping name is:  
Leachable toxic waste (benzo[a]pyrene).

**Figure 1: Definition of Waste**

*Waste* includes:

- air contaminants
- litter
- effluent
- refuse
- biomedical waste
- hazardous waste or
- any other substance prescribed by the Lieutenant Governor in Council or the minister under section 22, or, if either of them prescribes circumstances in which a substance is a waste, a substance that is present in those circumstances

The types of waste referred to above are defined as waste whether or not they have any commercial value or are capable of being used for a useful purpose.

Figure 2: Definition of Hazardous Waste

<p><b>Types of wastes defined as hazardous wastes</b></p>	<p><i>Hazardous waste means:</i></p> <ul style="list-style-type: none"> <li>• dangerous goods if they             <ul style="list-style-type: none"> <li>○ are no longer used for their original purpose, and</li> <li>○ meet the criteria for class 2, 3, 4, 5, 6, 8, or 9 of the Transportation of Dangerous Goods Regulations,</li> </ul>             including those that are recycled, treated, abandoned, stored or disposed of, intended for recycling, treatment, or disposal or in storage or transit before recycling, treatment, or disposal           </li> <li>• PCB wastes</li> <li>• biomedical wastes</li> <li>• wastes containing dioxin</li> <li>• waste oil</li> <li>• waste asbestos</li> <li>• waste pest control product containers and wastes containing pest control products, including wastes produced in the production of treated wood products using pest control products</li> <li>• leachable toxic waste</li> <li>• waste containing tetrachloroethylene</li> <li>• wastes listed in Schedule 7</li> <li>• waste containing polycyclic aromatic hydrocarbon, or</li> <li>• on site media that is stored ex situ unless the on site media is stored for one of the following purposes:             <ul style="list-style-type: none"> <li>○ transport from the contaminated site within 60 days, or a different period approved by the director, from the date when the on site media was physically removed or excavated from where it originated</li> <li>○ remediation activities that involve the handling, management or treatment of contamination in accordance with the Contaminated Sites Regulation, or</li> <li>○ another approved purpose</li> </ul> </li> </ul>
<p><b>Types of waste excluded from definition as hazardous waste</b></p>	<p>Hazardous waste does not include:</p> <ul style="list-style-type: none"> <li>• household refuse that is collected from residential premises</li> <li>• domestic sewage</li> <li>• dangerous goods that are defective, surplus, or otherwise not usable for their intended purpose and that are in the process of being returned directly to a manufacturer or supplier</li> <li>• asphalts and tars used in the manufacture of asphaltic concrete and roofing materials</li> <li>• waste wood products treated with wood preservatives or wood protection products registered under the <i>Pest Control Products Act</i> (Canada)</li> <li>• household hazardous waste that:             <ul style="list-style-type: none"> <li>○ is removed from a return collection facility in accordance with an authorization from the owner of the return collection facility and</li> <li>○ is to be reused for its originally intended purpose</li> </ul> </li> <li>• wood ash, or pulp mill dregs and grit, that would be hazardous waste only because they are classified under the federal dangerous goods regulations as class 8</li> <li>• waste that             <ul style="list-style-type: none"> <li>○ has a pH greater than or equal to 2.0 and less than or equal to 12.5, and</li> <li>○ would be a hazardous waste only because it is classified under the federal dangerous goods regulations as class 8 because of pH, or</li> </ul> </li> <li>• on site media</li> </ul>

Figure 3: Classification Flowchart

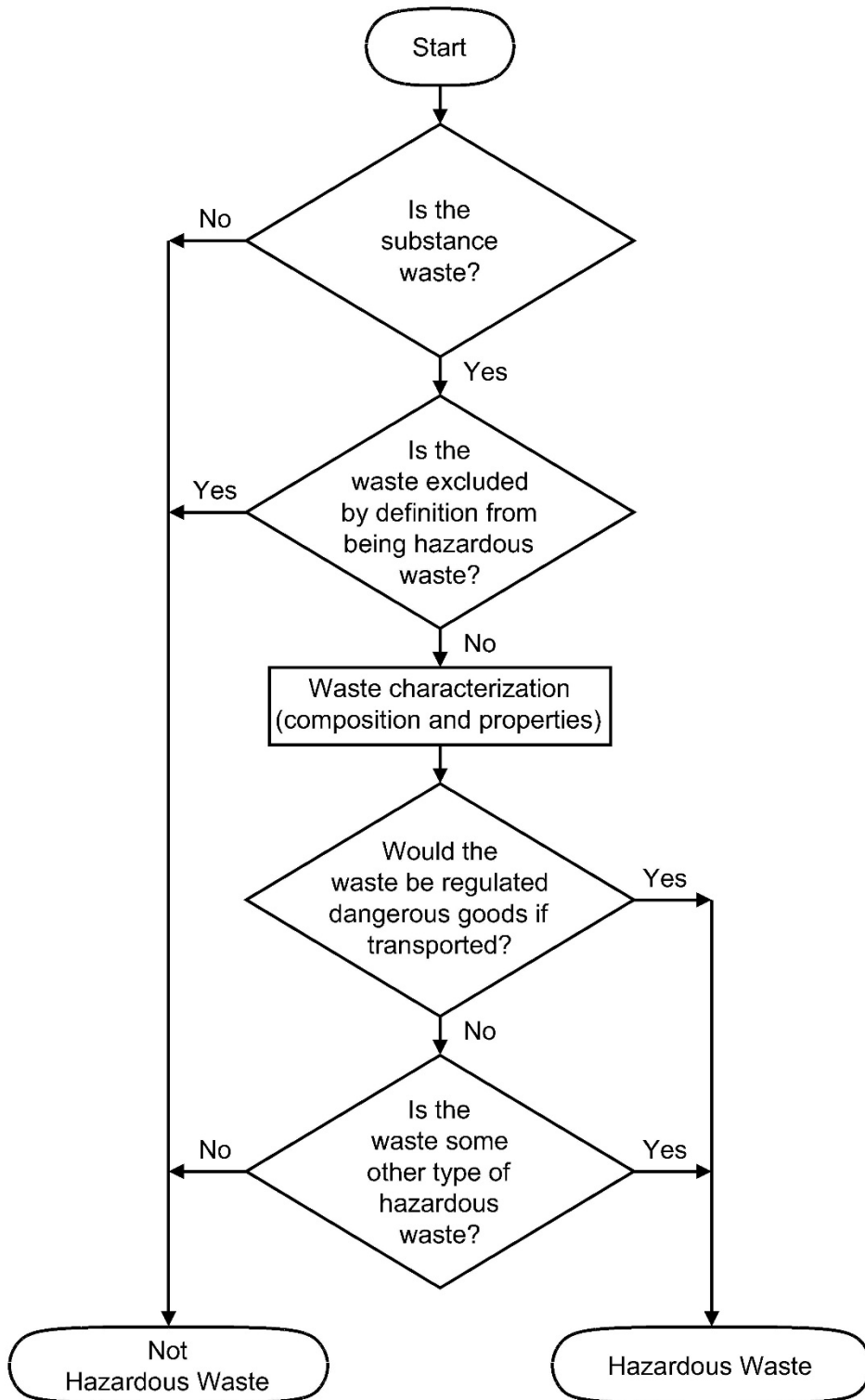


Figure 4: Summary of TDG Classes for Wastes

<i>Class</i>	<i>Division</i>	<i>Description</i>	
2	Gases	2.1	Flammable gases
		2.2	Non-flammable, non-toxic, non-corrosive gases
		2.3	Toxic gases (includes corrosive gases)
3	Flammable Liquids	Liquids that have a flashpoint of 60 °C or less (some limited exemptions if the flashpoint is greater than 35 °C)	
4	Flammable Solids, Substances Liable to Spontaneous Combustion, and Substances That Emit Flammable Gases on Contact with Water	4.1	Solids that are: <ul style="list-style-type: none"> <li>• readily combustible</li> <li>• liable to cause fire during transport through friction</li> <li>• desensitized explosives</li> <li>• self-reactive or</li> <li>• specifically listed in Part 2 of the TDG Regulations</li> </ul>
		4.2	Substances that are: <ul style="list-style-type: none"> <li>• pyrophoric (catch fire within 5 minutes of contact with air) or</li> <li>• self-heating (catch fire after prolonged contact with air)</li> </ul>
		4.3	Substances that: <ul style="list-style-type: none"> <li>• on contact with water give off flammable gases at a dangerous rate or</li> <li>• catch fire while being tested</li> </ul>
5	Oxidizing Substances and Organic Peroxides	5.1	Substances that make other substances burn more easily by yielding oxygen
		5.2	Substances that: <ul style="list-style-type: none"> <li>• are thermally unstable organic compounds containing oxygen in a "-0-0-" structure</li> <li>• are liable to decompose at increasing rate while giving off heat</li> <li>• are liable to decompose explosively</li> <li>• burn rapidly</li> <li>• are sensitive to impact or friction</li> <li>• react dangerously with other substances</li> <li>• cause damage to the eyes or</li> <li>• are listed in the <i>UN Recommendations</i>†</li> </ul>
6	Toxic and Infectious Substances	6.1	Substances that are liable to cause death or serious harm to human health if they: <ul style="list-style-type: none"> <li>• are swallowed</li> <li>• are breathed in or</li> <li>• come into contact with skin</li> </ul>
		6.2	Substances that are infectious
8	Corrosive Substances	Substances that: <ul style="list-style-type: none"> <li>• destroy or are known to destroy all layers of human skin or</li> <li>• are corrosive to metal when tested as specified in Part 2 of the TDG Regulations</li> </ul>	
9	Miscellaneous Dangerous Goods	Substances that: <ul style="list-style-type: none"> <li>• are listed as class 9 in Schedule 1 of the TDG Regulations</li> <li>• are marine pollutants as specified in section 2.7 of the TDG Regulations</li> </ul>	

† *Recommendations on the Transport of Dangerous Goods, 17th Revised Edition, 2011, United Nations*







# REGISTRATION

Section 43 of the Hazardous Waste (HW) Regulation requires any person in BC who carries out activities involving more than a *prescribed* quantity of hazardous waste to register with a director.

As elsewhere in this guide and unless noted otherwise, the word *person* is used in the legal sense and includes proprietorships, partnerships, and companies.

The activities requiring registration are explained below in Section 1.0, [Activities Requiring Registration](#).

The quantities that are prescribed are explained further down in Section 2.0, [Registration Quantities](#).

Registration is an important part of the cradle-to-grave management of hazardous waste and allows waste managers to make policy and operational decisions based on facts rather than speculation.

The only situations that do not require registration are:

- transport of hazardous wastes into the province by generators outside BC or
- on-site recycling without any storage

## 1.0 Activities Requiring Registration

The regulation divides activities involving more than a prescribed quantity of hazardous waste into two groups:

- those requiring registration and application for a generator registration number (BCG number):
  - production in a 30-day period or
  - storage at any time at an on-site facility and
- those requiring registration and application for a registered site number:
  - storage at any time at an off-site facility
  - treatment
  - recycling or
  - disposal

### ***Immediate Treatment or Disposal***

Hazardous wastes must be registered even if they are immediately treated or disposed of without storage. In this case, the generator works out how much waste is generated over a 30-day period and registers that quantity.

### **Ex**

**Example:** A forest company produces a small amount of contaminated sawdust from a spray booth operation. The sawdust is hazardous waste. The waste is collected daily and burned in a high-temperature boiler. Does the company need to register?

The company must measure or estimate the amount of contaminated sawdust produced in a 30-day period. If the amount is more than the prescribed amount for that type of hazardous waste (100 kg for wastes containing pest control products), the company is required to register the waste.

**Generators Outside BC** Generators outside BC who transport hazardous waste into the province do not need to register their wastes. However, these generators are encouraged to register voluntarily if they regularly ship hazardous wastes to BC. In this way their types and quantities of hazardous waste are included in the registration database.

When making a voluntary registration, out-of-province generators should indicate the registration number, if any, issued by their own jurisdiction. This number should be used in all correspondence with the Environmental Protection Division.

**On-Site Recycling Without Intermediate Storage**

Hazardous waste that is recycled on site without intermediate storage does not need to be registered. This exemption is intended to encourage on-site recycling wherever possible. In this context, holding tanks that are used to even out flow variations or for process reasons are not usually considered to be intermediate storage.

Hazardous wastes recycled on site do not have a significant impact on the waste management system. For this reason, information on them is not needed for policy or operational decision-making.

## 2.0 Registration Quantities

The *prescribed* quantity of a hazardous waste that must be registered is usually called the registration quantity. The registration quantity for a hazardous waste varies according to the hazard of the waste. Registration quantities are shown in [Figure 5, Registration Quantities](#).

In general, the registration quantity is the amount in the *Registration Quantity* column across from the type of waste shown in the *Waste Type* column. For liquids, the amount is in litres and for solids, it is in kilograms.

**Named Wastes**

When finding the registration quantity for a hazardous waste, look in the upper part of [Figure 5](#) first. If the waste is one of the *Named Wastes*, use the corresponding registration quantity.

Step 5 of the [Waste Classification Procedure](#) in Chapter 3 or section 1(1) of the HW Regulation gives the definition of each named waste type.




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**Note:** When finding the registration quantity, it does not matter if the hazardous waste is classified according to the Transportation of Dangerous Goods (TDG) Regulations. Use the quantity for a named waste type if the definition fits the waste.

---

**Classified Wastes**

If a hazardous waste is not one of the *Named Wastes*, find the registration quantity in the lower part of [Figure 5](#) corresponding to the class the waste is in.

Step 4 of the [Waste Classification Procedure](#) in Chapter 3 describes how to find out which class(es) a hazardous waste is in.

**Wastes in More Than One Class**

If a hazardous waste is in more than one class, the registration quantity is the smallest of the registration quantities for any of the classes the waste is in.

---

**Ex**

**Example:** What is the registration quantity for waste methanol?

Waste methanol is not one of the named waste types in the upper part of [Figure 5](#), so none of the registration quantities for those wastes apply.

For example purposes, whatever has made the methanol waste has not affected its properties. So, the waste is in classes 3 and 6.1 [Schedule 1 of the TDG Regulations for listing UN1230].

From [Figure 5](#) the registration quantity for class 3 is 500 L and for class 6.1 is 100 L. The registration quantity is the lesser of these amounts, which is 100 L. This is the case even though class 3 is the primary classification.

---

### 3.0 Allowable Time for Registration

Registration must be made within 30 days of the beginning of an activity that requires registration.

If a test is needed to see if the amount of hazardous waste generated in a 30-day period is more than the registration quantity, then the waste must be registered within 30 days of the end of the test period.

### 4.0 Form for Registration

Use [Form 1, Registration](#), to register a hazardous waste and apply for a generator registration number, or to register a hazardous waste and apply for a site registration number. The form may be downloaded from the Hazardous Waste section of the Ministry's web site or is available from any office of the Regional Operations Branch. Addresses and telephone numbers for these offices are listed in [Appendix A](#).

If a company has more than one site, each site must be registered by completing a separate *Registration* form.

#### ***Instructions for Completing the Form***

For additional details on completing the form, see the [Guideline to Generator's Registration \(BCG\) Applications](#) available from the Hazardous Waste section of the Ministry's web site.

All registration forms must be certified by a natural person (not a company). The certifying person may be an employee or an agent of the hazardous waste generator.

Agents who certify registration forms must:

- have knowledge of day-to-day changes in the quantity, composition, generation process, and method of management of the hazardous waste and
- add the name of their company after their name

#### ***Form Submission***

Submit the completed *Registration* form by:

- email to [BCGregistrations@gov.bc.ca](mailto:BCGregistrations@gov.bc.ca) (preferred), or
- fax to 250-356-0299

By registering within 30 days, a generator also complies with section 9(2) of the *Environmental Management Act*.



**Penalties:** Anyone not complying with a requirement of the HW Regulation may be:

- fined up to \$1 000 000 and/or
- imprisoned for up to six months

Each day that an offence continues may result in another fine up to the maximum amount.

## 5.0 After Registration

### **Confirmation of Receipt**

A letter is sent to the generator to confirm receipt of the *Registration* form. In this letter, the generator or registered site owner can expect to be asked to manage the hazardous waste according to the HW Regulation.

### **Technical Review and Data Entry**

The registration is reviewed by staff from the Environmental Protection Division. If anything needs to be clarified, the generator may be contacted. The data on the registration form is then entered into a computerized database.

### **Provincial Identification Number**

A unique five-digit *Provincial identification number* is issued to the generator when the data is entered. For generators, the Provincial identification number is also known as a *BCG number* or a *generator registration number*. For registered facilities, the Provincial identification number is also known as a *registered site number* or *RS number*.

The Provincial identification number must be used in the correct box/place on all manifests and other correspondence related to transporting or managing hazardous waste. It is used to prevent errors in identifying the generator.

## 6.0 Changes to Registration Information

Registration information must be kept current. An update must be submitted within 30 days of a change in any of the following:

- generator legal name
- generator legal address
- the maximum amount of hazardous waste managed at a site is more than 10% above the registered amount
- hazardous waste properties or description
- handling method
- generation site address
- company managing the hazardous waste or
- management site address

## 7.0 Updating Registration Information

Use another copy of [Form 1, Registration](#), to update registration information.

Follow the instructions for completing and submitting the form as for the initial registration.



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**Note:** The system that a generator uses for managing hazardous waste may be reassessed after an update is submitted. This is more likely for updates where there is a change in quantity, waste classification, or handling practice. Improvements to a facility may be required if a director thinks this is necessary.

However, a generator must not wait for action by a director. The generator is responsible for making sure that hazardous waste is managed at all times according to the *EM Act* and the regulations.

---

***Access to Information***

Statistics and similar non-confidential data are normally made available to anyone upon request.

**Figure 5: Registration Quantities**

From HW Regulation Schedule 6

	<b>Waste Type</b>	<b>Registration Quantity</b> (kg or L as appropriate)
<b>Named Wastes</b>	Biomedical waste	100
	Waste containing dioxin	5
	Waste oil or waste oil contaminated with lead	5000
	Waste asbestos	1000
	Waste pest control products and wastes containing pest control products	100
	Leachable toxic waste	500
	Waste containing tetrachloroethylene	200
	Waste containing polycyclic aromatic hydrocarbon	5
	Waste listed in Schedule 7	100
	Pest control product containers	500*
	Batteries that are hazardous waste	2000
<b>TDG Classified Wastes</b>	Class 2.1	500*
	Class 2.2	1000*
	Class 2.3	50*
	Class 3	500
	Class 4.1	1000
	Class 4.2	100
	Class 4.3	100
	Class 5.1	100
	Class 5.2	5
	Class 6.1	100
	Class 6.2	100
	Class 8	100
	Class 9	500

\* Total liquid capacity of containers



# CONTAINERS FOR HAZARDOUS WASTE

Containers are used in the storage and transportation of hazardous waste.

The Hazardous Waste (HW) Regulation defines a *container* as: a portable receptacle in which waste is stored, transported, treated, disposed of, or otherwise handled.

## 1.0 General Requirements

Section 50 of the HW Regulation specifies general requirements for containers. The intent is to make sure that hazardous waste is contained during storage or transport. The requirements apply to things like transformer carcasses used for storage or transport of hazardous waste even if they may not be thought of as containers.

### **Compatible Materials**

Sound containers that are compatible with their contents must be used. Materials are considered to be compatible if, under normal conditions of storage or transport:

- release of hazardous waste does not occur
- no heat, gas, corrosive, or toxic substance is given off and
- the effectiveness of the packaging is not reduced

Putting hazardous waste into a container is prohibited if the waste is incompatible with:

- another waste in the container
- a residue left in an unwashed container
- the container itself
- a packing material or
- any other substance in the container

### **Closure, Labelling and Handling**

Containers of hazardous waste must be kept closed at *all times during storage or transport*. This means containers must be closed except when they are filled or emptied.

In addition, each container must be:

- labelled with the shipping name of the hazardous waste it contains and
- stored, transported, and handled in ways that avoid leakage or rupture

### **Prohibited Use for Food Storage**

Most important of all, storage of food, feed, or any product that may become part of the human or animal food chain is prohibited in a container that has residues of hazardous waste in it.

### **Dangerous Goods**

Where hazardous wastes that are dangerous goods are transported, all of the requirements in Part 5 of the Transportation of Dangerous Goods (TDG) Regulations also apply. These include:

- the way containers are selected and used
- standards the containers may have to comply with
- labelling with the class and UN number of the hazardous waste
- display of certification marks
- filling limits

- loading and securing containers for transport and
- requalification of containers which are reused

Section 5.0, *Waste Classification Procedure*, in Chapter 3 explains how to check if wastes are dangerous goods.



**Note:** Section 17.1 of the HW Regulation specifies special requirements for containers used to store PCB wastes. These requirements are discussed in Chapter 10 of this guide.

## 2.0 Labpacks

**Definition** The HW Regulation defines a *labpack* as: a drum or barrel with a maximum capacity of 454 L that:

- is used to transport several containers of hazardous waste for storage, recycle, or disposal and
- includes one or more inner linings that contain absorbent or cushioned packaging for safe storage or transport of the containers of hazardous waste

**Construction** Labpacks must:

- be made of metal
- be open-topped
- have a tight-fitting lid and gasket and
- have a liner not less than 4 mil thick

**Packing** Small containers put into labpacks must:

- be securely sealed
- not be leaking
- be inside a clear plastic bag not less than 4 mil thick if the waste is a liquid
- have a label with the correct shipping name to identify the contents and
- have the void spaces between containers filled with inert absorbent packing material such as vermiculite to act as a cushioning agent and to soak up any leakage of liquids

**List of Contents** A list must be kept of the contents and size of all small containers in the labpack. The list of contents must be:

- available for inspection by an officer while the labpack is in storage
- attached to the manifest when the labpack is transported and
- sent by the consignee (receiver) with the appropriate copy of the manifest to the Hazardous Waste Program of the Ministry of Environment



**Penalties:** A person may be:

- fined up to \$1 000 000 and/or imprisoned for up to six months for not complying with a requirement of the HW Regulation or
- fined up to \$3 000 000 and/or imprisoned for up to six months for reckless disregard for safety causing harm

Each day that an offence continues may result in another fine up to the maximum amount.



### 3.0 Other Precautions

In addition to the above requirements, certain general safety precautions are recommended when dealing with hazardous wastes in containers.

**Reuse of Containers**

Containers may be reused for other hazardous waste shipments if:

- they are in good condition and
- any requalification requirements are met for wastes that are dangerous goods (see Part 5 of the TDG Regulations)

**Disposal of Containers**

If reuse or recycle of containers is not practical, they may be disposed of at a permitted disposal facility such as a municipal landfill provided that they:

- no longer contain enough waste to qualify as a hazardous waste or
- have been properly decontaminated with a suitable solvent (see Section 4.0, [Wastes Containing Pest Control Products](#), in Chapter 18)

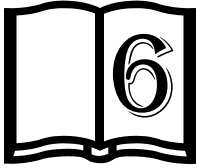
**Repacking**

Pouring material from one container to another increases the chance of spills and exposure to hazardous chemicals. Avoid repacking unless it is essential, such as when a container is leaking and no salvage drum is available.

**Good Hygiene**

Wear proper protective clothing and equipment when handling hazardous wastes. Use good hygiene procedures to avoid ingestion, absorption, and contact with hazardous wastes. Do not smoke, eat, or drink when handling hazardous wastes. Wash and clean up after handling hazardous waste.





# TRANSPORTING HAZARDOUS WASTE

Shippers (consignors/generators), carriers, and receivers (consignees) of hazardous wastes have many responsibilities, including those set out in:

- Section 10 of the *Environmental Management (EM) Act*
- Hazardous Waste (HW) Regulation
- *Transportation of Dangerous Goods (TDG) Act* and Regulations
- *Canadian Environmental Protection Act*
- Export and Import of Hazardous Waste and Hazardous Recyclable Material (EIHWHRM) Regulations and
- Interprovincial Movement of Hazardous Waste (IMHW) Regulations

These responsibilities include:

- use of Provincial identification numbers
- licences for carrying hazardous wastes by road
- providing notification and getting authorization for international shipments
- making sure receivers are allowed to receive hazardous wastes
- documentation of the shipment using manifests and other forms
- labelling and placarding of shipments
- training of personnel and
- verifying the waste was received as intended

The *prescribed* quantity for transporting hazardous waste is usually called the manifest quantity. The manifest quantity for a hazardous waste varies according to the hazard of the waste. Manifest quantities are given in Section 5.1, [When to Use a Manifest](#) in this chapter.

This chapter provides more details on the responsibilities of a person transporting hazardous waste.

Details of other important responsibilities are given in previous chapters, including:

- waste characterization and classification ([Chapter 3](#))
- registration ([Chapter 4](#)) and
- containers for hazardous waste ([Chapter 5](#))



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**Note:** In this chapter, the term *shipper* means the person who is shipping hazardous waste. In legal documents, the shipper is called the consignor.

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## 1.0 Provincial Identification Numbers

Under section 44 of the HW Regulation, a person must not offer for shipment or ship more than the registration quantity of a hazardous waste, without having a *Provincial identification number*. For generators/shippers the Provincial identification number is also known as a *BCG number* or *generator registration number*.

BCG numbers are issued as part of the registration process. Shippers who have a BCG number must use it any time they ship hazardous waste. If a shipper does not have a BCG number and the amount of hazardous waste to be shipped is more than the registration quantity, the shipper must register the waste and get a BCG number before shipping it.

If a shipper does not have a BCG number and the amount of hazardous waste to be shipped is less than the registration quantity, the waste may be shipped without a BCG number by filing in *not applicable* for the shipper's Provincial identification number.



**Note:** The BCG number is issued to the person or company *responsible* for the hazardous waste. For example, if hazardous waste is generated during demolition of a building by a contractor, the owner of the building is responsible for the waste. See [Chapter 4](#) for a discussion of registration, including [Figure 5](#), which shows registration quantities for different types of hazardous wastes.

## 2.0 Transporting Hazardous Waste by Road

### 2.1 Transport Licence

#### **Requirement for a Licence**

Under section 45 of the HW Regulation, a person carrying hazardous waste by road must in most cases have a transport licence issued by a director. The transport licence number is the carrier's Provincial identification number.

A transport licence is not needed if:

- the amount of waste or the transport distance is so small that a manifest is not required (see Section 5.1, [When to Use a Manifest](#), later in this chapter)
- the waste is carried solely on a property controlled by the person storing or generating the waste
- the waste is carried by the person who generated it and the amount is smaller than the registration quantity for the type of waste concerned or
- the waste is not carried by road

To get a licence, applicants must show they have:

- a good knowledge of the regulations, based on a written test and
- adequate resources in the form of insurance and/or a security deposit to cover the costs in event of an accident or spill

If an applicant intends to carry only to a limited number of receiving facilities, it helps to have a letter from each receiving facility to confirm they can accept the type of hazardous waste(s) to be carried.

Transport licences are issued by a director to the person or party responsible for the carrying function. In most cases, this is a company rather than an employee driver.

A copy of the licence must be kept in the cab when a vehicle is carrying hazardous wastes.

#### **Application Forms and Information**

All the forms and information to apply for a *Licence to Transport Hazardous Waste* can be downloaded from the [Hazardous Waste](#) section of the Ministry's web site. They are also available as a hard copy package from staff of the Hazardous Waste Program in Victoria.

The application package includes:

- an application form and instructions
- details of the security required
- form letters for receivers to confirm the types of waste they can accept and
- this guide as study material for the written test

***Making the Application***

Make an appointment for and then write the test.

Complete the application form and then send the following to the Director, Environmental Management Branch in Victoria:

- the completed application form
- a copy of each vehicle's registration certificate or a list of the fleet
- proof of third party liability insurance in the amount advised
- acceptable financial security
- a contingency plan for spills prepared according to the instructions in the application package
- confirmation letters from receiving facilities if applicable
- any required licence fee and
- any additional information the director may ask for

***Powers of a Director***

If a director is not satisfied that a carrier has the required knowledge, experience, or equipment to carry some types of hazardous waste, the director may:

- refuse to issue a transport licence for those wastes or
- place conditions on a licence to limit certain aspects of operation

A director may cancel or suspend a *Licence to Transport Hazardous Waste* if the holder of the licence does not comply with the *EM Act* or the regulations. Before a transport licence is suspended or cancelled, the licence holder may ask to make representations to the director or the director may hold a hearing on the matter.

A licence is void if hazardous wastes are carried in circumstances that are significantly different from the information provided in the application.

**2.2 Delivering Hazardous Waste**

A person having a transport licence must not deliver hazardous waste to a facility unless that facility is an authorized consignee—see Section 4.0, [Authorization to Receive Hazardous Wastes](#) below.

**3.0 International Shipments*****Background***

Canada has signed or supports international agreements to prevent problems when hazardous wastes are imported into, exported from, or pass through Canada. The regulatory mechanisms for doing this are provided by the Export and Import of Hazardous Waste and Hazardous Recyclable Material (EIHWHRM) Regulations.

***Outline***

The requirements under the EIHWHRM Regulations vary somewhat according to the type of wastes, what is to be done with them, and whether the movement is import, export, or transit. In general, the process consists of:

- notifying Environment Canada of the intended movement, including all relevant details
- checking by Environment Canada and other authorities that:

- the movement is accepted and in accordance with the laws of all countries involved
- the parties involved are properly insured and authorized for what is intended and can do this without causing damage to human health or the environment and
- contracts for the movement include provisions for completing paperwork and for resolving problems
- issuing of written confirmation by Environment Canada that the proposed movement is accepted and
- moving the wastes in accordance with the contract conditions, applicable regulations, and terms of the confirmation issued by Environment Canada

See the [Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations \(EIHWHRMR\) User Guide](#) for further details.

**Notice** There are two ways to provide notice to Environment Canada:

- [Online Notification and Permit System](#) (preferred) or
- hard copy administrative notice forms

**Processing Time** Environment Canada has no control over the authorities who accept a proposed movement, so there is no defined time for processing a notification. It is suggested that the notice form be filed as soon as possible and at least 60 days before the proposed movement.

Confirmations that movements are accepted are usually valid for one year.



**Note:** The definition of hazardous waste in BC is not necessarily the same as in other provinces or for wastes crossing Canadian borders—be sure to check with the regulations of other jurisdictions as applicable.

## 4.0 Authorization to Receive Hazardous Wastes

Before shipping more than the registration quantity of a hazardous waste, a shipper must check that the receiving site is authorized to accept it. The receiving site must be an *authorized consignee* which means it must:

- have a registered site number and an operational plan approved by a director or
- a written authorization from a director to accept hazardous waste

The registered site number is the receiver's Provincial identification number.

A receiver may not accept hazardous waste if this will result in accumulation of more hazardous waste at the site than the site is authorized for by the *EM Act* and regulations.

## 5.0 The Manifest System

Section 10 of the *EM Act* requires use of a manifest to transport more than a *prescribed* quantity of hazardous waste. The shipper, carrier, and receiver must all use the manifest system.

The manifest is a key part of the system used to check that all hazardous wastes leaving a shipper's property are received safely at the intended destination. The system is often said to track the waste from cradle to grave.

**Required Forms** A manifest issued by the Ministry of Environment must be used for hazardous wastes shipped from sites in BC. These manifests and other forms used for transport are available only from the [Distribution Centre, Victoria](#). A fee is charged for manifests and other forms.

A manifest issued by Environment Canada or by another province may be used in place of one issued by BC for hazardous wastes shipped from outside of BC to the Province. A manifest issued by Environment Canada is called a *movement document*.

Manifests are forms with multiple colour-coded copies. All information for tracking shipments of hazardous waste is recorded on the manifest.

**Instructions for Manifests** Instructions for completing and distributing copies of a manifest issued by the Ministry are given on the back of the form. For additional details on completing and distributing the manifest, see the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#) available from the Hazardous Waste section of the Ministry's web site.

Instructions for completing and distributing copies of a movement document issued by Environment Canada or a manifest issued by another province are those given in the EIHWHRM Regulations or by the province concerned.

### 5.1 When to Use a Manifest

In most cases, a manifest is needed to transport:

- 5 kg or more of solid hazardous waste
- 5 L or more of liquid hazardous waste
- any quantity of gases in containers having a total liquid capacity of 5 L or more
- any quantity of solids or liquids containing 500 g or more of polychlorinated biphenyls (PCB) within BC or
- 500 g or more of solids, liquids, or mixtures of these containing 50 mg/kg of PCB outside of BC

A manifest is not needed for transport:

- solely within the boundaries of property owned, leased, or controlled by the person who produces or stores the hazardous waste, as long as the distance between the shipping and receiving sites is less than 100 km
- for a distance less than 3 km on a public road
- directly from a home or farm, by a home owner or farmer, to a facility operated by the government, a municipality, or an agent of these organizations
- of less than 210 L of waste oil or paint within BC or
- of less than 1000 kg of batteries that are hazardous waste within BC



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**Note:** The manifest quantities for waste oil, paint, or batteries apply even if these wastes are dangerous goods. However, transport of wastes that are dangerous goods may require a shipping document under the TDG Regulations, even if less than the manifest quantity.

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## 5.2 Responsibilities

The responsibility for completing and filing the manifest is divided between the shipper, the carrier, and the receiver. The *EM Act* prohibits a carrier or receiver from accepting more than the manifest quantity of hazardous waste unless there is a valid manifest with the shipment.

### **Shipper (Generator/Consignor)**

A person who owns or is responsible for a hazardous waste, and who wishes to ship the waste when a manifest is required, must:

- not allow or cause the waste to be transported unless it has been properly classified—see Section 5.0, *Waste Classification Procedure* in Chapter 3
- have and use his or her BCG number, if the amount also exceeds the registration quantity for the type of waste concerned
- complete Part A of the manifest according to the instructions on the back of the manifest and as further explained in the *Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms*
- make sure that the person transporting the waste has a *BC Licence to Transport Hazardous Waste* unless one is not needed (see Section 2.0 earlier in this chapter)
- make sure that the site that will receive the waste is allowed to accept it (see Section 4.0 earlier in this chapter)
- make sure that the carrier completes Part B of the manifest and takes copies 3 to 6 with the shipment
- file copy 1 and distribute other copies as described on the back of the manifest or the *Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms* and
- verify the waste was received as intended by matching copy 2 of the manifest retained by the shipper with copy 6 of the manifest returned by the receiver

If the receiver does not return copy 6 of the manifest promptly, the shipper must make reasonable efforts to get this copy. If the shipper is still unable to get the copy 6, the shipper must notify a director of this fact within 10 days of providing the manifest copies to the carrier.




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**Note:** The copies distributed must be the original coloured copies.

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The Ministry does not accept faxed copies of manifests.

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**Penalties:** A shipper failing to comply with manifest requirements, failing to make sure that a carrier has a transport licence, or failing to make sure that a receiving facility may accept a hazardous waste may be:

- fined up to \$200 000 and/or
  - imprisoned for up to six months
- 

### **Carrier**

Any person who is responsible for carrying hazardous waste must:

- not accept a waste to be transported unless it has been properly classified—see Section 5.0, *Waste Classification Procedure* in Chapter 3
- have a *BC Licence to Transport Hazardous Waste* unless one is not needed (see Section 2.0 earlier in this chapter)
- have a contingency plan to assist in responding to a spill or similar emergency



- complete Part B of the manifest according to the instructions on the back of the manifest and as further explained in the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#)
- carry copies 3 to 6 with the shipment and give them to the receiver when delivering the shipment and
- file copy 4 and pass on other copies to the receiver as described on the back of the manifest or the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#)

To deal with an emergency at any location and time, the contingency plan must identify:

- the chain of command
- means of communication to summon help
- response equipment and
- the sequence of actions

A recommended format for such plans is available from the Hazardous Waste section of the Ministry's web site – see [Appendix A](#) – or from Hazardous Waste Program staff in Victoria.



**Penalties:** A carrier failing to comply with manifest or transport licence requirements may be:

- fined up to \$200 000 and/or
- imprisoned for up to six months

### **Location of Manifest Copies in Transit**

While the shipment is in transit, at least one copy of the manifest must be kept as described according to the situation:

- Trucks, tractor attached (including on board a ship or ferry with the driver):
  - in a pocket on the driver's door or within the driver's reach while the driver is in the cab or
  - in a pocket on the driver's door, on the driver's seat, or in a location clearly visible from the driver's door if the driver is not in the cab
- Parked trailers, no tractor attached:
  - in a readily visible and accessible waterproof receptacle attached to or near the trailer if the trailer is in an unsupervised area or
  - with the person in charge of the area if the trailer is in a supervised area
- Ships and ferries (including wastes in a truck or railcar):
  - on the bridge of the ship with the master or master in control of the ship (can be as an electronic copy)
- Ports or marine terminals:
  - in the office of the port or marine terminal manager where the wastes are located, provided there is a person in the office who can immediately give details of the information on the manifest and a telephone number for the office that has been approved by CANUTEC
- Railcars, attached to a train (including on board a ship or ferry with the crew):
  - with one of the train crew if they are with the train or
  - in the first locomotive if none of the train crew are with the train

- Parked railcars, not attached to a train:
  - with the person in charge of the area if the car is in a supervised area
  - in the office of the rail dispatcher for the area where the car is located, provided there is a person in the office who can immediately give details of the information on the manifest and a telephone number for the office that has been approved by CANUTEC or
  - in a readily visible and accessible waterproof receptacle attached to or near the railcar if the car is in an unsupervised area

**Receiver  
(Consignee)**

Any person who receives hazardous waste must:

- not accept a waste unless it has been properly classified—see Section 5.0, *Waste Classification Procedure* in Chapter 3
- not accept more than the registration quantity of the waste unless allowed to do so (see Section 4.0 earlier in this chapter)
- complete Part C of the manifest received with the waste shipment according to the instructions on the back of the manifest and as further explained in the *Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms*
- return copy 4 of the completed manifest to the carrier and
- file and distribute other copies as described on the back of the manifest or the *Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms*

### 5.3 Problems with Received Shipments

A receiver must take further action if:

- a shipment arrives without a manifest
- the waste does not match the description on the manifest
- the amount received differs from the amount shown on the manifest by 5% or more

**No Manifest or  
Description Does  
Not Match**

If there is no manifest or the description does not match, the receiver must:

- immediately notify a director and
- seek authorization to accept the waste or wait for further instructions

**Amount Differs  
By More Than 5%**

If the amount of waste is more than 5% different from what is shown on manifest the receiver must:

- describe the discrepancy on the manifest
- send a copy of the manifest with the discrepancy noted to a director within three days of receiving the waste and
- the discrepancy in an annual report of discrepancies

**Annual Report of  
Discrepancies**

If any manifest discrepancies occur during a year, a receiver must:

- prepare a summary of all occurrences during the year, together with an explanation of actions taken to reduce further discrepancies and
- send this summary to a director within the first 60 days of the following year



**Penalties:** A receiver may be:

- fined up to \$200 000 and/or imprisoned for up to six months for accepting hazardous waste without a properly completed manifest or otherwise failing to comply with manifest requirements or
- fined up to \$300 000 and/or imprisoned for up to six months for accepting hazardous waste at a site where storage is prohibited or where treatment, recycling or introduction into the environment is not authorized

#### 5.4 Multiple Consignors

Section 47 of the HW Regulation provides an option for a single carrier to use one manifest when picking up the same type of hazardous waste in a bulk load from multiple shippers.

This is mainly to benefit recycling operations such as oil collectors, solvent reclaimers, or battery recyclers where a large number of pick-ups are made before a bulk load is complete.

**Required Forms** To use the multiple consignor option, the carrier must have a manifest and a multiple consignors form.

The carrier may use Form 3 of Schedule 5 of the HW Regulation or may use another form as long as it contains the same information.

See the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#) for details on:

- modifications to the completion of the manifest
- completion and distribution of the multiple consignors form

#### 5.5 Multiple Carriers

If more than one carrier is used for a single shipment to a receiving facility, the shipper must use a single manifest together with a multiple carriers form. This requirement is mainly to streamline the paperwork for inter-modal transport and is contained in section 47.1 of the HW Regulation.

**Required Forms** The shipper must have a manifest and a multiple carriers form.

The shipper may use Form 5 of Schedule 5 of the HW Regulation or may use another form as long as it contains the same information.

See the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#) for details on:

- modifications to the completion of the manifest
- completion and distribution of the multiple carriers form

### 5.6 Multiple Wastes

Section 47.2 of the HW Regulation provides an option for a shipper to use one manifest when there is not enough space on the manifest for all the hazardous wastes in the shipment. This option may only be used for cases where there is:

- one shipper
- one receiver and
- all waste is shipped to the receiver without any pick-ups or drop-offs

#### **Required Forms**

To use the multiple wastes option, the shipper must have a manifest and a multiple wastes form.

The shipper may use Form 6 of Schedule 5 of the HW Regulation or may use another form as long as it contains the same information.

See the [Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms](#) for details on:

- modifications to the completion of the manifest
- completion and distribution of the multiple wastes form

## 6.0 Safety Marks

The TDG Regulations calls containers or packages *means of containment*. In most cases, means of containment for shipments of hazardous wastes that are dangerous goods must have safety marks. Safety marks include:

- shipping names
- UN numbers
- labels
- placards
- certification marks or specifications and
- other markings and symbols

Part 1 of the TDG Regulations lists the special cases where marks are not required or different marks may be used.

The shipper is responsible for making sure that containers or vehicles are properly marked.

The carrier is responsible for making sure that the marks are maintained in good condition during transport.

Safety marks must stay on containers until they have been emptied and cleaned. When no hazard remains, the person doing the emptying or cleaning must cover or remove marks other than certification or specification marks.

Part 4 of the TDG Regulations specifies the designs, colours, and sizes of hazard/class labels and placards. Labels and placards are available from companies specializing in supplies for shipping dangerous goods.

#### **Small Containers and Packages**

The TDG Regulations define a *small means of containment* as having a cargo capacity of 450 L or less. Unless a special case allows something else, small containers used to transport hazardous wastes that are dangerous goods, or the small package they are in if they are packaged, must be marked with:

- shipping name (including the technical name of the most dangerous substance related to the primary class for listings that have special provision 16 in Schedule 1 of the TDG Regulations; see [Names for Hazardous Wastes](#) in Section 6.0 of Chapter 3)
- diamond-shaped hazard/class label for the primary class
- diamond-shaped hazard/class label(s) for any subsidiary class(es)
- UN number and
- certification mark if a standardized means of containment is required (see Part 5 of the TDG Regulations)

In addition, if a shipment will travel by ship or ferry and is or contains:

- a flammable liquid, it must be marked with the flashpoint or flashpoint range of the liquid and
- a marine pollutant or a severe marine pollutant, it may have to have a marine pollutant mark (see Part 4 of the TDG Regulations)

Safety marks must be arranged so that:

- they are on one side of a container or package, but not the top or bottom if the container or package may be stacked
- on the shoulder of a gas cylinder
- the shipping name (including technical name if applicable) is next to the primary label
- the UN number is on or next to the primary label
- subsidiary label(s) if applicable are next to the primary label
- the flashpoint or flashpoint range, if applicable, is next to the shipping name and
- a marine pollutant mark, if applicable, is next to the primary class label or the subsidiary class label(s) if there are any

***Large Containers,  
Road Vehicles, and  
Rail Cars***

Placards may be thought of as labels for large containers. Except for the placards used for infectious substances and some mixed loads, placards are large versions of the diamond-shaped hazard/class labels.

The TDG Regulations define a *large means of containment* as having a cargo capacity of more than 450 L. Unless a special case allows something else, large containers must be marked with placards if the hazardous wastes are dangerous goods that:

- require an Emergency Response Assistance Plan (ERAP)
- are liquid or gas in direct contact with a large container or
- have a total gross mass more than 500 kg

Placards must be displayed:

- before the container is loaded and
- on each of the four sides of the container

If a container has a permanent frame, the placards may be attached to the frame provided this results in their display in positions equivalent to the sides and ends of the container. In the case of a truck, this includes the front end of the truck.

Placards for subsidiary classes are not required unless the hazardous wastes require an ERAP and the subsidiary class is 4.3, or 6.1 packing group I.

A UN number must be displayed in a white space on each placard or on an orange panel next to each placard if any of the hazardous wastes are dangerous goods that:

- require an ERAP
- are liquid or gas in direct contact with a large container or
- are from one shipper, in an amount more than 4000 kg

A *DANGER* placard may be used to transport hazardous wastes having different UN numbers or classes as long as none of the wastes:

- require an ERAP
- are liquid or gas in direct contact with a large container or
- are from one shipper, in an amount more than 4000 kg

See Part 4 of the TDG Regulations for rules applicable to mixed loads of gases or large containers that are divided into compartments.

## 7.0 Training

The TDG Regulations require any person who handles, ships, or carries hazardous wastes that are dangerous goods to be trained or to work under the direct supervision of a trained person. The training must be in all topics that are part of the person's duties and must be up to date with the regulations. For ground transport, training is valid for three years.

Employers are responsible for:

- making sure that employees are properly trained
- keeping records of training and
- issuing Certificates of Training

The Certificate of Training must:

- show the name and address of the employer's place of business
- show the employee's name
- show the date the certificate expires
- show the topics the employee is trained in and
- be signed by the employee and the employer or an employee acting on behalf of the employer

Further details on training are given in Part 6 of the TDG Regulations.



# HAZARDOUS WASTE MANAGEMENT OPTIONS

Management of hazardous wastes involves much more than just treatment or disposal. There are options for dealing with wastes from source through to disposal.

Some options are more desirable than others. This ranking of options is often referred to as the hierarchy for managing hazardous wastes.

## **Avoiding Generation**

The first and most preferred option in this hierarchy is to prevent generation of the waste in the first place. This may be achieved sometimes by changing a manufacturing process, using a less hazardous raw material or using production methods that do not generate hazardous wastes. This is often the safest and most economical method of dealing with hazardous wastes.

## **Recycling**

If generation of a hazardous waste cannot be prevented, the next option in the hierarchy is to recycle the waste. Many manufacturers have found that there is profit in their waste. In some cases it is profitable to use a waste from one source in another industry. Several waste exchange programs bring together waste producers and waste users based on this idea.

Information on recycling is available from the Recycling Council of British Columbia. The Council receives partial funding from the Ministry of Environment. Various grades of membership are available for individuals and organizations. Services provided by the Council include:

- operation of the Provincial Recycling Hotline
- maintenance of a waste exchange database and online catalogue
- maintenance of the Council web site and
- publication of newsletters for members

For further information, see the Council web site or contact them at the address given in [Appendix A](#).

## **On-Site Treatment**

Unfortunately, not all wastes can be eliminated, reduced, or recycled. The next option in the hierarchy is to treat wastes where they are generated. This avoids the risk of transporting the hazardous wastes.

Simple ways of treating wastes that can often be used where the wastes are generated include:

- neutralization of acids and alkalis
- precipitation and settling to reduce waste volumes or
- some forms of oxidation

[Figure 6, Examples of Options for Management of Hazardous Wastes](#), lists options for treating some common hazardous wastes.



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**Note:** Any system that involves a discharge or emission to the environment must meet the requirements of the HW Regulation. In some cases, authorization under the *Environmental Management Act* may be required.

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**Note:** Dilution is not considered treatment under the HW Regulation.

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Figure 16, *Authorizations for Management of Hazardous Waste*, summarizes the forms of authorization required for managing hazardous waste in various ways. For more information on authorizations, see [Chapter 19](#) of this guide.

**Off-Site Treatment**

The final option for managing hazardous wastes is to transport them to an off-site facility. A wider range of specialized management processes for treatment and disposal is available at such facilities. For some wastes, an off-site facility is the only option that is safe and economical.

Later chapters in this guide describe the requirements for the various types of hazardous waste management facilities in more detail. It is only said here that options at the top of the hierarchy are preferred.

When developing the requirements in the HW Regulation for the various management options, several factors were considered. Of these, exposure of the public and risk to the environment were rated the most important. The preference given in the HW Regulation to on-site recycling facilities compared to off-site disposal facilities reflects this importance.

The amount of monitoring needed to protect the environment is also important. This in turn depends on factors such as the amount and properties of a waste, and for what time it must be managed. A small amount of slightly hazardous waste that is stored for a short time requires fewer precautions than a large amount of extremely hazardous waste that is stored permanently.



Figure 6: Examples of Options for Management of Hazardous Wastes

<i>Type of Hazardous Waste</i>	<i>Waste Management Options</i>
Acids and alkalis	<ul style="list-style-type: none"> <li>• recycling</li> <li>• neutralization</li> </ul>
Asbestos	<ul style="list-style-type: none"> <li>• solidification</li> <li>• containment during transport</li> <li>• landfill</li> </ul>
Chromium	<ul style="list-style-type: none"> <li>• recycling</li> <li>• chemical reduction to trivalent state</li> <li>• physical/chemical treatment</li> <li>• solidification and disposal in a secure landfill or building</li> </ul>
Cyanides	<ul style="list-style-type: none"> <li>• recycling</li> <li>• chemical oxidation</li> <li>• physical/chemical treatment</li> <li>• solidification and disposal in a secure landfill or building</li> <li>• high temperature incineration</li> </ul>
Fluorides	<ul style="list-style-type: none"> <li>• physical/chemical treatment</li> <li>• solidification and disposal in a secure landfill or building</li> </ul>
Heavy metals	<ul style="list-style-type: none"> <li>• recycling</li> <li>• physical/chemical treatment</li> <li>• solidification and disposal in a secure landfill or building</li> </ul>
Hydrocarbon contaminated soils	<ul style="list-style-type: none"> <li>• recycling</li> <li>• landfarming</li> </ul>
Infectious materials	<ul style="list-style-type: none"> <li>• biological treatment</li> <li>• thermal destruction</li> <li>• chemical disinfection</li> </ul>
Oils	<ul style="list-style-type: none"> <li>• recycling</li> <li>• physical/chemical treatment</li> <li>• biological treatment</li> <li>• incineration</li> </ul>
Organics (halogenated)	<ul style="list-style-type: none"> <li>• recycling</li> <li>• physical/chemical treatment</li> <li>• high temperature incineration</li> </ul>
Organics (non-halogenated)	<ul style="list-style-type: none"> <li>• recycling</li> <li>• biological treatment</li> <li>• physical/chemical treatment</li> <li>• incineration</li> </ul>
Pesticides	<ul style="list-style-type: none"> <li>• biological treatment</li> <li>• physical/chemical treatment</li> <li>• high temperature incineration</li> </ul>
Sulphides	<ul style="list-style-type: none"> <li>• physical/chemical treatment</li> <li>• chemical oxidation</li> </ul>





# ALL HAZARDOUS WASTE FACILITIES

This chapter describes the general requirements that all hazardous waste facilities must meet. These include standards for where facilities may be located as well as general safety and protective provisions.

Chapters 9 to 16 discuss the additional requirements that apply to specific types of facilities. For example, Chapter 9 discusses requirements for recycle facilities and Chapter 10 discusses requirements for storage facilities.

If a facility meets the definition of more than one type of facility, the requirements for each type of individual facility apply. For example, an off-site treatment facility must meet the requirements for:

- all facilities in this chapter
- treatment facilities in Chapter 11 and
- storage facilities in Chapter 10 if there is storage at the facility



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**Note:** To comply with the requirements of the Hazardous Waste Regulation, most hazardous waste facilities will also require some form of approval or authorization. This especially applies to facilities receiving hazardous waste. See [Figure 16, Authorizations for Management of Hazardous Waste](#), for a summary.

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## 1.0 Discussion of Definitions

Some of the more important legal definitions are discussed in this chapter. Review Part 1 of the *Environmental Management (EM) Act*, the Hazardous Waste (HW) Regulation, and the *Transportation of Dangerous Goods (TDG) Act* and Regulations for definitions that are not discussed below.

### **200-Year Floodplain**

Floodplain levels have been mapped for a number of major watercourses in BC. Maps may be downloaded from the [Water Stewardship](#) section of the Ministry of Forests, Lands and Natural Resources Operations' web site or are available from [Crown Publications Inc.](#)

The Ministry of Environment Knowledge Management Branch may be able to supply contacts for floodplains that have not been mapped. If they cannot help, a specialist consultant may be needed to determine the level of the 200-year floodplain.



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**Note:** The HW Regulation was amended to specify protection of facilities to the 200-year flood level instead of the 100-year flood level. Facilities that existed before the amendment may continue to be protected to the 100-year flood level.

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### **Approved**

This term is used frequently in the HW Regulation for situations where a site-specific or on-site review is required before the final conditions can be set.

Section 1(2) of the HW Regulation specifies that for something to be *approved* it must be:

- in writing, and
- obtained from a director unless another person's approval is specifically required

The approval may have whatever conditions or requirements the person issuing it thinks are necessary or advisable and may take the form of an order, a permit, an approval issued by a director, a Waste Management Plan, a licence, or simply a letter.

The terms *approved* and *approval*, as used in the HW Regulation, have a broader meaning than *an approval* under section 15 of the *EM Act*. An approval under section 15 of the *EM Act* is only one possible form of approval under the HW Regulation.

**Authorized Consignee** An *authorized consignee* is a receiver authorized to accept more the registration quantity of hazardous waste. To be an *authorized consignee* the receiver must:

- have a registered site number and an operational plan approved by a director or
- a written authorization from a director to accept hazardous waste

**Buffer Zone** A *buffer zone* is an area of land that separates a facility from surrounding land. Normally a buffer zone is vacant land that is not developed during the operating life of the facility. The main purpose of a buffer zone is to lessen the impact of a facility on the surrounding area. A buffer zone does not have to be owned by the facility owner, but it should be under the facility owner's control.

**Bulk Load** A *bulk load* is a shipment of hazardous waste in a container, and is made up of shipments from more than one shipper. The waste may be carried in one or more containers, but all of the waste in each container must be of the same type.

**Consignor, Carrier, and Consignee** In most cases it is not difficult to identify these parties for a shipment of waste. The *consignor* or shipper is the person who has the waste and is responsible for it before it is shipped. The *carrier* is responsible for transporting the waste to its intended destination. The *consignee* or receiver is the person the waste is sent to and who normally accepts the waste at the receiving site.

In some cases, where a broker or agent is used for a shipment, things may not be quite so clear. This is especially the case if an agent is contracted to transport and dispose of a waste. Unless there is a contract that specifies otherwise, the shipper is responsible for the waste until it is accepted by the receiving facility. A common example is where a carrier completes Part A of a manifest for a shipper. In this case, unless a contract specifies otherwise, the shipper is still responsible for making sure that the information in Part A is correct.

Ownership of a hazardous waste is only one of the factors considered in determining a person's responsibility under the HW Regulation. The person who has *control and possession* of a waste is usually the first person to be held responsible for it. Federal authorities have interpreted the consignor to be the person in charge of the facility that a waste is sent from.

**Contaminated Site** *Contaminated site* means an area of the land in which the soil or any groundwater lying beneath it, or the water or the underlying sediment, contains a prescribed substance in quantities or concentrations exceeding prescribed risk based or numerical:

- criteria
- standards, or
- conditions

The applicable criteria or standards can be found in the Contaminated Sites (CS) Regulation. Conditions, if applicable, are specified by the Ministry of Environment.

**Contamination** Contamination means the presence in soil, sediment, water or groundwater of a substance prescribed for the purposes of the definition of *contaminated site* in quantities or concentrations exceeding the risk based or numerical:

- criteria
- standards, or
- conditions

also prescribed for the purposes of the definition of *contaminated site*.

The applicable criteria or standards can be found in the CS Regulation. Conditions, if applicable, are specified by the Ministry of Environment.

**Dangerous Goods** The HW Regulation defines *dangerous goods* as substances that are *regulated* dangerous goods under the TDG Regulations, except that the exemption from regulation in section 1.25 of the TDG Regulations does not apply.

Part 1 of the TDG Regulations lists a number of special cases where substances that meet the criteria for being dangerous goods are exempted from regulation. One of these special cases is given in section 1.25 of the TDG Regulations.

Section 1.25 exempts dangerous goods handled on a single industrial site from being regulated by the TDG Regulations. The section 1.25 exemption is reasonable for transport purposes but not for regulating hazardous waste. The definition of dangerous goods in the HW Regulation therefore excludes this exemption.

Some of the other exemptions from regulation in Part 1 of the TDG Regulations are also not appropriate for waste substances. The exemptions that are not appropriate for waste substances are usually those that apply only in specific cases such as transport by road or rail. If in doubt, consult Hazardous Waste Program staff to find out if an exemption is appropriate.

Section 5.0, [Waste Classification Procedure](#), in Chapter 3 of this guide provides more details on how to check if a substance is dangerous goods under the TDG Regulations.

**Dioxin TEQ** There are a large number of chlorinated compounds having either a dioxin or furan structure. The toxicity of these compounds varies considerably. *Dioxin TEQ* (toxicity equivalent) is a number that allows the toxicity of substances containing different dioxins and furans to be compared. Dioxin TEQ is the amount of the single most toxic dioxin a substance would have to contain to have the same toxicity as the substance containing the different dioxins and furans.

Section 1 of the HW Regulation describes how to calculate dioxin TEQ. In summary, dioxin TEQ is calculated by:

- multiplying the concentration of each compound listed in Schedule 1 of the HW Regulation by its toxicity equivalency factor (TEF) and then
- adding all of the multiplied numbers together

If a measured concentration is below the detection limit of the analytical method, the concentration is assumed to be half of the detection limit.



**Note:** The dioxin TEFs listed in Schedule 1 have been updated. See [Order in Council No. 747](#) posted on the Ministry's web site for the new values effective 1 November 2017.

**Disposal** *Disposal* is any introduction of waste into the environment, by means intended to minimize the effect on the environment.

**Disposal in a Secure Building** The HW Regulation recognizes that a secure landfill is not necessarily the only possibility for permanent holding (disposal) of a waste residue. This means that a waste facility operator has some flexibility in designing a final disposal option and allows use of innovative alternatives to a conventional secure landfill for disposal of residues such as incinerator ash or solidified inorganic waste.

The concept of a disposal in a secure building grew out of the idea of an above-ground secure landfill and evolved to include any type of above-ground structure designed to keep hazardous waste from being released to the environment over a very long period of time. It is possible that such a structure could even be more secure than a traditional secure landfill since all of the waste would be readily available for inspection, recycling, or removal if necessary.

The HW Regulation does not specify the physical form of a building for secure disposal, but minimum design requirements are set. In theory such facilities could be as simple as a secure dedicated warehouse or as elaborate as a concrete mausoleum.

**Ex Situ** *Ex situ*, in relation to soil, sediment, surface water or groundwater, means that the soil, sediment, surface water or groundwater has been physically removed or excavated from where it originated.

**Facility** A *facility* can be any piece of equipment, process, or constructed works that is used to handle or deal with a hazardous waste. The most common types of facilities are listed in the definitions.

However, not every possible type of facility is defined. Even if a type of facility is not defined, the HW Regulation still applies, including the requirements of sections 3 to 14 and those in any permit, approval, or plan.

**Hazardous Waste** See Chapter 3, [When is a Waste a Hazardous Waste?](#), for a detailed discussion of hazardous wastes.

If a waste meets a definition for more than one type of waste, the definition having the strictest requirements applies. For this reason, hazardous wastes must **always** be checked to see if they are dangerous goods.

**Hydrocarbon Contaminated Soil** *Hydrocarbon contaminated soil* is a naturally occurring material such as soil or gravel that is contaminated only with a petroleum product. In this context, leaded compounds from leaded gasoline are included as petroleum products.

Special options are available for managing waste materials that meet the definition of hydrocarbon contaminated soil if the contaminant standards specified in Section 3.0 of Chapter 18 are not exceeded.

**Incinerator** An *incinerator* is a type of thermal treatment facility that uses controlled conditions to burn wastes. Facilities that use processes such as pyrolysis or plasma arc are defined as thermal treatment systems rather than incinerators. This distinction is important as there is a difference between the requirements for these types of facilities.

- Indoor** For the purposes of the HW Regulation, *indoor* means protected from the weather as in a building, but does not include shipping containers used for passive storage.
- Labpack** A *labpack* is a type of packaging used for storing or transporting smaller containers of hazardous waste. Section 2.0, *Labpacks*, in Chapter 5 of this guide details how labpacks must be constructed and packed, and how the contents must be listed and labelled.
- Land Treatment** The most common forms of *land treatment* are *land farms* or *bio farms* that use natural or enhanced biological processes to treat a waste. The facility must be designed firstly to contain the waste and secondly to maximize the desired biological activity.
- An area where waste is simply spread onto the ground without prior technical investigation or other management action is not acceptable land treatment.
- Leachable Toxic Waste** In general, leachable toxic wastes are substances that release hazardous compounds when contacted with slightly acidic water.
- In the HW Regulation *leachable toxic waste* is defined as waste that, when subject to the extraction procedure described in the US Environmental Protection Agency *Method 1311*, produces an extract with a contaminant concentration greater than those prescribed in Table 1 of Schedule 4. *Method 1311* is often called the *Toxicity Characteristic Leaching Procedure* or *TCLP*.
- 
- !** **Note:** If there is less than 0.5% by weight of solids in a liquid waste, the levels specified by the HW Regulation apply to the liquid alone.
- 
- Manage** The term *manage* is intended to include any activity that involves hazardous waste. It covers the full range of activity from the point of generation to the final disposal of any residues.
- Mobile Facility** Any facility that is designed to be transported from site to site is a *mobile facility*. Usually these are chemical or thermal treatment units mounted on trucks, trailers, or rail cars. The HW Regulation limits the number of hours of operation and the quantity of waste that may be treated at these facilities for them to be considered mobile.
- Officer** An *officer* is defined in the *EM Act* as a person designated in writing as an officer by a director, and includes a conservation officer. A peace officer is also an officer for purposes of vehicle inspection.
- On proof of identity, an officer has right of entry to any facility other than solely residential premises, for whatever investigation he or she deems appropriate.
- On Site Media** *On site media* means contaminated soil, sediment, surface water or groundwater that would be hazardous waste only because it meets any of the criteria for definition as *hazardous waste* (top box of Figure 2 on page 21) but which remains at the contaminated site where the contaminated soil, sediment, surface water or groundwater originated.
- Owner** The term *owner* includes the operator of a facility. In cases where there is a contract between an owner and an operator, the responsibilities of the owner may rest solely with the operator or with the owner depending on the terms of the contract.

**Passive Storage** *Passive storage* means storage where the only activities that take place are: putting waste into storage, removing waste from storage, or inspecting the waste in storage. Passive storage excludes any other activity such as transfer of waste between containers, or ongoing filling or packing of containers in the storage facility.

**PCB** *PCB* means any chemical compound or a mixture of compounds described as chlorobiphenyls or polychlorinated biphenyls. PCB has the general molecular formula  $C_{12}H_{10-n}Cl_n$  where  $n$  may be any number from 3 to 10.

**PCB Equipment** Any manufactured item that contains or is contaminated with a PCB liquid or PCB solid is *PCB equipment*. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers.



**Note:** An item of equipment from which PCB liquid or PCB solid has been removed is still PCB equipment until it has been decontaminated by an approved protocol. This is because the removal is a treatment process and the equipment, until decontaminated, is a *residue* from the treatment. See HW Regulation section 19(2).

**PCB Liquid** Any liquid containing more than 50 parts per million (ppm) by weight of PCB is a *PCB liquid*.

**PCB Solid** Any material or substance other than a liquid containing more than 50 ppm by weight of PCB is a *PCB solid*. Absorbents or soils contaminated with PCB are typical examples.

**PCB Wastes** PCB liquids, PCB solids, and PCB equipment are grouped together, and all except PCB equipment that is actually in service are defined as PCB wastes.



**Note:** PCB equipment becomes PCB wastes as soon as it is removed from service. This is the case even if the intent is to treat, recycle, or reuse the equipment.

**Polycyclic Aromatic Hydrocarbon TEQ or PAH TEQ**

The term *polycyclic aromatic hydrocarbon* (PAH) and the alternative *polynuclear aromatic hydrocarbon* refer to a class of compounds that is described chemically as having a structure of three or more fused benzene rings.

The toxicity of these compounds varies considerably. *PAH TEQ* (toxicity equivalent) is a number that allows the toxicity of substances containing different PAHs to be compared. PAH TEQ is the amount of benzo[a]pyrene a substance would have to contain to have the same toxicity as the substance containing the different PAHs.

Section 1 of the HW Regulation describes how to calculate PAH TEQ. In summary, PAH TEQ is calculated by:

- multiplying the concentration of each compound listed in Schedule 1.1 of the HW Regulation by its toxicity equivalency factor (TEF) and then
- adding all of the multiplied numbers together

If a measured concentration is below the detection limit of the analytical method, the concentration is assumed to be half of the detection limit.





**Note:** The PAH TEFs listed in Schedule 1.1 have been updated. See [Order in Council No. 747](#) posted on the Ministry's web site for the new values effective 1 November 2017.

<b>Principal Organic Hazardous Constituent or POHC</b>	<p><i>Principal organic hazardous constituents</i> (POHCs) are those compounds in a hazardous waste that are selected for measurement during tests to prove the capabilities of a treatment process. Although POHCs are mainly used in the testing of incinerators and other thermal treatment systems, they may also be selected and measured when other chemical or physical treatment processes are tested.</p> <p>In all cases a director decides which chemical compounds will be used in a test. In some cases surrogate or substitute compounds may be specified as alternatives if a test with the waste itself is thought to be too risky or if monitoring complexities make it necessary.</p>
<b>Product of Incomplete Combustion or PIC</b>	<p>If an incinerator does not fully burn a waste, it may emit chemical compounds in the exhaust that are harmful derivatives of the original waste. These derivatives are called <i>products of incomplete combustion</i> (PICs).</p> <p>In some cases PICs may be more harmful than the original material being burned. When a thermal treatment facility is being tested on a new waste material, it is important to identify all PICs that may be of concern.</p>
<b>Recharge Area</b>	<p>A <i>recharge area</i> is an area of land that supplies water to an aquifer. Where an aquifer is exposed or open to the surface, the recharge area is the entire area above it. If an aquifer is <i>confined</i> by an overlying layer of impervious soil or rock, the recharge area may be a great distance from the area where the groundwater is used.</p>
<b>Recycle</b>	<p>In the HW Regulation, <i>recycle</i> has a deliberately narrow definition. To be recycled, a hazardous waste or waste residue must be <i>wholly utilized</i>:</p> <ul style="list-style-type: none"> <li>• in a process where the main purpose is not waste management or</li> <li>• repackaged and offered for retail sale to meet a realistic market demand</li> </ul> <p>The definition of <i>recycle</i> excludes processes that involve application to land, burning, or where the principal purpose is waste management.</p> <p>Processes that produce a residue for disposal or that do not wholly utilize the material are actually treatment processes.</p>
<b>Secure Building</b>	<p>In the HW Regulation, a <i>secure building</i> means an above ground indoor facility meeting the requirements in sections 33, 34 and 35 of the regulation. See also <i>disposal in a secure building</i>.</p>
<b>Secure Disposal</b>	<p><i>Secure disposal</i> means disposal in a <i>secure landfill</i> or a <i>secure building</i>.</p>
<b>Secure Landfill</b>	<p>A <i>secure landfill</i> means a landfill meeting the requirements in sections 25, 26 and 27 of the HW Regulation and for which a permit has been issued as required by section 24.1 of the regulation.</p>
<b>Storage</b>	<p><i>Storage</i> means the storage of hazardous waste with the intention to move the waste for treatment or disposal. (See also <a href="#">passive storage</a>.)</p>

The HW Regulation does not specify a maximum time that a waste may be held in a storage facility. However, the owner of a storage facility must make provision for final disposal of all waste in storage to avoid having to meet the requirements for disposal in a secure building.

If the amount of waste stored at any time exceeds the registration quantity for the type of waste involved, the waste storage must be registered. Registration quantities are given in [Figure 5, Registration Quantities](#), in Chapter 4.

Facilities that are part of a treatment process where waste is held during treatment for process reasons or to even out flow variations are not considered to be storage facilities.

### **Thermal Treatment**

Thermal treatment is the treatment of hazardous waste in a device using elevated temperatures.

### **Treatment**

*Treatment* is the use of a process or operation to change physical, chemical, or biological properties of a waste. The usual reason for treatment is to make hazardous waste less hazardous or to reduce its volume.

Under the HW Regulation, activities, such as reclaiming of solvents or used oil, are treatment, not recycling. Dilution is never a form of treatment under the HW Regulation.

### **Waste Asbestos**

Any waste containing 1% or more of friable asbestos fibres or asbestos dust is a hazardous waste. *Friable* means easily crumbled and is a key word. Any asbestos that is tightly bound in a solid such as cement or hardboard is not hazardous waste.

US Environmental Protection Agency *Method 600-R-93-116* or US National Institute for Occupational Safety and Health *Method 9002* are approved in the HW Regulation for testing the percent of friable asbestos.

### **Wastes Containing Dioxin**

Wastes containing chlorinated dioxins and furans at levels higher than 100 parts per billion expressed as *dioxin TEQ* are defined as *wastes containing dioxins*. This definition captures wastes containing dioxins and furans that are not captured as toxic substances in class 6.1 of the TDG Regulations.

### **Waste Containing Polycyclic Aromatic Hydrocarbon**

Wastes containing polycyclic aromatic hydrocarbon at levels higher than 100 parts per million expressed as *PAH TEQ* are defined as wastes containing polycyclic aromatic hydrocarbon. This definition captures wastes containing PAH which are not captured as toxic substances in class 6.1 of the TDG Regulations.

### **Waste Containing Tetrachloroethylene**

Wastes containing more than 500 parts per million of tetrachloroethylene are defined as *wastes containing tetrachloroethylene*. This definition captures wastes containing tetrachloroethylene that are not captured as toxic substances in class 6.1 of the TDG Regulations.

### **Waste Oil**

*Waste oil* is defined as waste that contains more than 3% by weight of refined mineral oil where the oil has become unsuitable for its original purpose owing to impurities or loss of original properties.

In some cases, waste oil may be dangerous goods in class 3 because it is flammable, or dangerous goods in class 9 because it contains environmentally hazardous substances.

The definition does not include crude oil, any oil generated at a well site, substances classified as dangerous goods for any reason other than those listed above, or substances that also contain dioxins or furans in quantities greater than 100 parts per billion expressed as dioxin TEQ.

Some waste oil may qualify as hydrocarbon contaminated soil. Such waste oil may be eligible for the less restrictive management options for this type of waste.

**Waste Pile** A *waste pile* is a facility where solid hazardous waste is stored or treated. This definition does not include wastes in containers and therefore normally applies to bulk storage of wastes. The waste may be stored outdoors if the weather does not have a detrimental effect on it.

## 2.0 General Provisions and Exemptions

Except as discussed in this section, the HW Regulation applies to all hazardous waste facilities. General requirements and exemptions from the HW Regulation are briefly discussed below. In each case references to the applicable section of the HW Regulation are given.

### 2.1 Quantity

**HWR Section 2(5)** The HW Regulation does not apply to amounts of hazardous waste less than 5 L or 5 kg unless the waste contains PCB. When waste is generated, these amounts apply to the amount generated in 30 days. When waste is stored, these amounts apply to the total amount in storage at any time.

**HWR Section 17.1(1)** When PCB wastes are stored, the full requirements of the HW Regulation apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any liquid containing more than 50 ppm of PCB or
- 100 kg or more of any material other than a liquid, contaminated with more than 50 ppm of PCB

These amounts are the total of all amounts at a single location owned or controlled by the same person. They include PCB equipment.



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**Note:** The federal PCB Regulations also apply to stored PCBs and have strict maximum allowable storage periods.

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**HWR Section 46(1)** A manifest must be used to transport:

- 5 kg or more of PCB solids
- 5 L or more of PCB liquids or
- an amount of a PCB solid or PCB liquid containing more than 500 g of PCB

### 2.2 On-Site Facilities Existing on 1 April 1988

**HWR Section 2(3)** An on-site facility is one where hazardous waste is managed on the same property where it was produced. The siting standards in the HW Regulation do not apply to any on-site hazardous waste facility existing on 1 April 1988 until the Minister of Environment orders otherwise.

### 2.3 Common Facility Definitions

**HWR Section 2(1)** Some types of hazardous waste facilities meet the definition of more than one type of facility. Such facilities must comply with all of the requirements for each type of facility for which they fit the definition.

For example, a mobile unit for treating PCB chemically must meet the requirements for mobile facilities and for treatment facilities, and the general requirements for all facilities found in sections 3 to 14 of the HW Regulation.

### 2.4 On-Site Volume Reduction

**HWR Section 2(6)** An on-site treatment facility used only to reduce the volume of a hazardous waste is exempt from the siting, operational, and performance requirements of the HW Regulation for a treatment facility.

This exemption is intended to encourage waste generators to minimize the volume of waste sent off site for treatment by using operations such as bailing or compacting. To qualify for exemption, volume reduction operations must not significantly change the total mass of the waste or its hazard characteristics.

Because the conditions for this exemption are so restrictive, it is recommended that any proposal to use this exemption be reviewed by Ministry staff. For example, compaction of oil filters does not qualify if it results in separation of oil from the filter carcasses.

### 2.5 On-Site and Off-Site Recycling

**HWR Section 2(7)** An on-site recycle facility is exempt from the siting, operational, and performance requirements of the HW Regulation if the hazardous waste being recycled is normally contained in the raw materials used in or produced by an industrial process on the site.

For example, a lead smelter qualifies for the exemptions if scrap plates from waste batteries generated by the smelter are recycled by mixing them with the ore concentrate. By contrast, a forest company cannot claim the on-site recycle exemption for disposal of wood waste contaminated with pesticide in a pulp mill power boiler. In the first case, lead is both a component of the feed and a product of the smelter. In the second case, pesticides are neither a normal raw material for a boiler, nor products of a pulp mill.

An off-site recycle facility qualifies for the same exemptions as an on-site facility, as long as the amount of hazardous waste being processed there is less than 5% of all incoming raw materials.



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**Note:** The 5% applies to *all* incoming raw materials, not just the materials of the same type as the hazardous waste.

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In the example above, the lead smelter still qualifies for exemption from the *HW Regulation* if it keeps the amount of waste coming from off-site sources below 5% of all input materials. These exemptions are intended to encourage recycling.

## 2.6 Mining Wastes

**HWR Section 2(8)** As long as no other hazardous wastes are involved, many sections of the HW Regulation do not apply to waste rock or tailings from a mine even if the rock or tailings are hazardous waste. However, care must be taken to make sure that those requirements that do apply, such as a closure plan, are not overlooked. If a company proposes to dispose of any other hazardous waste in their tailings pond, a specific approval such as a permit or other form of authorization is required.

In cases where waste rock and tailings are known to be hazardous wastes, the Ministry will determine appropriate measures for environmental protection as part of the permit evaluation process.

## 2.7 Substitutions

**HWR Section 2(9)** Except for cases exclusively reserved for the Minister, a director has broad authority in individual cases to substitute a different requirement for any requirement in the HW Regulation. Substitutions may be made if a director feels they are needed to protect the public or the environment or if the intent of the HW Regulation is met. A substitution may include withdrawal of an exemption granted somewhere else in the HW Regulation.

## 2.8 Management of Specific Hazardous Wastes

**HWR Sections 39.1 to 42.4** Sections 39.1 to 42.4 of the HW Regulation allow some other options for managing some specific hazardous wastes. Unless a director orders otherwise, Parts 2, 3, and 4 of the HW Regulation do not apply to facilities that manage these hazardous wastes according to the options specified.

The sections in which other options are set for specific types of wastes are:

- section 40: waste asbestos
- section 41: waste oil
- section 41.1: hydrocarbon contaminated soil
- section 42: pest control product wastes and containers
- section 42.1: waste paint and
- sections 42.2 to 42.4: household hazardous waste

### 3.0 Siting Standards

The HW Regulation siting requirements discussed in this chapter apply to most facilities, whether a facility is used for storage, treatment, or any other management option. Listed below are exceptions and what they relate to:

- section 2(2): off-site facilities existing before 1 April 1988
- section 2(3): on-site facilities existing before 1 April 1988
- section 2(6): on-site volume reduction facilities
- section 2(7): recycle facilities
- section 2(8): facilities for managing mine tailings or waste rock
- section 2(9): substituted requirements
- section 22: mobile facilities
- section 39.1: management of specific hazardous wastes
- section 40: management of waste asbestos
- section 41: management of waste oil
- section 41.1: management of hydrocarbon contaminated soil
- section 42: management of waste pest control products and containers
- section 42.1: recycling of waste paint
- section 42.3: return collection facilities for household hazardous waste
- section 48: storage of small quantities of hazardous waste
- section 51: changes to regulatory requirements based on an application and
- section 52: response to spilled or abandoned dangerous goods

#### 3.1 200-Year Floodplain

##### **HWR Section 3**

This requirement is intended to prohibit the operation of a facility in an area where it may be affected by a major flood, unless the facility is protected to prevent escape of the waste.

Floodplain maps may be downloaded from the [Water Stewardship](#) section of the Ministry of Forests, Lands and Natural Resources Operations' web site or are available for a fee from [Crown Publications Inc.](#)

If any difficulty is encountered in determining the 200-year flood level at a particular site, the Knowledge Management Branch of the Ministry of Environment may be able to help.

The owner of any operation built within a 200-year floodplain must show to the satisfaction of a director that the facility is *designed, constructed, operated, and maintained to prevent washout*.

To be consistent with existing floodplain maps, the HW Regulation was amended to specify protection of facilities to the 200-year flood level instead of the 100-year flood level. Facilities existing at the time of the amendment may continue to be protected to the 100-year flood level.

### 3.2 *Holocene Faults*

**HWR Section 3** Holocene faults are geological faults that have been active during the last 11 000 years. It is realized that geological faults are not always obvious or known, especially in areas where there has been little geological exploration. Information on faults may be available from the offices of the [Geological Survey of Canada](#).

### 3.3 *Tsunamis*

**HWR Section 3** Tsunamis or tidal waves are usually the result of earthquakes at sea and therefore only affect coastal waters. Low tidal areas and land close to long narrow fiords are especially prone to tsunamis. Facilities operating in such locations require protection by dikes or similar works to prevent washout.

### 3.4 *Slope Failure*

**HWR Section 3** Areas close to steep or unstable slopes are poor locations for a hazardous waste facility. A facility must be at least 100 m from any unstable slopes. A qualified geotechnical expert must be consulted if there are any questions about slope stability.

### 3.5 *Protected Wildlife Areas*

**HWR Section 3** Hazardous waste facilities may not be located in protected wildlife areas such as designated parks, wildlife preserves, or sanctuaries. Contact the nearest office of the Regional Operations Branch or the Parks and Protected Areas Branch in Victoria to identify boundaries of such areas.

## 4.0 Operational Requirements

With exceptions similar to those listed above in Section 3.0, [Siting Standards](#), the requirements discussed in this chapter apply to all facilities regardless of size or type.

### 4.1 *Plans*

**HWR Section 4** In general, plans for constructing or modifying a facility must be approved by a director before starting any work. Plans are required for both physical works and for operating the facility.

The intent is to make sure that the proposed works or modifications are able to manage the hazardous waste safely. When approval is given, the facility must be constructed, installed, and operated according to the approved plans and any requirements or conditions a director may set for the approval.

The plans for physical works must include details of the spill containment system. More details on the content of plans for physical works are available in the [Plans and Specifications Guideline](#) available from the Hazardous Waste section of the Ministry's web site.

The operational plans must include:

- types and maximum amounts of wastes that will be stored, treated, recycled, or disposed of at the facility and
- details of proposed monitoring, reporting, and auditing

More details on the content of operational plans are available in the [Operational Plan Guideline](#) available from the Ministry's website.

**HWR Section 16(2)** Where the owner's primary business is not waste management and unless requested by a director, the requirements for plans outlined above, are reduced for on-site passive storage facilities as follows:

- approval of plans and specifications for physical works as well as the contingency and closure plans discussed below is not required and must be not requested, and
- operational plans are not required, and approval of any such plans must not be requested

#### **4.2 Waste Information**

**HWR Section 5** Any facility managing hazardous waste must have complete information on the hazards and properties of the waste.

The amount of waste received must be measured whenever a manifest indicates that a shipment is more than 100 kg or 100 L. The Environmental Protection manager in the local office of the Regional Operations Branch must be contacted before accepting a shipment if:

- the amount received is more than 5% different from what is shown on the manifest
- the waste does not match the description on the manifest or
- there is no manifest with a shipment

#### **4.3 Waste Record**

**HWR Section 6** Records of hazardous waste received or stored at a facility must be kept on hand for inspection by an officer. When waste is shipped from a facility, all records relating to that waste must be kept for at least two years. These records must show clearly the amounts and location of wastes on hand at the facility, and how wastes that are no longer at the facility were disposed of.

The record-keeping system may be in the form of paper or computer files.

#### **4.4 Weather Protection**

**HWR Section 7** The level of weather protection at any facility must be suitable for the type of waste and the severity of the weather at the site. This means that buildings, covers, heaters, and the like are required for most hazardous waste facilities. Weather protection may not be needed for facilities such as lagoons or land farms if the waste is not affected by the weather or if the management facility itself provides adequate protection.

#### **4.5 Access Security**

**HWR Section 8** Hazardous waste facilities must be designed to prevent unauthorized access to the facility by people and animals. The degree of protection required depends on the types of waste and the opportunities for access. The HW Regulation specifies that there must be:



- a 24-hour surveillance system or a barrier with controlled means of access
- protection for all valves, electrical controls, and similar devices that would be accessible if an intruder was able to get through the surveillance system or barrier and
- signs warning of restricted access

Where a hazardous waste facility is located within the controlled access area of an industrial operation such as a refinery, separate access control to the facility is not required as long as the level of control to the whole property is consistent with the requirements of the HW Regulation. In such cases, a property owner may need to designate who is authorized to access the hazardous waste facility.

#### **4.6 Fire Protection**

**HWR Section 9** The HW Regulation specifies minimum requirements for a facility managing any ignitable or reactive hazardous waste. These include:

- protection of stored waste from sources of ignition by using separation distances or two-hour rated fire barriers, electrical grounding, and suitable warning signs
- provision of a 24-hour fire alarm system with heat and smoke sensors, capable of shutting down any forced air ventilation systems and summoning 24-hour external emergency response
- provision of a fire suppression system or equipment
- use of good housekeeping practices, non-combustible building construction, and indirect facility heating and
- avoidance of reactions likely to cause explosions or other undesirable emissions

The provincial *Fire Services Act* or municipal bylaws may have further requirements. The facility owner must make sure that any such requirements are also met.

Some requirements are specified in general terms because they depend on conditions that are specific to the site. In these cases, good engineering practice must be used to decide the required level of protection. For example, electrical grounding is not required where flammable waste is stored in closed drums. As another example, the separation distance or barrier between flammables and a source of ignition depends in part on the type of potential ignition source.

#### **4.7 Spill Protection**

**HWR Section 10** Facility owners must provide and maintain spill containment systems for any hazardous waste. These systems must be approved by a director. The level of protection must be suitable for the hazard posed by the waste, but at minimum should contain the waste on site.

The requirement for spill protection does not apply only to liquid wastes. Facilities that manage fine powders, dusts, and gases also require spill containment systems.

Spill protection systems must be checked at least monthly for any leaks or problems that could allow waste to escape or cause a health hazard. If any free liquid waste is stored at a facility, weekly inspections or a 24-hour spill alarm are required.

Records of system inspections must be kept. If any irregularities are found, these must be reported immediately to a director together with details of the actions taken to correct the problem.



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**Note:** A problem that results in a release of waste to the environment may need to be reported to the Provincial Emergency Program as specified in the Spill Reporting Regulation. See [Chapter 22](#) of this guide for further details.

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#### **4.8 Contingency Plan**

##### **HWR Section 11**

A contingency plan is a document that provides all relevant information to make an initial sustained response to any type of spill or emergency at a facility. The plan must contain:

- the names of the designated Emergency Response Coordinator and his or her alternate
- detailed procedures for facility evacuation and shutdown
- procedures for notification of emergency response teams and affected parties
- measures to lessen the impact of a problem, such as identification of choke points to contain runoff of fire water
- inventories of emergency equipment both on and off site
- identification of independent contractors with emergency response capabilities, such as backhoe operators and
- how communication will be maintained

In general, the plan must be approved by a director, kept up to date and tested regularly.

##### **HWR Section 16(2)**

Where the owner's primary business is not waste management and unless requested by a director, approval of the contingency plan is not required and must not be requested.

#### **4.9 Emergency System Testing**

##### **HWR Section 12**

A facility must have its various emergency systems tested or inspected at least once per year to make sure that all protective measures are working properly. Records of each test must be kept, and if the facility manages more than 20 tonnes of waste per year, the record of tests must be sent to a director within 90 days of the test.

The intent of this requirement is to check that all equipment, plans, and procedures designed to handle an emergency are able to provide an adequate level of protection. Any problems identified during a test or inspection must be corrected as soon as possible.

#### **4.10 Personnel Training**

##### **HWR Section 13**

Every person who works at a hazardous waste facility in an operational capacity must receive formal training. The training must be given before the person starts work and must include:

- basic duties and responsibilities of the position
- proper use of protective clothing
- procedures for responding to fires, explosions, or spills
- operation of communications and alarm systems

- lessening of the impact of spills and spill clean-up equipment
- shutdown procedures and
- hazards of the wastes managed at the facility

The depth of training must be suitable for the hazards of the wastes managed at the facility.

To make sure that any new procedures, equipment, or responsibilities are not overlooked, all operational employees must receive an annual review of their initial training.

Records must be kept of the training given to employees operating a facility and must include for each:

- their duties and responsibilities
- the level of training received and
- the date of the last training session

#### 4.11 Closure

**HWR Section 14** Before start-up, every hazardous waste facility must have an approved closure plan. The plan must describe:

- how and when a facility will be closed
- the decontamination procedures that will be used
- how long it is expected that it will take to close the facility and
- what types and amounts of waste residues could be left after closure

The last point is important information for anyone interested in future development of the site.

Amendments to a closure plan must be sent to a director if there are any changes in a facility's design, operation, or intended closure date.

A facility owner must notify a director at least 90 days before starting to close a facility. The facility must then be closed according to the approved closure plan.

**HWR Section 16(2)** Where the owner's primary business is not waste management and unless requested by a director, approval of the closure plan or any amendments to the closure plan is not required and must not be requested.



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**Penalties:** Anyone not complying with the HW Regulation may be:

- fined up to \$1 000 000 and/or
- imprisoned for up to six months

Each day an offence continues may result in another fine up to the maximum.

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# RECYCLE FACILITIES

In the Hazardous Waste (HW) Regulation, the term *recycle* has a very narrow definition. To meet the definition, a hazardous waste or waste residue must be wholly utilized:

- in a process where the main purpose is not waste management or
- repackaged and offered for retail sale to meet a realistic market demand

Processes that involve application to land, burning, or where the main purpose is waste management are excluded from being recycling.

In the definition, the words *wholly utilized* are key: there must be no residue left over after a waste has been processed. Processes that produce a residue for disposal or that do not completely use a waste are actually treatment. The narrow definition of recycle means that *recycle facilities* are also narrowly defined.

Examples of recycle facilities are:

- a smelter that recovers metals from plating wastes and that uses all of the waste in the process or
- a pulp mill that uses waste lime slurry from production of acetylene and that uses all of the sludge in the process

Examples of facilities or operations that are not recycle facilities are:

- a facility that distils solvent for future sale from a paint waste: this is not recycling because a residue is produced from the distillation
- a cement plant using waste oil for firing a kiln: this is not recycling because the definition of recycle excludes burning or
- a farm where waste organic phosphate is spread on agricultural land: this is not recycling because the definition of recycle excludes application to land

The operations above are treatment or disposal rather than recycling.

## **Exemptions**

To qualify for the exemptions for recycle facilities in section 2(7) of the HW Regulation, the materials in the waste or waste residue must normally be part of the raw materials for the recycle facility. In addition, for an off-site facility the waste or waste residue may not be more than 5% of all raw materials.

In the pulp mill example above, logs, water, and other materials used in the process may be used for calculating this percentage.

## 1.0 Operational Requirements

### **HWR Section 15**

Recycle facilities have simple operational requirements. There must be an automatic means of stopping the process if there is an upset and the materials used in the process must be compatible with the hazardous waste. If liquid wastes are being transferred, dripless hose connections must be used.

### **Dripless Hose Connections or Containment**

A dripless hose connection is any type of connection that prevents spillage or release of drips to the environment. It is not a specific mechanical device. A containment system that provides equal or better protection is also acceptable.

Examples are:

- couplings with internal valves, similar to some safety air hose couplings
- use of purging before breaking a line or
- catch-pans



# STORAGE FACILITIES

*Storage* means keeping hazardous waste in a safe place before recycling, treatment, disposal, or management in some other way. The Hazardous Waste (HW) Regulation does not specify a maximum time that a waste may be held in a storage facility. However, the owner of a storage facility must make provision for final disposal of all waste in storage to avoid having to meet the requirements of disposal in a secure building.

If the amount of waste stored at any time exceeds the registration quantity for the type of waste involved, the waste storage must be registered. Registration quantities are given in [Figure 5, Registration Quantities](#), in Chapter 4.

Facilities that are part of a treatment process where waste is held during treatment for process reasons or to even out flow variations are not considered to be storage facilities.

The definition of a storage facility does not specify the use of a building, although this is often necessary to meet the requirements of the HW Regulation.

Since most PCB wastes are managed in storage facilities, the special requirements for these materials are discussed in this chapter of the guide.

## 1.0 Operational Requirements

**HWR Section 16** Other than for PCB wastes, storage facilities have simple operational requirements. For facilities that store free liquid hazardous waste, the requirements are to:

- have space for visual manual leak inspection
- have containment
- provide forced ventilation for indoor facilities unless the facilities are used only for passive storage
- provide overflow protection for tanks
- use dripless connections if detachable hoses or pipes are used
- make sure all equipment is compatible with the waste and
- make sure all transfer lines have protection to prevent release of waste

**Leak Inspection** The requirement for manual visual inspection usually rules out underground tanks. However, a tank inside a vault that allows the operator to check the tank and any associated piping for leaks would be acceptable.

**Containment** Containment must be impervious with sufficient capacity to hold the larger of:

- 110% of the largest volume of free liquid in any container or
- 25% of the total volume of free liquid in storage

*Impervious* is defined as having a permeability not greater than  $1 \times 10^{-7}$  cm/s when tested using a head of 0.305 m of water.

**Ventilation** The minimum ventilation rate for indoor facilities, other than those used for passive storage, is  $0.3 \text{ m}^3/\text{min}/\text{m}^2$  of air exhausted at all times.

- Overflow Protection** Overflow protection must be provided in one of three ways:
- fixed piping to an adjacent empty tank having a capacity not less than 20% of the capacity of the protected tank
  - a level alarm set to alarm when the tank is 90% full or
  - an automatic shutoff set to shut off waste flow into the tank when the tank is 95% full

**Dripless Hose Connections or Containment** A dripless hose connection is any type of connection that prevents spillage or release of drips to the environment. It is not a specific mechanical device. A containment system that provides equal or better protection is also acceptable.

Examples are:

- couplings with internal valves, similar to some safety air hose couplings
- use of purging before breaking a line or
- catch-pans

**Protection for Transfer Lines** Unless containment is provided to prevent release of hazardous waste, all transfer lines must be provided with automatic shutoff valves or similar devices to stop the flow of any hazardous waste in the event of an emergency.

Containment in this context includes measures such as double piping as well as conventional dikes.

## 2.0 Performance Standards

**HWR Section 17** The performance standards for storage are that:

- emissions to the air must meet approved levels
- effluent from the facility must meet applicable discharge standards and
- some form of financial security may be required

**Air Emissions** Air emissions for storage facilities are set on a case-by-case basis. They must be approved in writing by a director.

**Effluent Discharges** Any effluent discharged from a storage facility must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in [Figure 7, Effluent Standards for Hazardous Waste Facilities](#).

The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.



**Note:** Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.

**Financial Security** A director may require the owner of a storage facility to give security as a performance guarantee. The form, amount, and conditions of the security are set by a director.



### 3.0 Additional Requirements for PCB Wastes

**HWR Section 17.1** The amounts of PCB wastes regulated by the HW Regulation are smaller than those for other types of wastes. If PCB wastes are stored, the full requirements of the HW Regulation apply to:

- 1.0 kg or more of pure PCB
- 100 L or more of any *PCB liquid* or
- 100 kg or more of *PCB solid*

These amounts are the total of all amounts at a single location that is owned or controlled by the same person, and include PCB equipment.

*PCB liquid* means any liquid containing more than 50 parts per million by weight (ppm) of PCB.

*PCB solid* means any material or substance other than a PCB liquid that contains or is contaminated with more than 50 ppm of PCB.



**Note:** The federal PCB Regulations also apply to stored PCBs and have strict maximum allowable storage periods which would prohibit provisions in the HW Regulation related to storage prior to 1 April 1992.

In event of a conflict between the HW Regulation and the PCB Regulations, follow the PCB Regulations.

#### 3.1 Packaging

##### **Drums for PCB Liquids**

If PCB liquids are stored in drums of capacity up to 205 L, the HW Regulation specifies that the drums must:

- be painted to prevent rusting
- be of 16 gauge or heavier steel if packed or stored after 1 April 1992
- be closed-top with two screw bungs and
- not be stacked more than two high

To minimize the risks associated with repacking PCB liquids, the HW Regulation allows lighter gauge steel drums for wastes placed in storage before 1 April 1992.

##### **Drums for PCB Solids**

If PCB solids are stored in drums of capacity up to 205 L, the HW Regulation specifies that the drums must:

- be painted to prevent rusting
- be of 18 gauge or heavier steel
- have a securely attached, close-fitting, removable steel lid and PCB-resistant gasket and
- not be stacked more than two high

##### **Other Containers**

Containers other than drums are acceptable. These may be stacked two high if they are specifically designed to be stacked.



**Note:** Containers used to transport materials containing more than 50 ppm of PCB must also meet the requirements of the Transportation of Dangerous Goods (TDG) Regulations. For drums, this means that they must be UN certified. See Part 5 of the TDG Regulations for details.

**Storage System** All containers or equipment containing PCB must be on pallets, skids, or other type of storage system that allows for easy leak inspection and removal of the waste.

### 3.2 Inventory and Fire Safety Plan

A current inventory and site map showing where PCB wastes are stored at a facility and a fire protection plan acceptable to the local assistant to the fire commissioner must be kept on site. Copies of these must be provided to:

- a director and
- the local assistant to the fire commissioner

### 3.3 Labelling

Under the HW Regulation, stored containers or equipment containing PCB must have Environment Canada labels or reasonable alternatives as follows:

- capacitors containing more than 0.5 kg of PCBs, except those stored in containers before 28 February 1989: serialized, black-and-white *CAUTION/ ATTENTION PCB* label measuring 76 mm by 76 mm
- equipment containing PCBs in a concentration greater than 1% by weight: serialized, black-and-white *ATTENTION PCB* label measuring 150 mm by 150 mm
- equipment containing PCBs in a concentration greater than 50 ppm, but not greater than 1% by weight: *ATTENTION contaminated with PCBs* label
- containers containing PCBs in a concentration greater than 1% by weight: *ATTENTION PCB Waste* label and
- doors to storage sites, fencing, and other security barriers enclosing storage sites: black-and-white *ATTENTION PCB* label measuring 150 mm by 150 mm



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**Note:** See also the federal PCB Regulations, which specify requirements for labelling in sections 29 to 32. The most important of these additional to the HW Regulation requirements is that the labels must show the date on which storage of containers or equipment began at storage sites that are not transfer or destruction facilities.

In event of a conflict between the HW Regulation and the PCB Regulations, follow the PCB Regulations.

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### 3.4 Storage Area

**Containment** Areas where undrained PCB equipment or PCB liquids are stored must have:

- spill containment or
- existing drains or other openings in the floor sealed to prevent escape of liquid

For a single item stored alone, the capacity of the containment must be 125% of the volume of PCB liquid in the item.

For more than one item stored together, the capacity of the containment must be the larger of:

- twice the volume of PCB liquid in the largest item or
- 25% of the volume of PCB liquid stored together

**Materials**

The floors or other surfaces on which undrained PCB equipment or PCB liquids are stored must be constructed of durable materials such as steel or concrete. Any floors or containment surfaces that are porous must be sealed.



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**Tip:** The fire protection for the storage area does not have to meet the requirements specified in section 9 of the HW Regulation if the PCB liquids are not ignitable and no ignitable liquids are stored with the PCB wastes.



**Tip:** Drums may be considered the required spill containment for capacitors or other items that are not leaking, if the containment capacity requirements are met.

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# TREATMENT FACILITIES

A *treatment facility* is a place where the physical or chemical properties of a hazardous waste are changed to reduce or eliminate one or more of its hazards. Treatment facilities may be located either at the point of generation or off site.

The requirements apply equally to both cases, with one significant exception: on-site treatment facilities are exempt from the siting, operational, and performance requirements of the Hazardous Waste (HW) Regulation if they are used only to reduce the volume of a hazardous waste. This is an incentive to industry to minimize the volume of wastes that would otherwise be sent to a central treatment facility.



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**Note:** Dilution is not considered treatment under the HW Regulation.

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The following sections briefly discuss the operational requirements and the performance standards for treatment facilities.

## 1.0 Operational Requirements

**HWR Section 18** For treatment facilities the main operational requirements are to:

- have an automatic means to shut down the process equipment and waste feed systems in the event of a problem and
- conduct an approved demonstration trial showing the effectiveness of each process treating hazardous waste before beginning operation at the facility

The intent of the operational requirements is to make sure that hazardous wastes processed at the facility do not endanger the environment or human health. Additional requirements may need to be included in the operational plan for a treatment facility before it is approved by a director.

**Demonstration Trial** Conducting a demonstration trial is a three-step process which consists of:

- providing all relevant information to a director for approval
- conducting the trial and
- reporting the trial results to a director

Relevant information includes details of:

- the waste to be treated
- the treatment process, including emissions or residues produced by the treatment, operating conditions, and discussion of any conditions likely to cause bad effects and
- the proposed method for conducting the demonstration trial, often called the *trial protocol*

To be an adequate test, the trial protocol must cover all worst-case conditions that could be occur. This may require more than one test.

The demonstration trial must be carried out according to the approved trial protocol. In some cases a representative of a director or other independent party may have to witness all or part of the trial.

If a director thinks that a trial could be dangerous, the facility operator may have to first conduct a trial using non-hazardous materials. After there is enough evidence to show that the process is safe with non-hazardous materials, the trial may proceed with hazardous wastes.

The results of the demonstration trial must be reported to a director for approval. Approval must be received before the facility starts operating.

## 2.0 Performance Standards

**HWR Section 19** The performance standards for treatment facilities are that:

- emissions to the air must meet approved levels
- effluent from the facility must meet applicable discharge standards and
- residues from the facility are managed at a hazardous waste management facility unless they are *delisted*

**Air Emissions** Air emissions for treatment facilities are set on a case-by-case basis. They must be approved in writing by a director.

**Effluent Discharges** Any effluent discharged from a treatment facility must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in [Figure 7, Effluent Standards for Hazardous Waste Facilities](#).

The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.




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**Note:** Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.

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Any effluent with contaminants exceeding the applicable standards must be further treated until it does meet the standards before being discharged.

Because Schedule 1.2 does not include every possible contaminant, a director may set additional standards for specific cases.

**Management of Residues** Solid residues from a treatment facility must be managed at a hazardous waste facility unless they are shown to the satisfaction of a director, to be non-hazardous and suitable for authorized disposal to landfill or some other approved management option.

On-site recycling, treatment at the same facility, or some other form of management, such as disposal in an off-site secure landfill or secure building, is acceptable. In some cases, residues may be delisted.

**Delisting of Residues** *Delisting* a residue means proving that the residue does not need to be regulated as a hazardous waste because it is not a hazard to human health or the environment. As such, deregulating a residue may be a better way of describing this process.

The process for deregulating a residue is specified in section 53 of the HW Regulation. Anyone wanting to deregulate a hazardous waste residue should contact a director. They will be advised if there is a protocol approved by a director for the type of residue concerned.



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**Note:** The deregulating process is stricter than the process for classifying hazardous waste. That is, a residue that does not exceed any criteria for classification as hazardous waste must still be managed as hazardous waste unless specifically deregulated. The operator of a treatment facility should therefore discuss residue deregulating requirements well before disposal becomes necessary.

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Deregulated residues may be disposed of in an authorized landfill other than a secure landfill or managed in some other manner according to an approved management option.

**Figure 7: Effluent Standards for Hazardous Waste Facilities**

From HW Regulation Schedule 1.2

<i>Parameter</i>	<i>Discharges to the Environment or Storm Sewers</i>	<i>Discharges to Municipal or Industrial Effluent Treatment Works†</i>
Physical		
pH	6.5 to 8.5	5.0 to 11.0
Temperature	32 °C	-
Total suspended solids	20 mg/L	-
Toxicity (96-h LC <sub>50</sub> , rainbow trout)	100% effluent	50% effluent
Inorganics (mg/L)		
Aluminum, dissolved	0.5	2.0
Ammonia, total (expressed as nitrogen)	2.0	-
Antimony, dissolved	0.25	0.5
Arsenic, dissolved	0.1	0.3
Barium, dissolved	1.0	2.5
Boron, dissolved	10.0	15.0
Cadmium, dissolved	0.05	0.1
Chromium, dissolved (hexavalent)	0.1	0.2
Chromium, total	0.5	1.0
Cobalt, dissolved	0.1	0.3
Copper, dissolved	0.1	0.3
Cyanide (weak acid dissociable)	0.1	0.2
Fluoride, dissolved	15.0	18.0
Lead, dissolved	0.1	0.3
Manganese, dissolved	0.5	1.0
Mercury, total	0.001	0.01
Molybdenum, dissolved	0.5	1.0
Nickel, dissolved	0.5	1.0
Selenium, dissolved	0.05	0.1
Tin, dissolved	0.5	1.0
Zinc, dissolved	0.2	0.5
Organics (mg/L)		
Biochemical oxygen demand (BOD <sub>5</sub> )	20	-
Dioxin TEQ	0.000 000 000 015	0.000 000 000 015
Oil	10	60
Phenol	0.2	0.5
Polychlorinated biphenyls, total	0.005	0.005
Total chlorinated phenol	0.006	0.05
Total organic halogens (as chlorine)	1.0	1.0

† Local municipal requirements may be more restrictive.





# INCINERATORS AND OTHER THERMAL FACILITIES

A *thermal facility* is a treatment facility where elevated temperatures are used to reduce or eliminate the hazards of a hazardous waste. Treatment units that burn wastes in air or oxygen using a controlled flame are defined as *incinerators*.

Common examples of incinerators are rotary kilns and furnaces. These units are designed to mix air or oxygen and a fuel in a controlled manner so that heat output from the burning is maximized.

Systems using technologies such as plasma arc, infrared, or inductive heating are examples of thermal facilities that are not incinerators. In these processes heat is usually generated without using a fuel. In each of these cases, intense heat causes a molecular breakdown of the waste.

This chapter describes the requirements for incinerators and other thermal facilities. As is the case with treatment facilities, there are no special siting requirements for thermal facilities. If such requirements are needed, they may have to be included in the operational plan before it is approved by a director.



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**Tip:** Under section 39.1 of the Hazardous Waste (HW) Regulation, facilities burning waste oil not exceeding the specifications given in [Figure 12, Waste Oil Specifications for Use as Fuel](#), in Chapter 18 are exempt from the requirements of this section.



**Tip:** Industrial utility boilers used for destruction of wastes containing low levels of PCBs or pentachlorophenol and satisfying the performance requirements discussed in Section 3.0, [Alternative Performance Standards for Waste Destruction in Industrial Utility Boilers](#), in this chapter are exempt from specific requirements as noted.

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## 1.0 Operational Requirements

**HWR Section 20** For thermal facilities and incinerators, the operational requirements are to:

- provide detailed engineering and dispersion modelling information to a director before beginning construction or installation
- conduct an approved demonstration trial before beginning operation at the facility
- have, test, and report on automatic systems to stop the feed of hazardous waste if the approved operating conditions are not met
- inspect equipment daily
- keep the thermal facility or incinerator sealed or keep the pressure in it less than atmospheric
- record and report various process conditions and specified emissions from the system and
- monitor and report ambient air quality and weather conditions

### 1.1 *Engineering and Dispersion Modelling Information*

This section does not apply to industrial utility boilers used for waste destruction.

#### **Engineering Information**

The report submitted to a director before beginning construction or installation of a facility must include information on:

- equipment manufacturer
- technology used
- physical size and configuration
- any fuel and waste feed systems
- air supply systems
- automatic safety cutoff systems
- exhaust gas monitoring and pollution control systems
- burner design if the facility is an incinerator
- construction materials and
- process measurement and control systems

Any other information that may help in describing the process should also be included to provide a complete picture of the facility.

#### **Dispersion Modelling Information**

The report must contain a prediction of the maximum ground level concentration of any contaminants emitted to the atmosphere for various weather conditions. Computerized dispersion models are usually used for this purpose. The dispersion model and the calculations must be approved by a director.

### 1.2 *Demonstration Trials*

This section does not apply to industrial utility boilers used for waste destruction.

#### **Trial Protocol**

Demonstration trials must be conducted to demonstrate the effectiveness of the facility. The proposed method for conducting the demonstration trial, often called the *trial protocol*, must be approved by a director before the trial is run. However, the trials do not have to be run in BC. The results of trials in other jurisdictions may be accepted if the procedures meet a director's requirements.

To be an adequate test, the trial protocol must cover all worst-case conditions that could occur, including a trial with the most difficult waste intended for treatment at the facility. The principal organic hazardous constituents (POHCs) used in the trial are specified by a director.

If a director thinks that a trial could be dangerous, the facility operator may have to first conduct a trial using non-hazardous materials. After there is enough evidence to show that the process is safe with non-hazardous materials, the trial may proceed with hazardous wastes.

#### **Trial Objectives**

The objective of the demonstration trial is to show that the facility is capable of destroying or removing all hazardous constituents from the waste and to verify the concentrations of POHCs in any emissions, effluents, or solid residues.

#### **Destruction and Removal Efficiency**

The effectiveness of the process is measured by calculating the *destruction and removal efficiency* as shown below:

$$DRE = \frac{W_{in} - W_{out}}{W_{in}} \times 100\% \quad \text{Equation 1}$$

where:

$DRE$  = destruction and removal efficiency in per cent

$W_{in}$  = inlet mass rate of a designated POHC in the waste feed

$W_{out}$  = outlet mass rate of the same POHC in the exhaust emissions

**Combustion Efficiency and Operating Conditions**

For incineration processes, the demonstration trial must show that the combustion of the waste is complete and efficient. Combustion efficiency is calculated according to the following equation:

$$CE = \frac{CO_2}{CO_2 + CO} \times 100\% \quad \text{Equation 2}$$

where:

CE = combustion efficiency in per cent

CO<sub>2</sub> = concentration of carbon dioxide in the exhaust gases

CO = concentration of carbon monoxide in the exhaust gases

When incineration is efficient, oxygen combines with carbon in the waste to form carbon dioxide. Carbon monoxide forms if there is poor mixing of gases or not enough oxygen. Combustion efficiency is a simple check on the completeness of the incineration process.

Calculation of combustion efficiency is not required for processes that produce carbon dioxide from sources other than combustion. An example is a lime kiln. In these cases the carbon dioxide produced by the other sources cannot be identified separately from that produced by the incineration. As a result, the carbon dioxide concentration coming from waste combustion cannot be measured.

**Process Measurements**

In each demonstration trial, the temperature of the reaction zone, the residence time of the waste in that zone, and the concentration of oxygen in the exhaust gases must be measured during the periods used to calculate the DRE. These parameters are important for setting the approved operating conditions.

**Identification of PICs**

The demonstration trial must identify any significant products of incomplete combustion (PICs) in any emissions, effluents, or solid residues. PICs are compounds that are not normally part of the original waste and may be as hazardous as or more hazardous than the original waste.

PICs are created from fragments of partially destroyed waste or fuel molecules that are not completely burnt. Incomplete burning most often occurs when incineration temperatures are low or if the waste is not heated for enough time. A director may set limits for PICs.

**Air Emission and Atmospheric Measurements**

During the trial, emissions to the air must be tested for the parameters specified in Schedule 2 of the HW Regulation. These are also shown in [Figure 8, Emission Standards for Incinerators and Other Thermal Facilities](#).

Atmospheric conditions and ambient concentrations of contaminants also need to be measured during the trial. Parameters that must be measured include:

- atmospheric temperature, pressure, wind direction, and speed
- concentrations of POHCs and PICs and
- any other parameters required by a director

These measurements are needed to verify the predictions of the dispersion model.

***Effluent Measurements***

Any effluent discharged from the facility during the trial must be tested to measure the concentrations of all POHCs, PICs, and other parameters specified in Schedule 1.2 of the HW Regulation. These parameters are also shown in [Figure 7, Effluent Standards for Hazardous Waste Facilities](#).

### **1.3 Safety Requirements**

***HWR Sections 20(4) to 20(6)***

As with other facilities, incinerators and thermal treatment units must have some automatic means of shutting down the operation if an upset occurs. The automatic cutoff system must be tested weekly and any problem with this system must be reported to a director.

The facility and all associated equipment must be inspected daily for leaks or other problems. Leaks and fugitive emissions must be controlled by keeping the works sealed or under slight negative pressure.

### **1.4 Monitoring Requirements**

***HWR Sections 20(8) to (11)***

A facility must operate within a specific set of conditions, which must be monitored. Process parameters that the HW Regulation specifies must be measured continuously include:

- combustion zone temperature
- waste feed rate
- exhaust gas flow rate and
- concentrations of carbon dioxide, carbon monoxide, and oxygen in the exhaust gas

Other emissions from the process may have to be measured from time to time. Where this is required, the results must be reported to a director within 60 days of doing the tests.

Monitoring of ambient air quality and atmospheric conditions is also required. Results of this monitoring must be reported to a director within 60 days of the end of each calendar quarter.

## **2.0 Performance Requirements**

***HWR Section 21***

Hazardous waste incinerators and other thermal facilities must be able to meet the performance and emission standards discussed below, in addition to any conditions imposed by a director.

***Air Emissions and Operating Conditions***

Air emissions must not exceed the standards specified in Schedule 2 of the HW Regulation. These are also shown in [Figure 8, Emission Standards for Incinerators and Other Thermal Facilities](#).

The destruction and removal efficiency, and for incinerators the combustion efficiency, must not be less than the standards listed in [Figure 9, \*Efficiency Standards for Incinerators and Other Thermal Facilities\*](#), for each parameter. In addition, the operating conditions must be maintained at the values able to achieve these efficiencies as shown in the demonstration trials.

**Effluent Discharges**

Any effluent discharged from a thermal facility must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in [Figure 7, \*Effluent Standards for Hazardous Waste Facilities\*](#).

The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.




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**Note:** Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.

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Any effluent with contaminants exceeding the applicable standards must be further treated until it does meet the standards before being discharged.

Because Schedule 1.2 does not include every possible contaminant, a director may set additional standards for specific cases.

**Management of Residues**

As with other treatment facilities, solid residues such as ash or scrubber water sludge must be managed at a hazardous waste facility, unless they are shown to the satisfaction of a director, to be non-hazardous and suitable for authorized disposal to landfill or some other approved management option.

On-site recycling, treatment at the same facility, or some other form of management, such as disposal in an off-site secure landfill or building, is acceptable. In some cases, residues may be delisted.

**Delisting of Residues**

*Delisting* a residue means proving that it no longer poses a hazard to human health or the environment. As such, deregulating a residue may be a better way of describing this process.

The process for deregulating a residue is specified in section 53 of the HW Regulation. Anyone wanting to deregulate a hazardous waste residue should contact a director. They will be advised if there is a protocol approved by a director for the type of residue concerned.




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**Note:** The deregulating process is stricter than the process for classifying hazardous waste. That is, a residue that does not exceed any criteria for classification as hazardous waste must still be managed as hazardous waste unless specifically deregulated. The operator of an incinerator or other thermal treatment facility should therefore discuss residue deregulating requirements well before disposal becomes necessary.

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Deregulated residues may be disposed of in an authorized landfill other than a secure landfill or used in some other manner according to an approved management option.

### 3.0 Alternative Performance Standards for Waste Destruction in Industrial Utility Boilers

**HWR Section 21(2)** Under certain conditions, industrial utility boilers such as pulp mill power boilers may be used to destroy wastes containing low levels of PCB or pentachlorophenol. Pentachlorophenol is sometimes called PCP.

In these cases a demonstration trial is not required and the boiler does not have to meet the performance standards specified in [Figure 8, Emission Standards for Incinerators and Other Thermal Facilities](#), and [Figure 9, Efficiency Standards for Incinerators and Other Thermal Facilities](#), as long as:

- the PCB or PCP content of the waste is less than 500 parts per million (ppm)
- the minimum rated capacity of the boiler is 15 MW
- the boiler is operated at a minimum of 90% of the design steam generating capacity when waste is fed into the boiler
- the mass flow of the wastes does not exceed 10% of the mass flow rate of fuel
- the carbon monoxide concentration in the exhaust gas is not greater than 50 ppm when using liquid or gaseous fuels or 100 ppm when using solid fuel
- the excess oxygen is a minimum of 3% when waste is burned and
- the concentration of carbon monoxide and oxygen in the exhaust gas are monitored in an approved manner



**Note:** The following requirements and standards for thermal facilities still apply:

- submission of a detailed information report prior to use with waste
  - alarm and automatic shutoff to stop the waste feed when the required operating conditions are not met
  - inspection, monitoring, and reporting and
  - performance standards for discharging liquid effluents and managing solid residues
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**Figure 8: Emission Standards for Incinerators and Other Thermal Facilities**  
From HW Regulation Schedule 2

<i>Parameter</i>	<i>Maximum Concentration<sup>(1)</sup></i> (mg/m <sup>3</sup> unless shown otherwise)	<i>Averaging Period<sup>(2)</sup></i>	<i>Monitoring Method<sup>(3)</sup></i>
Carbon monoxide	55	4-hr RA	C
Hydrogen chloride	50	8-hr RA	C
Hydrogen fluoride	4	A	A
Nitrogen oxides (as NO <sub>2</sub> )	380	A	A
Opacity	5%	1-hr RA	C
Particulate matter	20	A	A
Sulphur dioxide	180	A	A
Total hydrocarbon (as methane)	32	A	A
Trace metals <sup>(4)</sup> :			
Class I (lead, antimony, copper, manganese, vanadium, zinc)	3.6	A	A
Class II (arsenic, chromium, cobalt, nickel, selenium, tellurium)	0.7	A	A
Class III (thallium, cadmium, mercury)	0.15	A	A

**Notes:**

- (1) Concentrations are corrected to 11% oxygen and standard conditions of 20 °C, 760 mm of mercury and dry basis
- (2) Averaging period codes:
  - RA = Rolling average, which is the moving time period over which the continuous monitoring data is averaged
  - A = As approved by a director
- (3) Monitoring method codes:
  - C = continuous
  - A = as approved by a director
- (4) The concentrations prescribed apply to each individual metal

**Figure 9: Efficiency Standards for Incinerators and Other Thermal Facilities**  
From HW Regulation section 21(1)

<i>Parameter</i>	<i>Standard</i>
Destruction and removal efficiency for:	
Principal organic hazardous constituents	99.99%
Polychlorinated biphenyls	99.9999%
Polychlorinated dibenzofurans	99.9999%
Polychlorinated dibenzo-p-dioxins	99.9999%
Combustion efficiency for:	
Incinerators	99.9%







## MOBILE FACILITIES

*Mobile facilities* are most commonly either treatment or incineration units. Some are mounted on a truck or trailer and may operate for a short time before moving on to another location. Some mobile facilities take considerable time and effort to set up or take down and could be more appropriately considered transportable. If a mobile or transportable unit operates at one location for less than 1800 hours in a three-year period and processes less than 1000 tonnes in that same period, the facility qualifies for special consideration under the Hazardous Waste Regulation.

### ***Regulatory Differences for Mobile Facilities***

The main regulatory difference between facilities that qualify as mobile and those that do not relates to siting standards. The Minister may allow less restrictive siting standards for a mobile facility. Because a mobile facility is not in any one place for long, safe operation is possible with less strict requirements.

For example, a mobile facility could be operated without undue risk within a 200-year flood zone if it is known that floods are not a risk during the period of operation.

There are two additional operational requirements for mobile facilities:

- all hoses, pipes, and containers used for any hazardous waste or hazardous chemical must be drained before the unit is transported and
- testing of the emergency system must be done annually and repeated each time the unit is moved to a new location

### ***Performance Standards***

The performance standards for mobile facilities are the same as those for each individual type of facility. Thus, a mobile incinerator must meet the same performance standards as a stationary incinerator and a mobile treatment facility must meet the requirements for a stationary treatment facility.





# PILES, SURFACE IMPOUNDMENTS, & LAND TREATMENT

Piles, surface impoundments, and land treatment works are types of hazardous waste facilities where the waste is stored or treated on or in the ground. In these facilities the ground acts to provide extra containment or is a medium for biological treatment. In each of these types of facility, air pollution from vaporizing liquids or blowing solids may also be produced. Additional requirements may need to be included in the operational plan to address these issues before it is approved by a director.

A *waste pile* is a facility for storing or treating solid or *non-flowing* wastes. The main concern from an environmental point of view is the possibility of rain or snow mixing with the waste to form a leachate. The leachate could eventually move through the waste to contaminate the soil or underlying groundwater.

A *surface impoundment* is a man-made excavation or diked area used for storage of either liquids or solids. They are usually mainly made of earthen materials. Surface impoundments must also be designed and operated to prevent or at least to minimize the generation of leachate.

In a *land treatment facility*, organic waste is spread on land so that air, sunlight, and microbial organisms are freely available to decompose the waste biologically. Although the waste may contain some inorganic materials, the organic materials are the main target for treatment.

In most cases, the wastes from these three types of facilities are later removed for treatment or disposal at another location. So, like most hazardous waste facilities, these facilities must be managed with final cleanup and remediation of the site in mind.

## 1.0 Siting Requirements

**HWR Section 28** Section 28 of the HW Regulation lists the additional siting requirements that must be met by any waste pile, surface impoundment, or land treatment facility. These requirements are mainly intended to protect groundwater and surface water. For this reason, these facilities are prohibited:

- in or near wetlands
- in the case of waste piles or surface impoundments, in any place where there is less than 3 m of low-permeability soil between the bottom of these facilities and the seasonally high water table
- in the case of land treatment facilities, in any place where there is less than 1 m of low-permeability soil between the bottom of these facilities and the seasonally high water table
- in the recharge area of any high-capacity wells or of a significant number of low-capacity wells
- where there would be less than 5 m of low-permeability soil between the bottom of any of these facilities and the bedrock if the bedrock is fractured or porous
- within 150 m of any permanent surface water or
- within the watershed of a designated community water supply

## 2.0 Operational Requirements

**HWR Section 29** Waste piles, surface impoundments, and land treatment facilities need almost constant attention to make sure they are operating properly. Specific requirements are summarized below.

**Inspection and Repair** Waste piles, surface impoundments, and land treatment facilities must be:

- inspected during installation to make sure there are no problems that would later make any liners leak
- inspected weekly during operation and immediately after any storm or catastrophic event to make sure everything is in good order and to see if leachate is collecting and
- immediately repaired if any problems are found

**Monitoring and Reporting**

Waste piles, surface impoundments, and land treatment facilities must be monitored according to a program approved by a director. Requirements for the program include:

- setting up of sampling wells so that the quality of the groundwater that would be expected to be affected in event of a problem can be compared with the quality of the unaffected groundwater
- measures to prevent contamination of the sampling wells
- selection of the parameters that must be measured
- at least quarterly sampling of the wells
- measurements of groundwater levels
- detection and measurement of leachate or any liner leakage and
- reporting of all data to a director

The monitoring requirements are designed to provide a reliable means for detecting problems with the liner system. If problems are detected, they must be reported to a director within three days.

**Leachate and Runoff Collection** Any facilities for storing leachate or runoff must be emptied regularly so there is always enough capacity to collect leachate or runoff if the need arises.

## 3.0 Performance Standards for Waste Piles

**HWR Section 30** Because waste piles are used to store solids, the performance standards do not specify that there must be liners under them. However, this may be the easiest way to meet the standards, which are summarized below.

**Prohibited Materials** The following types of materials must not be stored in a waste pile:

- wastes that are or contain liquids
- ignitable or reactive wastes or
- liquids in containers

**Leachate Collection and Leak Detection** Waste piles must have systems approved by a director that are kept in good operating order and that are used to:

- contain the waste or any leachate generated at the site
- detect leaks through any required liners and
- collect leachate

<b>Groundwater Non-Compliance</b>	A waste pile is out of compliance if groundwater monitoring shows a statistically significant difference in any chemical parameter associated with the waste. Statistical methods approved by a director must be used for deciding if differences are significant.
<b>Site Drainage</b>	A waste pile must have a system to prevent storm water draining into the pile. The systems must be designed for storm events that occur on average only once every 25 years.
<b>Effluent Discharges</b>	<p>Any effluent discharged from a waste pile must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in <a href="#">Figure 7, Effluent Standards for Hazardous Waste Facilities</a>.</p> <p>The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.</p> <hr/> <p><b>!</b> <b>Note:</b> Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.</p> <hr/> <p>Any effluent with contaminants exceeding the applicable standards must be further treated until it does meet the standards before being discharged.</p> <p>Because Schedule 1.2 does not include every possible contaminant, a director may set additional standards for specific cases.</p>
<b>Dust Control</b>	A cover or other means of controlling dust may be required if waste stored on a pile could be blown away easily. The need for a cover depends on the nature of the waste.
<b>Closure</b>	<p>While a waste pile is operating, the eventual closure of the facility must be kept in mind. This closure must follow a written plan that is approved before any waste is accepted and includes:</p> <ul style="list-style-type: none"><li>• removal of any remaining hazardous waste and</li><li>• cleaning up the underlying soil to an approved depth</li></ul>

## 4.0 Performance Standards for Surface Impoundments

<b>HWR Section 31</b>	Because surface impoundments are used to store liquids, they require special attention including use of a liner system. The performance standards that particularly apply to surface impoundments are summarized below.
<b>Prohibited Materials</b>	Storage of ignitable or reactive wastes in surface impoundments is prohibited.
<b>General Features</b>	<p>Surface impoundments must have:</p> <ul style="list-style-type: none"><li>• at least 0.5 m of freeboard</li><li>• an inner fenced buffer area 20 m wide immediately around the impoundment and</li><li>• devices to immediately stop the flow of waste into the impoundment in the event of problems</li></ul>

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**Liner System** Surface impoundments must have a liner system approved by a director that:

- prevents escape of waste during operation or closure
- consists of either 0.5 m of clay or a 1 mm–thick synthetic membrane
- has chemical and physical properties so it is not damaged by the waste, operating conditions, or weather and
- is placed on base materials so that the liner is supported and not damaged by pressure gradients, compression, uplift, or settlement

**Other Standards** Performance standards related to groundwater non-compliance, leak detection and leachate collection systems, storm water management, effluent discharges, dust control, and closure are similar to those for waste piles—see section 31 of the HW Regulation or Section 3.0, [Performance Standards for Waste Piles](#), above.

### 5.0 Performance Standards for Land Treatment Facilities

**HWR Section 32** Climate and soil conditions greatly affect land treatment. For this reason, every waste treated at a particular land treatment facility must be specifically approved by a director for treatment and then only that waste treated at that facility. Restrictions on the types of wastes that may be treated at a facility are usually included in the operational plan for the facility.

Performance standards related to groundwater non-compliance, leak detection and leachate collection systems, storm water management, effluent discharges, and dust control are similar to those for waste piles—see section 32 of the HW Regulation or Section 3.0, [Performance Standards for Waste Piles](#), above.

The performance standards related to closure are also similar to waste piles, except that a director can approve alternatives to:

- removal of any remaining hazardous waste and
- cleaning up the underlying soil to an approved depth



# SECURE LANDFILLS

A secure landfill is often the final disposal option for any wastes that cannot be further reduced or made less hazardous. It is a facility designed, constructed, and operated to keep wastes confined for an indefinite period of time with little likelihood of future removal. For this reason, secure landfills have some of the strictest requirements under the Hazardous Waste (HW) Regulation. Some of these requirements are shown in [Figure 10, Secure Landfill Requirements](#).

## 1.0 Permit Requirement

With the exception of an on-site hazardous waste landfill associated with contaminated site remediation activities at that site, to operate, a secure landfill must have a permit issued under section 14 of the *Environmental Management Act*. Among other things, the permit may require any of the following:

- submission of plans and specifications for the landfill
- repair, alteration, or improvement of the landfill
- financial security in whatever form or amount or under whatever conditions a director decides
- monitoring according to specified methods of any aspect of operation that a director thinks is important
- studies or reporting of information specified by a director or
- recycling or recovery of reusable resources

An on-site hazardous waste landfill associated with contaminated site remediation activities while not requiring a permit, is still subject to all applicable requirements of the HW Regulation.

## 2.0 Siting Requirements

### ***HWR Sections 3 and 25***

Secure landfills must meet very strict siting requirements. Some of the requirements are those that all types of hazardous waste facilities must meet. They are given in section 3 of the HW Regulation and are discussed in Section 3.0, [Siting Standards](#), in Chapter 8.

Additional requirements specific to secure landfills are given in section 25 of the HW Regulation and are summarized below.

### ***Wetlands***

A secure landfill may not be located in a wetland or in an area adjacent to a wetland. A *wetland* is any land like a tidal flat, marsh, or bog that is often flooded with water.

### ***Severe Earthquake Zones***

Location of a secure landfill in a severe earthquake zone is prohibited. This is defined as an area where there is a 10% probability that a predicted peak ground acceleration of more than 8% of gravity will be exceeded in 50 years.

Information on ground acceleration during earthquakes may be accessed from the [Earthquake Information](#) page of the Pacific Geoscience Centre web site. Calculations for specific sites are available for a nominal fee from the Centre.

### ***Separation from Ground and Surface Water***

The bottom liner of a secure landfill must be separated from the seasonally high water table by at least 3 m of soil with permeability less than  $1 \times 10^{-6}$  cm/s. If the underlying rock is fractured or permeable, this separation must be increased to at least 5 m.

In addition, a secure landfill may not be located:

- in the recharge area of any high-capacity wells or of a significant number of low-capacity wells
- within 300 m of any surface water or
- within the watershed of a designated community water supply

**Allowable Precipitation**

Rain or snow falling on a secure landfill after it has been closed must not generate leachate. This restriction is expressed in the following equations.

On a monthly basis:  $P_t < E_t + W_s$  Equation 3

On an annual basis:  $P_t < E_t$  Equation 4

where:

$P_t$  = the precipitation falling on the surface of the closed landfill

$E_t$  = the maximum water loss from the surface of the closed landfill by evaporation and transpiration and

$W_s$  = the water holding capacity of the soil used for the final cover.

Before a secure landfill may be located in a given area, there must be data for all the variables in these equations. If the data do not exist for the site, they must be measured at the proposed site or calculated from data collected in areas with similar weather conditions.

**Buffer Zone**

There must be an approved buffer zone around a secure landfill to separate it from other land uses in the area. The zone must be controlled or owned by the facility operator or the government.

The HW Regulation does not specify the size of the buffer zone because it depends on the local situation. For example, a secure landfill near a salmon spawning area would have a larger buffer than one located away from any environmentally sensitive areas.

### 3.0 Operational Requirements

**HWR Section 26**

Because secure landfills are intended to be permanent, they have the strictest operational requirements of any facilities covered by the HW Regulation. Although in some cases allowance is made to recover wastes in the future, wastes are not usually ever removed. The operational requirements must therefore make sure that the facility will always contain the waste. The full requirements are given in section 26 of the HW Regulation. These are summarized below.

**Inspection and Repair**

Secure landfills must be:

- inspected during installation to make sure there are no problems that would later make the liners and covers leak
- inspected weekly during operation and immediately after any catastrophic event such as a severe storm, earthquake, or forest fire, to make sure everything is in good order and to see if leachate is collecting and
- immediately repaired if any problems are found



<b>Monitoring and Reporting</b>	<p>Secure landfills must be monitored according to a program approved by a director. Requirements for the program include:</p> <ul style="list-style-type: none"><li>• setting up of sampling wells so that the quality of the groundwater that would be expected to be affected in event of a problem may be compared with the quality of the unaffected groundwater</li><li>• measures to prevent contamination of the sampling wells</li><li>• selection of the parameters that must be measured</li><li>• at least quarterly sampling of the wells</li><li>• measurements of groundwater levels</li><li>• detection and measurement of leachate or any leakage into the space between the liners and</li><li>• reporting of all data to a director</li></ul> <p>The monitoring requirements are designed to provide a reliable means for detecting problems with the liner system. If problems are detected, they must be reported to a director within three days.</p>
<b>Cover When Filling Cells</b>	<p>While cells are being filled with waste, there must be some way to prevent generation of leachate. The simplest concept for doing this is to use a cover to keep out rain or snow, but other effective means may be used.</p> <p>The system must be kept in place until the final cover of the secure landfill is placed on each cell.</p>
<b>Waste Location</b>	<p>In case a particular waste needs to be found at some future time, records must be kept of the contents of each landfill cell. These records may be in the form of a three-dimensional map or similar system.</p>
<b>Leachate and Runoff Collection</b>	<p>Any facilities for storage of leachate or runoff must be emptied regularly so there is always enough capacity to collect leachate or runoff if the need arises.</p>

## 4.0 Performance Standards

<b>HWR Section 27</b>	<p>As with the siting and operational requirements, the performance standards for secure landfills are intended to completely and permanently contain the wastes put in them. Section 27 of the HW Regulation specifies multiple levels of protection for a secure landfill as shown in <a href="#">Figure 10, Secure Landfill Requirements</a>, and as highlighted below.</p>
<b>Prohibited Materials</b>	<p>Schedule 3 of the HW Regulation prohibits disposal of some types of hazardous wastes in a secure landfill. In summary, these are:</p> <ul style="list-style-type: none"><li>• wastes that are liquids or that contain free liquids, whether or not these wastes are in containers</li><li>• empty waste containers, unless they are compacted as much as possible</li><li>• ignitable or reactive wastes</li><li>• wastes containing more than 1% total organic carbon, other than organic carbon that occurs naturally in soil or in a substance that is not hazardous waste</li><li>• wastes containing more than 1000 mg/kg of halogenated organic compounds</li><li>• radioactive wastes or</li><li>• wastes that produce undesirable leachate easily on contact with water</li></ul> <p>These above wastes are better handled at other facilities and could cause problems if put in a secure landfill.</p>

A modified leachate extraction procedure given in Schedule 4 of the HW Regulation is used to test for undesirable leaching.

**Dual Liner System** Secure landfills must have a dual liner system that:

- prevents escape of waste during operation or closure
- uses either 0.5 m of clay or a 1 mm–thick synthetic membrane for each liner
- has chemical and physical properties so that neither liner is damaged by the waste, operating conditions, or weather and
- is placed on base materials so that the liners are supported and not damaged by pressure gradients, compression, uplift, or settlement

**Leachate Collection and Leak Detection** Secure landfills must have systems for:

- detecting liquid in the space between the two liners
- collecting leachate from above the upper liner and
- storing removed leachate

The leachate collection system must:

- be installed at a slope greater than 2%, in a porous layer at least 0.75 m thick having a permeability greater than  $1 \times 10^{-3}$  cm/s
- have chemical and physical properties so that the system is not damaged by the waste, any leachate, or the weight of material in the landfill and
- not clog during the life of the landfill

**Groundwater Non-Compliance**

A secure landfill is out of compliance if groundwater monitoring shows a statistically significant difference in any chemical parameter associated with the waste. Statistical methods approved by a director must be used for deciding if differences are significant.

**Site Drainage** A secure landfill must have systems to:

- prevent storm water draining onto any cell and
- collect and control water draining from any cells

These systems must be designed for storm events that occur on average only once every 25 years.

**Effluent Discharges** Any effluent discharged from a secure landfill must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in [Figure 7, Effluent Standards for Hazardous Waste Facilities](#).

The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.



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**Note:** Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.

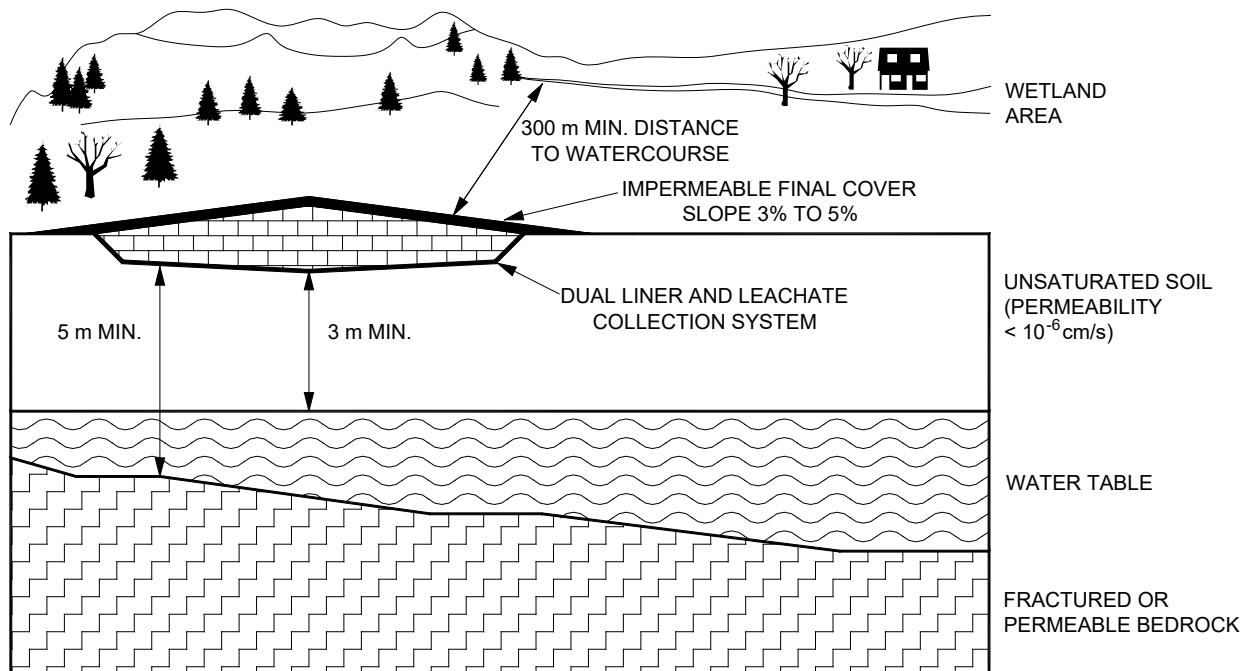
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Any effluent with contaminants exceeding the applicable standards must be further treated until it does meet the standards before being discharged.

Because Schedule 1.2 does not include every possible contaminant, a director may set additional standards for specific cases.

- Dust Control** A cover or other means of controlling dust may be required if waste put into a secure landfill could be blown away easily.
- Plan for Maintenance After Closure** Before a secure landfill is closed, a director must approve a plan for how it will be maintained after closure. The plan must give details for maintaining:
- the final cover
  - the leak detection system
  - the leachate collection system
  - the groundwater monitoring system
  - the drainage control system and
  - survey benchmarks
- Closure** The final closure of a secure landfill must be planned during the design phase, well before disposal of any waste occurs.
- The whole landfill or any cell must be closed by:
- making sure that all systems for collecting, storing, and monitoring leachate will work properly over the long term with minimum maintenance and
  - placing a final cover
- The final cover must require minimum maintenance and have:
- a 0.75 m–thick foundation layer to make sure the cover will be structurally sound
  - an impervious middle layer consisting of 0.5 m of clay or a 1 mm–thick synthetic membrane
  - a 0.5 m–thick top layer of soil that will not contaminate any water filtering into it and that is suitable for long-term plant growth
  - a slope of 3% to 5% so that ponds do not form on the surface and
  - vegetation that is suitable for the area, that is established by agronomic practices approved by a director, and that does not produce roots that will grow through the top soil layer
- Finally, title for the property must be transferred to the Crown after any requirements of the plan for maintenance after closure have been complied with.

Figure 10: Secure Landfill Requirements

**PROHIBITED AREAS:**

- areas within 200-year floodplains unless protected
- areas within 100 m of a Holocene fault
- areas prone to tsunamis
- areas prone to slope failure
- designated wildlife areas
- wetlands and areas adjacent to wetlands
- areas with a probability of 10% exceedance in 50 years, of a peak seismic acceleration greater than 8% of gravity
- recharge areas for high-capacity wells
- recharge areas for wells supplying fish hatcheries and other domestic and industrial uses
- designated community watersheds

**MUST HAVE:**

- monthly precipitation < (evaporation + soil storage capacity)
- annual precipitation < evaporation
- buffer zone
- dual liners, each 0.5 m clay or 1 mm synthetic membrane
- leachate detection and collection system
- portable cover or equivalent over working surface
- closure plan
- final cover consisting of 0.75 m soil, followed by 0.5 m clay or 1 mm synthetic membrane, followed by 0.5 m soil with shallow rooting vegetation



# DISPOSAL IN A SECURE BUILDING

Over the years, many designs have been proposed for systems to contain wastes for a very long time. These designs are as simple as using abandoned underground salt mines and as novel as using deep seabed burial.

Sections 33 to 35 of the Hazardous Waste (HW) Regulation allow for disposal in a secure building as an alternative to a secure landfill. The concept of this design is a permanent, above-ground structure used only for waste disposal.

A secure building for disposal could take the form of a concrete monolith, a fortified bunker, or some other type of similar structure. Disposal in a secure building has the advantage that if needed:

- the environment around the waste in storage can be controlled and modified and
- visual inspections and maintenance can be carried out

## 1.0 Security Requirement

**HWR Section 35(8)** To dispose of waste in a secure building, a director may require financial security. This security may be in whatever form or amount or under whatever conditions a director decides.

## 2.0 Siting Requirements

**HWR Section 33** The overall objective for disposal in a secure building is the same as for a secure landfill: total long-term containment of wastes. However, for disposal in a secure building, design can control factors that for a secure landfill must be controlled by siting. As a result, the siting requirements for a secure building for disposal are less strict than for secure landfills.

This is especially the case for the requirements relating to:

- control of groundwater and surface water
- severe earthquake zones and
- precipitation

Siting requirements specific to disposal in a secure building, and additional to those for all types of hazardous waste facilities (see section 3 of the HW Regulation), are given in section 33 of the HW Regulation and are summarized below.

**Wetlands** A secure building for disposal may not be located in a wetland or in an area adjacent to a wetland. A wetland is any land such as a tidal flat, marsh, or bog that is flooded with water.

**Separation from Groundwater and Surface Water** The bottom of a secure building for disposal must be separated from the seasonally high water table by at least 3 m of soil with permeability less than  $1 \times 10^{-6}$  cm/s. If the underlying rock is fractured or permeable, this separation must be increased to at least 5 m.

In addition, a secure building for disposal may not be located:

- within 100 m of any surface water or
- within the watershed of a designated community water supply

### 3.0 Operational Requirements

**HWR Section 34** The operational requirements for disposal in a secure building are very similar to those for secure landfills. The full requirements are given in section 34 of the HW Regulation. These are summarized below.

**Inspection and Repair** Secure buildings for disposal must be:

- inspected during installation to make sure the liners and other building components are constructed as intended
- inspected weekly during operation and immediately after any catastrophic event to make sure everything is in good order and
- immediately repaired if any problems are found

**Monitoring and Reporting**

Secure buildings for disposal must be monitored according to a program approved by a director. Requirements for the program include:

- setting up of sampling wells so that the quality of the groundwater that would be expected to be affected in event of a problem may be compared with the quality of the unaffected groundwater
- measures to prevent contamination of the sampling wells
- selection of the parameters that must be measured
- at least quarterly sampling of the wells
- measurements of groundwater levels and
- reporting of all data to a director

The monitoring requirements are designed to provide a reliable means for detecting problems. If problems are detected, they must be reported to a director within three days.

**Waste Location**

In case a particular waste needs to be found at some time in the future, records must be kept of the location of all wastes in the facility. These records must be in tabular and graphic form, and referenced to permanent benchmarks.

### 4.0 Performance Standards

**HWR Section 35** As with the siting and operational requirements, the performance standards for disposal in a secure building are intended to completely and permanently contain the wastes put in them. The full requirements are given in section 35 of the HW Regulation. These are summarized below.

**Prohibited Materials**

Schedule 3 of the HW Regulation prohibits disposal of some type of hazardous wastes in a secure building. In summary, these are:

- wastes that are liquids or that contain free liquids, whether or not these wastes are in containers
- empty waste containers unless they are compacted as much as possible
- ignitable or reactive wastes
- wastes containing more than 1% total organic carbon, other than organic carbon that occurs naturally in soil or in a substance that is not hazardous waste
- wastes containing more than 1000 mg/kg of halogenated organic compounds
- radioactive wastes or
- wastes that produce undesirable leachate easily on contact with water

The above wastes are better handled at other facilities and could cause problems if put in the landfill.

A modified leachate extraction procedure given in Schedule 4 of the HW Regulation is used to test for undesirable leaching.

**Liner System** Secure buildings for disposal must have at least a single liner system that:

- prevents escape of waste during operation or closure
- consists of either 0.5 m of clay or a 1 mm–thick synthetic membrane
- has chemical and physical properties so that the liner is not damaged by the waste, operating conditions, or weather and
- is placed on base materials so that the liner is supported and not damaged by pressure gradients, compression, uplift, or settlement

**Groundwater Non-Compliance** A secure building for disposal is out of compliance if groundwater monitoring shows a statistically significant difference in any chemical parameter associated with the waste. Statistical methods approved by a director must be used for deciding if differences are significant.

**Site Drainage** A secure building for disposal must have a system to prevent storm water draining into the facility. The system must be designed for storm events that occur on average only once every 25 years.

**Effluent Discharges** Any effluent discharged from disposal in a secure building must meet the applicable standards given in Schedule 1.2 of the HW Regulation. These standards are also shown in [Figure 7, Effluent Standards for Hazardous Waste Facilities](#).

The standards that apply depend on whether the effluent is discharged to the environment or to effluent treatment works.




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**Note:** Schedule 1.2 specifies minimum standards. Operators of municipal or industrial treatment works may specify more restrictive standards for discharges into their works.

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Any effluent with contaminants exceeding the applicable standards must be further treated until it does meet the standards before being discharged.

Because Schedule 1.2 does not include every possible contaminant, a director may set additional standards for specific cases.

**Plan for Maintenance after Closure** Before a secure building for disposal is closed, a director must approve a plan for how it will be maintained after closure. The plan must give details for maintaining:

- the entire structure, including making repairs if needed
- the groundwater monitoring system
- the drainage control system and
- permanent benchmarks used for locating wastes

**Closure** After any requirements of the plan for maintenance after closure have been complied with, title for the property must be transferred to the Crown.







## PROHIBITED MANAGEMENT PRACTICES

The Hazardous Waste (HW) Regulation specifically prohibits a number of practices. These prohibitions are found in sections 36 to 39.

### **HWR Section 36**

Mixing of hazardous waste with other materials including water, rain water, or waste, or dividing hazardous waste *to evade this regulation or similar regulations in another jurisdiction* is prohibited.



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**Note:** In section 36, *to evade this regulation* are key words.

For example, removal of some waste for laboratory analysis so it can be treated properly is *division*, but this is not intended to evade the HW Regulation.

Similarly, there is *mixing* when collecting a bulk load of oil. This does not evade the HW Regulation if the mixing is not intended to make part of the load suitable for a purpose that it could not otherwise be used for.

In contrast, dividing and storing a waste in multiple parts to avoid registering it, is *division* with intent to evade the HW Regulation.

Similarly, mixing a small amount of highly contaminated oil into a bulk load of waste oil so that the highly contaminated oil can be burnt as a fuel, is *mixing* with intent to evade the HW Regulation.

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### **HWR Section 37**

Injection of hazardous waste into underground rock or soil formations for treatment, storage, or disposal is prohibited by the HW Regulation.

However, section 7 of the Oil and Gas Waste Regulation makes some limited exceptions to this general prohibition. These exceptions relate to water produced by an oil or gas well, or used to maintain or increase production from an oil or gas well.

### **HWR Section 38**

Operation of any hazardous waste facility on a fresh water body is prohibited. However, the HW Regulation makes it clear that this does not prevent hazardous waste from being transported over fresh water.

### **HWR Section 39**

Discharge of any hazardous waste into any municipal landfill or sewer system is prohibited unless it is expressly authorized by a permit, approval, regulation, or waste management plan approved by the appropriate authority. For example, in the case of permits or approvals, this is a director.





# SPECIFIC HAZARDOUS WASTES

Sections 39.1 to 42.4 of the Hazardous Waste (HW) Regulation allow alternative options for managing six specific types of hazardous wastes:

- waste asbestos
- waste oil
- hydrocarbon contaminated soil
- wastes containing pest control products, including waste containers for these products
- waste paint and
- household hazardous waste

The above wastes are common and make up a large part of all hazardous waste. The options for these wastes allow them to be managed safely without excessive administration. In addition, for residual amounts of solvents, flammable liquids, oils, oil filters, oil containers, paints, pesticides, and pharmaceuticals, return to a retailer may be possible as part of a product stewardship program required by the Recycling Regulation.

## 1.0 Waste Asbestos

The HW Regulation defines any waste containing 1% or more of friable asbestos fibres or asbestos dust as hazardous waste. *Friable* means easily crumbled and is a key word. Any asbestos that is tightly bound in a solid such as cement or hardboard is not hazardous waste.

US Environmental Protection Agency *Method 600-R-93-116* or US National Institute for Occupational Safety and Health *Method 9002* are approved in the HW Regulation for testing the percent of friable asbestos.

### **HWR Section 40**

Release of fibres or dust that could be inhaled is the main concern with waste asbestos. The HW Regulation therefore provides an option to eliminate this hazard during transport and disposal. Waste asbestos that is not mixed with any other hazardous materials may be transported and disposed at any authorized landfill provided that all of the following conditions are met:

- the asbestos is completely contained during handling, storage, and transport
- the asbestos is buried immediately at the landfill with 0.5 m of cover material and
- the disposal is approved by the landfill operator and a director

Examples of acceptable ways of completely containing the waste asbestos are:

- saturating the asbestos with water and sealing it into a non-leaking drum or
- putting dry asbestos into a 6-mil plastic bag that is sealed, and then sealing this inside a non-reusable drum or a second 6-mil plastic bag



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**Note:** Section 39.1 of the HW Regulation allows for requirements alternate to those contained in Parts 2, 3, and 4 for waste asbestos. Other parts of the HW Regulation still apply. In addition, in some cases a director may decide that a particular alternate requirement should not apply. If the alternative requirements cannot be met, waste asbestos must be managed in the same way as any other hazardous waste.

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## 2.0 Waste Oil

*Waste oil* is defined as waste that contains more than 3% by weight of refined mineral oil where the oil has become unsuitable for its original purpose owing to impurities or loss of original properties.

Diesel fuel, kerosene, home heating oil, cutting oil, hydraulic oil, and automotive lubricating oil and non-hazardous materials containing more than 3% of these oils are all hazardous wastes when they are no longer used for their original purposes.

In the past, waste oil was often poured down sewers, burned as a fuel, or spread on roads as a dust suppressant. It was then realized that the contaminants in waste oil may be dangerous to human health and the environment. Typical contaminants include flammable solvents, heavy metals, and halogenated organics such as PCBs. All of these get into the oil during manufacturing, use, or improper handling. Because of these contaminants, waste oil must be closely regulated.

If the non-hazardous material containing one of the above oils is soil, sand, or similar naturally occurring material, the waste oil may qualify for management as *hydrocarbon contaminated soil*. See Section 3.0, [Hydrocarbon Contaminated Soil](#), next in this chapter for more details.

If waste oils are contaminated with hazardous materials, the situation is more complex. See Section 5.0, [Waste Classification Procedure](#), in Chapter 3 for the steps needed to check if the waste qualifies as waste oil or if it is some other type of hazardous waste.



**Tip:** Waste oil that is in class 3 under the Transportation of Dangerous Goods Regulations still qualifies for the uses allowed in section 41 of the HW Regulation as long as it meets the definition for waste oil and any specifications that apply for the use concerned. However, waste oil in class 3 may need extra precautions to make sure it is used safely.

### **HWR Section 41**

The HW Regulation allows the use of waste oil for making pavement or for burning as fuel as long as the conditions for the type of use are met. These are summarized below.



**Note:** If any analysis is required, this must use methods specified in the regulation—see Section 2.0. [Waste Composition, Properties, and Origin](#) in Chapter 3.

### **Manufacture of Pavement**

Waste oil used in making pavement must meet the specifications given in [Figure 11, Waste Oil Specifications for Manufacture of Pavement](#).

### **Incineration as a Fuel**

Waste oil burnt as fuel must meet the specifications given in [Figure 12, Waste Oil Specifications for Use as Fuel](#), for the type of fuel use concerned.

Because burning releases contaminants directly to the atmosphere, the specifications in [Figure 12](#) are very strict. They are so strict that in most cases waste oil must be re-refined before it may be used as a fuel. The benefit is that facilities using such oil are not regulated as thermal facilities or incinerators.

Mixing or blending of waste oil with product fuel for use or sale as fuel is allowed, provided:

- the product fuel is a hydrocarbon for which a Canadian General Standards Board fuel specification exists
- the waste oil before any *mixing or blending* meets the specifications given in [Figure 11, Waste Oil Specifications for Manufacture of Pavement](#)
- a written record is kept showing the waste oil meets the required specifications

Mixing or blending of waste oil with something other than product fuel as described above may be allowed, provided this is approved in advance by a director.




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**Note:** Section 39.1 of the HW Regulation allows for requirements alternate to those contained in Parts 2, 3, and 4 for waste oil. Other parts of the HW Regulation still apply. In addition, in some cases a director may decide that a particular alternate requirement should not apply. If the alternative requirements cannot be met, waste oil must be managed in the same way as any other hazardous waste.

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### 3.0 Hydrocarbon Contaminated Soil

The HW Regulation defines *hydrocarbon contaminated soil* as “soil, sand, gravel, rock or similar naturally occurring materials which is contaminated only with a petroleum product...” This definition means that some hazardous wastes that meet the definition of waste oil or leachable toxic waste under the HW Regulation are also hydrocarbon contaminated soil.

#### **HWR Section 41.1**

The HW Regulation allows various options for managing hydrocarbon contaminated soil as long as the conditions for managing the soil are met. These are summarized below.

#### **Use in Manufacture of Asphalt**

Hydrocarbon contaminated soil may be used for making asphalt as long as:

- the soil is hazardous waste only because it contains one or more of the contaminants listed in [Figure 13, Standards for Management of Hydrocarbon Contaminated Soil](#)
- none of these contaminants exceeds the standards specified in [Figure 13](#) and
- on any day, the amount of contaminated soil is not more than 10% of all materials put into the asphalt plant

#### **Treatment and Storage**

Hydrocarbon contaminated soil may be treated or stored as long as:

- the soil is hazardous waste only because it contains one or more of the contaminants listed in [Figure 13, Standards for Management of Hydrocarbon Contaminated Soil](#)
- none of these contaminants exceeds the standards specified in [Figure 13](#)
- the treatment and storage occurs on the site where the contaminated soil was generated or at an authorized landfill or storage facility
- notification is provided to a director and management is in accordance with the requirements of a director and
- the contaminated soil is spread in single layers, each of which is:
  - not more than 0.3 m thick in any year, or

- in a greater thickness approved by a director and the approval specifies a method of aeration

Hydrocarbon contaminated soil that has been treated so that it is no longer hazardous waste may be disposed of in a landfill if the disposal:

- is approved by the landfill owner and a director before it takes place and
- is in accordance with the requirements specified by a director



**Note:** Section 39.1 of the HW Regulation allows for requirements alternate to those contained in Parts 2, 3, and 4 for hydrocarbon contaminated soil. Other parts of the HW Regulation still apply. In addition, in some cases a director may decide that a particular alternate requirement should not apply. If the alternative requirements cannot be met, hydrocarbon contaminated soil must be managed in the same way as any other hazardous waste.

## 4.0 Wastes Containing Pest Control Products

Pesticides are products widely used in industry and the home for controlling pests. The HW Regulation defines a *pest control product* as any of the thousands of products registered under the federal *Pest Control Products Act*. The HW Regulation allows for disposal of wastes containing pesticides in a manner that is safe but yet does not require an undue amount of administrative supervision. This includes waste containers that were used for pesticides.

Although the HW Regulation does not apply to amounts of wastes less than 5 L or 5 kg, it is good practice to follow the procedures in this chapter for household amounts as well. This includes returning residual amounts of pesticides to a retailer as part of a product stewardship program required by the Recycling Regulation or taking them to a household hazardous waste collection facility if they were used in a home.

The HW Regulation also states that pesticide containers are not hazardous wastes if they are emptied and:

- rinsed in the ways discussed in this section or
- labelled *Domestic* by the manufacturer

**HWR Section 42** Section 42 defines some terms relating to disposal. These are reviewed below.

**Appropriate Solvent** An appropriate solvent is any solvent such as water that dissolves the pesticide. It should be compatible with the carrier fluids in the pesticide and should not be a hazardous waste itself.

**Empty** Under the HW Regulation, to *empty* a container means to do one of the following:

- drain a liquid container into a mixing tank for not less than 30 seconds
- shake residues from an inner liner into a mixing tank or
- use all of the contents of a pressurized container without puncturing it

**Rinse** Under the HW Regulation, to *rinse* a container means to do all of the following in order:

- fill not less than 20% of the container with an appropriate solvent
- close and shake the container so that all inside surfaces are contacted with the solvent and

- empty the container as defined above

**Pressure Rinse** Under the HW Regulation, to *pressure rinse* a container means to use a pressurized spray of appropriate solvent for 30 seconds to rinse the inside of a container.

**Disposal of Containers** Before a pesticide container may be disposed of in approved landfill, it must be rinsed as specified in [Figure 14, Methods for Rinsing Waste Pesticide Containers](#), according to the type of container concerned.

For example, pressurized containers such as spray cans and containers that are labelled *Domestic* do not need to be rinsed. Any container not described in the table must be rinsed by a method approved by a director.

If reuse or recycle of containers is not practical, empty rinsed containers may be disposed of by burial as long as:

- the place of burial is on land owned or leased by the person owning the container, or in a tree farm licence owned, leased, or maintained by the person owning the container
- the place of burial is on flat ground, not in a swale, and at least 200 m from surface water or a well
- the ground does not consist of gravel, sand, or similarly porous material and
- the containers are covered with at least 0.5 m of soil immediately after burial

Empty rinsed containers may also be recycled, but such containers may not be suitable for all purposes.

**Disposal of Rinse Solution** Wherever possible, the rinse solution should be used in the mixing of the pesticide. If this cannot be done, the rinse solution may be disposed without further approval, as long as:

- the place of disposal is on the land where the pesticide was used
- the place of disposal is on flat ground, not in a swale, and at least 200 m from surface water or a well and
- the ground does not consist of gravel, sand, or similarly porous material




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**Note:** Section 39.1 of the HW Regulation allows for requirements alternate to those contained in Parts 2, 3, and 4 for wastes containing pest control products. Other parts of the HW Regulation still apply. In addition, in some cases a director may decide that a particular alternate requirement should not apply. If the alternative requirements cannot be met, wastes containing pesticides must be managed in the same way as any other hazardous waste.

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## 5.0 Waste Paint

Waste paint and related materials are hazardous waste if they are no longer used for their original purpose and are dangerous goods regulated by the Transportation of Dangerous Goods (TDG) Regulations. These materials could be in TDG classes 3, 8, or 9. See [Section 5.0, Waste Classification Procedure](#), in Chapter 3 for the steps needed to check if wastes are dangerous goods regulated by the TDG Regulations.

**HWR Section 42.1** Section 42.1 of the HW Regulation allows the use of less strict options for treating or recycling waste paint that is hazardous waste as long as the conditions for the method of management are met. These are summarized below.

**Treatment** Facilities treating waste paint and related materials qualify for less strict management options as long as they are owned and operated by a paint manufacturer or formulator.

**Recycling** Facilities recycling waste paint and related materials qualify for less strict management options as long as:

- contaminants in the waste paint do not exceed the specifications given in [Figure 15, Waste Paint Specifications for Recycling](#)
- records of the amounts of waste paint recycled are maintained for two years from the date the paint is recycled and
- the amounts recycled are reported to a director within 31 days of the end of the calendar year



**Note:** Section 39.1 of the HW Regulation allows for requirements alternate to those contained in Parts 2, 3, and 4 for waste paint. Other parts of the HW Regulation still apply. In addition, in some cases a director may decide that a particular alternate requirement should not apply. If the alternative requirements cannot be met, waste paint and related materials must be managed in the same way as any other hazardous waste.

## 6.0 Household Hazardous Waste

Small quantities of hazardous wastes are generated in household activities ranging from home maintenance and decorating to gardening and car repairs.

**HWR Section 42.2** The HW Regulation provides exemptions to encourage collection of these wastes while making sure that they are managed safely.

**Exemptions** Return collection facilities are exempt from the siting, operational, and performance requirements contained in Parts 2, 3, and 4 of the HW Regulation as long as they:

- comply with the alternate requirements in sections 42.3 and 42.4 of the HW Regulation and
- store less than 25 000 kg or 25 000 L of household hazardous waste

In addition, the requirements in section 10 of the *Environmental Management Act* to use a manifest and a transport licence do not apply as long as household hazardous waste is transported directly to a facility from:

- a residence on a residential property by the resident or
- a farm by the farmer

**HWR Section 42.3** The requirements to set up and operate a return collection facility are summarized below.

**Information** At least 30 days before a collection facility is set up, the following information must be provided to a director and to the municipality and regional district where the facility is proposed:



- street address of the facility
- category and maximum amount of waste to be stored at the facility
- name and contact details for the facility owner
- name and contact details for a person available 24 hours in case of emergency and
- name of each carrier and hazardous waste management company that, at the start-up of the facility, will be responsible for the waste after it leaves the facility

**Registration** A generator registration number (BCG number) must be applied for, also at least 30 days before a facility is set up. This number is applied for by completing a [Form 1, Registration](#) and sending it to a director. See Chapter 4 for details.

If there is a significant change in any of the information initially sent to a director on the [Form 1, Registration](#), an updated [Form 1, Registration](#), must be completed and sent to a director. See Chapter 4 for details.

In some cases, a director may require other information to be filled in on different forms.

**Siting** A return collection facility may not be set up or operated within protected wildlife areas such as designated parks, wildlife preserves, or sanctuaries. Contact the nearest office of the Regional Operations Branch or the Parks and Protected Areas Branch in Victoria to identify boundaries of such areas.

**Facility Requirements** A return collection facility must comply with:

- the *British Columbia Building Code* and the *British Columbia Fire Code*, if the waste is stored indoors and
- all land use, building, and zoning requirements of the municipality and regional district where the facility is located

In addition, a return collection facility must have:

- protection so that collection and storage of waste is not adversely affected by the weather
- security to prevent entry of unauthorized people or animals
- an impervious spill containment system, with a capacity to hold 110% of the largest volume of free liquid in any container or tank
- a suitable controlled forced air ventilation system, if the waste is stored indoors and
- signs at each entrance

The signs at each entrance must:

- identify the facility as a return collection facility
- show the hours of operation
- list, along with any safety warnings, the categories of waste accepted at the facility
- give the name and telephone number of the owner of the facility
- give a 24-hour emergency contact number and
- prohibit drop-off of materials outside the facility

**HWR Section 42.4** The operational requirements for a return collection facility are summarized below.

**Waste Records** The owner of a return collection facility must keep records of household hazardous waste stored at the facility. These records must be available for inspection by an officer at any time up to two years after the waste is removed from the facility. These records must include:

- the description, name, and state (solid, liquid, gas, or combination) of each waste
- the UN number, classification, and packing group if the wastes are dangerous goods as defined by the Transportation of Dangerous Goods Regulations and
- the amount of each waste in storage, updated at least weekly

**Storage Arrangement** Containers of hazardous waste must be stored with enough space between them so they can be inspected visually for leaks or spills.

**Facility Inspections** Return collection facilities must be inspected at least weekly for any sort of problems that could allow escape of waste or that could harm human health or the environment.

Records must be kept of these inspections. The records must show:

- the date and details of any problems found and
- the date and details of corrective action taken

**Contingency Plan** A contingency plan must be prepared for return collection facilities. The plan must:

- be kept current
- provide details of what to do in an emergency and
- be tested if required by a director

**Employee Training** Every person working in a return collection facility must have proper training related to the wastes they are expected to handle. At least one person must have proper training relating to all wastes accepted at the facility.

**Closure** Before a return collection facility can be closed, the owner must:

- give notice to a director at least 90 days before the intended closure
- prepare a plan for closing the facility and
- get the closure plan approved by a director

The facility must then be closed according to the approved closure plan.

**Figure 11: Waste Oil Specifications for Manufacture of Pavement**  
From HW Regulation section 41(2)

<i>Parameter</i>	<i>Allowable Level</i> (Levels are maximums in mg/L unless otherwise indicated)
Flashpoint	60 °C minimum
Total arsenic	20
Total cadmium	3.0
Total organic halogens (as chlorine)	2000
Total chromium	10
Total lead	1000
Total polychlorinated biphenyls	5.0
Total zinc	1000

**Figure 12: Waste Oil Specifications for Use as Fuel**  
From HW Regulation section 41(5)

<i>Parameter</i>	<i>Allowable Level for Fuel in a Cement Kiln</i> (Levels are maximums in mg/L)	<i>Allowable Level for Fuel in Uses Other than Cement Kilns</i> (Levels are maximums in mg/L)
Total arsenic	20	5.0
Total cadmium	3.0	2.0
Total organic halogens (as chlorine)	3000	1500
Total chromium	10	10
Total lead	1000	50
Total polychlorinated biphenyls	500	3.0

**Figure 13: Standards for Management of Hydrocarbon Contaminated Soil**  
From HW Regulation section 41.1(1)

<i>Parameter</i>	<i>Maximum Value</i> (Dry weight basis in mg/kg unless otherwise indicated)
Total benzene	25
Total ethylbenzene	250
Total toluene	150
Total xylene	250
Total oil†	10%

† As measured using the most recent version of the method *Determination of Waste Oil Content in Solids and Liquids for Hazardous Waste Regulation – PBM* in section D of the [BC Environmental Laboratory Manual](#) available from the Monitoring section of the Ministry’s web site.

**Figure 14: Methods for Rinsing Waste Pesticide Containers**

From HW Regulation section 42(5)

<i>Type of Container</i>	<i>Rinsing Method</i>
Rigid plastic or metal (non-pressurized)	Pressure rinse, or single rinse three times
Rigid plastic or metal (pressurized)	No rinsing required
Glass bottle	Rinse three times
Paper bag	Rinse
Plastic bag	Rinse
Containers labelled <i>Domestic</i>	No rinsing required
Any container type not listed above	As approved

**Figure 15: Waste Paint Specifications for Recycling**

From HW Regulation section 42.1(2)

<i>Parameter</i>	<i>Allowable Level</i>
Total polychlorinated biphenyls	2 mg/L
Total lead	1.00% by weight
Total mercury	75 mg/L
Total organic chlorides (as Cl)	1.00% by weight



# PERMITS AND OTHER FORMS OF AUTHORIZATION

The discharge of any waste to the environment is prohibited unless it is authorized by the *Environmental Management (EM) Act* or any of the regulations under the Act.

Types of authorizations include permits, orders, approvals, or compliance with specific regulations or waste management plans. A list and brief explanation of the various forms of authorization are given below:

**Regulations** *Regulations* are requirements issued by the Lieutenant Governor-in-Council, usually for specific types of waste or for administrative procedures that affect large sectors of the population.

**Permits** Permits are authorizations issued by a director for discharge of a specific type and amount of waste at a specific place.

**Approvals** Approvals are short-term authorizations similar to permits but valid for 15 months or less. They are usually used for testing equipment or discharges for a short time.

**Waste Management Plans** A waste management plan is an authorization issued by the Minister to a municipality for wastes managed by that municipality.

**Orders** Orders are instructions to take action beyond the terms of any other form of authorization. Section 5 of the *EM Act* gives the Minister broad authority to issue any order considered necessary to protect the environment. The orders a director may issue are specified in the *EM Act* or in regulations under the Act.

**Transport Licence** A transport licence is an authorization to transport hazardous waste issued by a director.



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**Note:** Amendments to the EM Act and the HW Regulation have mostly eliminated the permit requirements for hazardous waste management facilities.

Exceptions are:

- secure landfills, unless the landfill is associated with on-site contaminated site remediation activities (see section 24.1 of the HW Regulation), or
- unusual circumstances not explicitly addressed by existing provisions in the HW Regulation - for example in the case where an effluent or air emission discharge standard is required for a contaminant not listed in Schedule 1.2 or Schedule 2 (may require a permit or other form of authorisation)

In addition, permits or other forms of authorization may still be required for other non-hazardous waste activities, such as emission of flue gases from a boiler used to raise steam.

In event of any questions regarding the need for a permit or alternate form of authorisation for an activity not explicitly addressed in the HW Regulation, contact the nearest Regional Operations Branch office or the Environmental Protection Division office in Victoria at one of the telephone numbers given in [Appendix A](#).

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## 1.0 Applications for Permits

### **EMA Sections 14 to 20**

The process of applying for permits and other forms of authorization for management of hazardous wastes is the same as for non-hazardous wastes. Permits, approvals, and orders normally contain terms and conditions that apply to a specific case. These are in addition to the requirements of the Hazardous Waste (HW) Regulation.

For example, a permit restricts the type and amounts of waste that may be disposed of at a specific facility. Monitoring and reporting requirements are also specified in a permit. This is in contrast to a regulation that specifies requirements that apply more generally.

To apply for a permit:

- get the appropriate application forms from a director (see [Appendix A](#) for office locations)
- complete the forms, including signing and dating them
- post one copy of the completed form on a billboard at the site
- send two copies of the completed form and a site plan to a director within 15 days of signing the application
- publish the application and provide notice to the public as instructed by a director and
- provide any additional information as required by a director

The following sections describe the procedures followed in any permit application.

### **1.1 Publication and Notification**

The public must be notified of all applications for permits. The requirements for notification are given in the Public Notification (PN) Regulation.

#### **Site Notice**

Copies of the application for a permit must be posted on the proposed waste management site at a place that is very visible to the public. The PN Regulation specifies the required:

- size of the billboard
- wording on the billboard
- type size of the wording and
- colours of the wording and billboard

#### **Publication in British Columbia Gazette**

When the completed application is received by a director, it is checked for completeness and then automatically published in the *British Columbia Gazette*. At the same time, a decision is made on what further notice should be given to the public.

#### **Other Notification**

In virtually all cases, the application must be published in a local newspaper or displayed at a Canada Post office. In some cases a director may require copies of the application to be delivered directly to anyone who may be affected by the discharge or emission. The Ministry of Environment may also refer applications to other government agencies and First Nations for review.

## 1.2 Review

Ministry staff review each permit application before a formal decision is made. This review looks at the proposed management system and how it meets the requirements of the *EM Act* and regulations. Depending on the type and size of the facility, an assessment according to the regulations under the *Environmental Assessment Act* may be required.

The applicant may be asked to supply more information. Sometimes delays at the review stage can be avoided if the applicant meets with Ministry staff before sending the application.

Usually the review requires a detailed site inspection and is completed after all information and comments have been received from the public and other government agencies.

The process for permits may take anywhere from three or four months to a year or more, depending on how much information is available and how complex the application is.

Approvals and orders are generally processed in less time because there is no mandatory public notification or referral process, and the discharges are temporary in nature.



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**Note:** As a general rule, Ministry files are open to the public and anyone with a valid interest in a specific file may view the information in that file.

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## 1.3 Concerned Persons

Any persons who feel that the authorization of a waste discharge would adversely affect them may notify a director of their concerns within 30 days of the last date of posting or publication of an application. Affected persons must state in writing how they are or would be affected. Any information that may affect the decision of a director should be brought to the director's attention at this time.

A director may require the applicant to meet with any concerned persons to explain and clarify the intent of the application. Such meetings may be very small and informal or more formal if there are a large number of concerned persons.



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**Note:** A director's decision on a permit application is made based on protection of human health and the environment. Issues such as land use, job creation, economic conditions, and the like are not considered when making the decision. These issues are better dealt with elsewhere, such as in municipal council hearings, before the ombudsman, in the courts, or in the legislature.

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## 1.4 Notice of a Director's Decision

After making a decision on an application, a director will notify the applicant and anyone recognized as a concerned person. This notification of a director's decision may be either by mail or by a notice published in a local newspaper.

### 1.5 *The Appeal Process*

Anyone dissatisfied with the decision of a director may appeal to the Environmental Appeal Board. Decisions made by the Minister or the Cabinet may not be appealed to the appeal board.

An appeal is started by sending written notice of *intent to appeal* to the Chair of the Environmental Appeal Board. Notices of appeal must be sent within 30 days of the notice of the director's decision. Appeals to the Environmental Appeal Board must be accompanied by a fee of \$25 payable to the Minister of Finance.

When considering an appeal, the appeal board may hold a hearing, confirm or vary the decision being appealed, or make a new decision. If a hearing is held, the appeal board will notify the parties concerned of the date, time, and location.

The Environmental Appeal Board Procedure Regulation under the *EM Act* gives details of the procedures to be followed when the decision of a director is appealed. All hearings before the Environmental Appeal Board are open to the public, and transcripts are made of all proceedings and testimony. When the decision is reached on an appeal, written reasons are given and notice of the decision is sent to those involved in the appeal.

An appeal does not suspend or delay a decision under appeal unless the person or board hearing the appeal takes steps to set aside the original decision. Decisions of the Environmental Appeal Board are considered final except for any possible legal challenges. Although there is no formal appeal beyond the Appeal Board, the Cabinet may on its own initiative alter a decision of the Environmental Appeal Board.

## 2.0 Specific Exemptions

It is realized that the general requirements of the HW Regulation may not be reasonable in all cases. Examples are hazardous wastes arising from accidental spills or wastes classified as hazardous wastes when the wastes can be shown not to pose any significant risk to health or the environment.

Other cases may arise from technological developments or be specific to a particular case. These cases are dealt with in Part 9 of the HW Regulation as described below.

### 2.1 *Application for Change in Requirements*

#### ***HWR Section 51***

A person who feels that the normal requirements of the HW Regulation are not reasonable or should not apply in a particular case may request a change in requirements. The request is made by completing a copy of Form 4 in Schedule 5 of the HW Regulation and sending it to a director.

The applicant must show with reports, test data, or similar information why the HW Regulation is not reasonable or should not apply. To be successful, the applicant must to the satisfaction of a director show one of the following:

- the waste is not hazardous
- the facility where the waste is managed provides better protection than that offered by the HW Regulation or
- natural, site-specific conditions make the waste less hazardous



The public must be notified of applications for changes in requirements in ways similar to those used when applying for a permit.

A director may cancel or amend a decision made under section 51 if:

- new information shows that the previous decision was incorrect or incomplete
- the previous decision was made in error or
- the applicant provided significant incorrect information in the application

An applicant may also request a director to cancel a decision.

## 2.2 *Spills or Abandonment of Dangerous Goods*

**HWR Section 52** An officer responding to a spill or abandonment of dangerous goods is exempt from the administrative requirements of Part 7 of the HW Regulation. These requirements relate to registration, Provincial identification numbers, transport licences, manifesting, and the like.

Section 52 also allows a director to exempt a person from requirements of the HW Regulation in similar cases. These exemptions allow for rapid response to emergency incidents requiring management of hazardous wastes.



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**Note:** In most cases, the Spill Reporting Regulation requires spills to be reported. If dangerous goods are spilt while they are being transported, reporting is also required by the Transportation of Dangerous Goods Regulations. The exemptions under section 52 may depend on such reports having been made.

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## 2.3 *Delisting*

**HWR Section 53** The process of showing that hazardous wastes or residues from treatment of hazardous wastes do not pose any significant risk to human health or the environment is called *delisting*. As such, deregulating a residue may be a better way of describing this process. Section 53 of the HW Regulation gives a director the powers to approve methods for delisting, including specifically residues regulated by sections 19(2) or 21(3).

Hazardous wastes, classes of hazardous wastes, or residues from treatment or incineration of these wastes may only be delisted by a director based on tests carried out according to an approved method. An example of a case where delisting could be successful is using flyash from incineration of hazardous waste to make concrete blocks.

Figure 16: Authorizations for Management of Hazardous Waste

<p><b>Authorization Required for Facilities</b> (EM Act sections 5, 6, 7, 8, 9, 14, and 15)</p>	<p>All hazardous waste facilities must be operated in accordance with any of the following that apply:</p> <ul style="list-style-type: none"> <li>• a permit</li> <li>• an approval</li> <li>• an order or</li> <li>• an approved waste management plan</li> </ul> <p style="text-align: center;">and</p> <ul style="list-style-type: none"> <li>• the EM Act and</li> <li>• the HW Regulation</li> </ul>
<p><b>Exemptions</b> (HW Regulation section 2)</p>	<p>The following operations are exempt from the HW Regulation:</p> <ul style="list-style-type: none"> <li>• facilities handling less than 5 L or 5 kg of wastes except PCBs and</li> <li>• facilities handling less than 1 kg of PCB, or 100 L or 100 kg of PCB-contaminated materials</li> </ul> <p>The following operations are exempt from many requirements of the HW Regulation:</p> <ul style="list-style-type: none"> <li>• on-site treatment for volume reduction only</li> <li>• on-site recycle facilities if the material is part of the process feed or the process product</li> <li>• off-site recycle facilities if the material is less than 5% of the process feed, and</li> <li>• facilities managing mine tailings and waste rock</li> </ul> <p>An on-site hazardous waste landfill associated with contaminated site remediation activities does not require a permit but is still subject to all applicable requirements of the HW Regulation.</p>
<p><b>Registration of Hazardous Waste</b></p>	<p>Persons who in 30 days generate or at any time store, treat, recycle, or dispose of more than the registration quantity of hazardous waste must:</p> <ul style="list-style-type: none"> <li>• be registered if they have been carrying out any of these activities</li> <li>• register within 30 days if newly carrying out any of these activities and</li> <li>• use their Provincial identification number (also known as a BCG number) when shipping hazardous waste</li> </ul>
<p><b>Transport of Hazardous Waste</b></p>	<p>Carriers must have a licence to transport hazardous waste by road.</p> <p>Transport licences are not required:</p> <ul style="list-style-type: none"> <li>• for transport solely on the generator's property or</li> <li>• by generators carrying their own waste in quantities less than the registration quantity</li> </ul>
<p><b>Receipt of Hazardous Waste</b></p>	<p>Receivers of more than a registration quantity of hazardous waste must be authorized consignees who have:</p> <ul style="list-style-type: none"> <li>• a registered site number and an operational plan approved by a director, or</li> <li>• a written authorization from a director to accept hazardous waste</li> </ul>

<i>Facilities</i>	<i>Compliance Date</i>	
	Existing on 1 April 1988	New
On Site	<ul style="list-style-type: none"> <li>siting, operational and performance requirements: on a date set by the Minister</li> </ul>	1 April 1988
Off Site	<ul style="list-style-type: none"> <li>siting, operational and performance requirements: on a date set by the Minister</li> </ul>	1 April 1988
Requiring an approved operational plan	31 January 2007 for submission of plan	





## ENFORCEMENT AND PENALTIES

Regulations relating to hazardous waste are enforced by the Regional Operations Branch and the Conservation Officer Service. Complaints are investigated and spot-checks are made of waste management facilities, industrial operations, and vehicles.

### ***EMA Sections 107 to 112***

Environmental Protection Officers and Conservation Officers have the right to enter non-residential property at any reasonable time to investigate works and activities that could cause waste or pollution. In carrying out such inspections, officers may examine or remove records, conduct investigations, take samples for analysis, or take other measurements as necessary.

The *Environmental (EM) Management Act* allows officers to stop road or rail vehicles or vessels at any reasonable time and to request they be opened for inspection. If needed, a justice may issue warrants to enter property and vehicles.

Police officers may also inspect vehicles to check compliance with the *EM Act*. As a result, a vehicle and its cargo may be seized or ordered to be dealt with in any manner considered necessary. Any costs incurred in the disposal or handling of an impounded vehicle or waste will be charged to the owner.

### ***EMA Sections 115 to 117 and 120***

[Figure 17, \*Offences and Penalties\*](#), shows a list of offences and maximum penalties possible under the *EM Act*, the Hazardous Waste Regulation, or the Spill Reporting Regulation.

Figure 17: Offences and Penalties

<b>Section of EMA</b>	<b>Offence</b>	<b>Maximum Penalty</b>
6(2), 6(3), 6(4)	Causing or allowing introduction of waste into the environment without authorization.	\$1 000 000
7(1)	Not keeping hazardous waste confined in accordance with the HW Regulation.	\$1 000 000
7(2)	Releasing hazardous waste from confinement without authorization.	\$1 000 000
8	Constructing, establishing, altering, enlarging, extending, using, or operating a hazardous waste facility not in accordance with the HW Regulation.	\$1 000 000
9(1)	Storing hazardous waste not in accordance with the HW Regulation, an order, or an approved waste management plan.	\$1 000 000
9(3)	Not complying with a written order from a director to store hazardous waste in accordance with the HW Regulation or an approved waste management plan.	\$200 000
9(4)	Not complying with a written order from a director to dispose of hazardous waste in a specified way.	\$1 000 000
10(1)(a)	Failure of a shipper to comply with manifest requirements.	\$200 000
10(1)(b)	Failure of a shipper to make sure that a carrier has a transport licence.	\$200 000
10(1)(c)	Failure of a shipper to make sure that a receiving site or facility can accept hazardous waste.	\$200 000
10(2)	Failure of a carrier to comply with manifest or transport licence requirements.	\$200 000
10(3)(a)	Accepting hazardous waste without a properly completed manifest.	\$200 000
10(3)(b)	Failure of a receiver to comply with manifest requirements.	\$200 000
10(3)(c)	Accepting hazardous waste at a site where storage is prohibited, or where treatment, recycling, or introduction into the environment is not authorized.	\$300 000
79(5)	Not reporting a spill or unauthorized introduction of waste into the environment.	\$200 000
120(4)	Knowingly entering untrue or misleading information on a manifest.	\$200 000
120(5)	Resisting an officer performing duties under the <i>EM Act</i> or not complying with a requirement of an officer imposed by the Act.	\$200 000
120(6)	Releasing waste into the environment without complying with the requirements of a permit or approval.	\$1 000 000
120(7)	Not complying with requirements of a permit or approval.	\$300 000
120(10)	Not complying with a requirement imposed under the <i>EM Act</i> when ordered to do so by a director.	\$300 000
120(11)	Failure of a municipality to submit or comply with a waste management plan.	\$300 000
120(12)	Not complying with any requirement of the HW Regulation.	\$1 000 000
120(13)	Not complying with a requirement of the HW Regulation relating to the amount or characteristics of a waste introduced into the environment.	\$1 000 000
120(18)	Not complying with a substituted requirement under the HW Regulation.	\$1 000 000
126	Causing intentional damage to the environment or reckless disregard for safety causing harm.	\$3 000 000

**Other Relevant Provisions**

121(1)	When individuals are responsible for actions that cause a corporation to commit an offence, they commit an offence whether or not the corporation is convicted.
121(2)	If it is proved that an employee or agent of a corporation has committed an offence related to storing, shipping, or receiving hazardous waste, this is proof that the corporation has committed the offence unless the corporation can prove otherwise.
122	For offences under section 120, fines up to the maximum amount shown can be imposed for each day that the offence continues.
125	Additional fines may be imposed, equal to the monetary gain resulting from commission of an offence. In addition to the fines shown, individuals can be sentenced to prison for up to six months for any offence under section 120 and up to three years for an offence under section 126.



## CONTINGENCY PLANNING

Contingency planning is the process of considering what problems could occur and then putting in place:

- procedures to minimize the risk of their occurrence and
- procedures to follow in case their occurrence cannot be prevented

The aim of contingency planning is to minimize the impact of a problem event on the environment. Contingency planning can also benefit the person preparing the plan by reducing the cost of cleaning up after a problem event.

Contingency planning applies not only to hazardous wastes but also to any substance that may cause pollution.

### **EMA Section 79**

The *Environmental Management Act* gives broad powers to the Minister of Environment for managing the environment. These powers include requiring anyone who has control over a polluting substance to:

- undertake investigations of the potential risk of escape of the substance
- construct works to prevent or reduce the impact of escape of the substance
- prepare an approved contingency plan in event of escape of the substance
- test a contingency plan to see how effective it is and
- carry out the procedures in the contingency plan in the event of escape of the substance, at the expense of the persons owning, controlling, or preparing the contingency plan for the substance



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**Note:** In most cases, the Spill Reporting Regulation requires spills to be reported. If dangerous goods are spilt while they are being transported, reporting is also required by the Transportation of Dangerous Goods Regulations.

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Staff in the offices of the Regional Operations Branch review each contingency plan and assist with the development of completion schedules and information on regulatory requirements. Site inspections are normally conducted and improvements recommended where necessary.

Essential elements of a contingency plan are given elsewhere in this guide. For hazardous waste facilities, see Section 4.8, *Contingency Plan*, in Chapter 8. For transporting hazardous waste, see Section 5.2, *Responsibilities*, in Chapter 6 under carrier's responsibilities.

Anyone needing help in preparing a contingency plan should contact the nearest office of the Regional Operations Branch.







## SPILLS AND OTHER EMERGENCIES

The Spill Reporting (SR) Regulation requires reporting of spills of any materials that could cause pollution. Under the SR Regulation, a spill is any unauthorized release to the environment of a material where the amount is equal to or greater than that shown in [Figure 18, Reportable Amounts of Spilled Substances](#), in the SR Regulation column.

### **Reporting Spills to the Provincial Emergency Program**

Spills must be reported by the person who was in charge of the material before it was spilled, or by anyone observing a spill, if it appears that the spill has not been reported. The report must be made to the Provincial Emergency Program or to the local police or nearest detachment of the RCMP. The telephone number for contacting the Provincial Emergency Program is 1-800-663-3456.

Where possible, the report should include the following information:

- the name and telephone number of the person reporting the spill
- the name and telephone number of the person who caused the spill
- the time and place at which the spill occurred, together with a description of the area surrounding the spill
- the type and quantity of material spilled
- the cause and effect of the spill
- details of any response action underway, including a list of agencies on the scene or advised of the spill and
- details of further action required

Containment and clean-up should begin as soon as possible to protect human health and the environment. If the person causing the spill or local response agencies cannot respond adequately, the Minister of Environment may step in to take control. In such cases the Ministry will seek to recover the costs of actions taken from the person who caused the spill. If needed, the minister may declare an environmental emergency under the *Environment Management Act* and order services, labour, equipment, or access to land to prevent or control a spill.

In addition, the agencies listed below should also be immediately advised according to the type of incident concerned:

### **Spills to Marine Waters**

Spills to marine waters must be reported to the Canadian Coast Guard in Vancouver at 604-666-6011. *Marine waters* mean salt waters.

### **Spills or Imminent Spills of Dangerous Goods in Transport**

Spills or imminent spills of dangerous goods in transport in BC must be reported to:

- the Provincial Emergency Program at 1-800-663-3456 and the local police
- the employer of the person having control of the dangerous goods and
- the shipper of the dangerous goods

Additional reporting is required as specified in section 8.1(5) of the Transportation of Dangerous Goods Regulations depending on the mode of transport or other circumstances.



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**Note:** The amounts of substances that must be reported under the SR Regulation and the TDG Regulations are not the same in all cases.

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### **Motor Vehicle Accidents**

Motor vehicle accidents must be reported to the local police and the local fire department, if necessary.

**Figure 18: Reportable Amounts of Spilled Substances**

From SR Regulation Schedule and TDG Regulations section 8.1

<i>Spilled Substance</i>	<i>Class</i>	<i>SR Regulation</i>	<i>TDG Regulations</i>
Explosive	1	Any quantity that could pose a danger to public safety or 50 kg	See section 8.1 of the TDG Regulations
Flammable gas, other than natural gas	2.1	10 kg	Any quantity that could pose a danger to public safety or any sustained release of 10 minutes or more
Natural gas	2.1	10 kg, if there is a break in a pipeline or fitting operated above 100 psi that results in a sudden and uncontrolled release	
Non-flammable, non-toxic compressed gas	2.2	10 kg	
Toxic gas	2.3	5 kg	
Flammable liquid	3	100 L	200 L
Flammable solid	4	25 kg	
Oxidizing substance	5.1	50 kg or 50 L	
Organic peroxide	5.2	1 kg or 1 L	
Toxic substance	6.1	5 kg or 5 L	
Infectious substance	6.2	1 kg or 1 L or less if the waste poses a danger to public safety or the environment	Any quantity
Radioactive substance	7	Any quantity that could pose a danger to public safety and resulting in an emission level greater than established in section 20 of the Packaging and Transport of Nuclear Substances Regulations	
Corrosive substance	8	5 kg or 5 L	
Miscellaneous dangerous goods	9	25 kg or 25 L	
Waste containing dioxin	-	1 kg or 1 L or less if the waste poses a danger to public safety or the environment	-
Waste containing polycyclic aromatic hydrocarbons	-	5 kg or 5 L	-
Waste asbestos	-	50 kg	-
Waste oil	-	100 L	-
Waste containing a pest control product	-	5 kg or 5 L	-
PCB wastes	-	25 kg or 25 L	-
Waste containing tetrachloroethylene	-	50 kg or 50 L	-
Biomedical waste	-	1 kg or 1 L or less if the waste poses a danger to public safety or the environment	-
Other hazardous waste not listed above	-	25 kg or 25 L	-
Substance that can cause pollution, not listed above	-	200 kg or 200 L	-

## 1.0 Ministry of Environment

### *Environmental Protection Division*

Contact the offices listed below for permit and licence application forms, manifest forms, and advice regarding this guide and BC's laws and regulations for hazardous wastes.

### *Environmental Standards Branch*

PO Box 9342 Stn Prov Govt  
Victoria BC V8W 9M1

Telephone: 250-387-9955  
Email: [hazwaste@victoria1.gov.bc.ca](mailto:hazwaste@victoria1.gov.bc.ca)

Location: 2975 Jutland Rd (V8T 5J9 in case needed for courier service)

### *Offices of the Regional Operations Branch*

#### ***Southern Region***

##### **Vancouver Island**

2080A Labieux Rd  
Nanaimo BC V9T 6J9  
Telephone: 250-751-3100

##### **Lower Mainland**

200-10470 152 St  
Surrey BC V3R 0Y3  
Telephone: 604-582-5200

##### **Thompson**

1259 Dalhousie Dr  
Kamloops BC V2C 5Z5  
Telephone: 250-371-6200

##### **Okanagan**

102 Industrial Pl  
Penticton BC V2A 7C8  
Telephone: 250-490-8200

##### **Kootenay – Boundary**

401-333 Victoria St  
Nelson BC V1L 4K3  
Telephone: 250-354-6333

205 Industrial Road G  
Cranbrook BC V1C 7G5  
Telephone: 250-489-8540

##### ***LNG and Oil & Gas Team***

325-1011 4th Ave  
Prince George BC V2L 3H9  
Telephone: 250-565-6135

2080A Labieux Rd  
Nanaimo BC V9T 6J9  
Telephone: 250-751-3100

#### ***Northern Region***

##### **Cariboo**

400-640 Borland St  
Williams Lake BC V2G 4T1  
Telephone: 250-398-4530

##### **Skeena**

PO Box 5000  
Smithers BC V0J 2N0  
Telephone: 250-847-7260  
Location: 3726 Alfred Ave

##### **Omineca**

325-1011 4th Ave  
Prince George BC V2L 3H9  
Telephone: 250-565-6135

#### ***Mining Team***

400-640 Borland St  
Williams Lake BC V2G 4T1  
Telephone: 250-398-4530

#### ***Southern Interior and Northeast Projects***

200-10470 152 St  
Surrey BC V3R 0Y3  
Telephone: 604-582-5200

#### ***Southeast Projects***

PO Box 5000  
Smithers BC V0J 2N0  
Telephone: 250-847-7260  
Location: 3726 Alfred Ave

#### ***Northwest and South Coast Projects***

2080A Labieux Rd  
Nanaimo BC V9T 6J9  
Telephone: 250-751-3100

**Web Pages**

Environmental Protection & Sustainability home page  
<http://www2.gov.bc.ca/gov/content/environment>

Hazardous Waste  
<http://www2.gov.bc.ca/gov/content/environment/waste-management/hazardous-waste>

Registration of Hazardous Waste Generators and Facilities  
<http://www2.gov.bc.ca/gov/content/environment/waste-management/hazardous-waste/registration-of-hazardous-waste-generators-and-facilities>

Transport Licence Application Process  
<http://www2.gov.bc.ca/gov/content/environment/waste-management/hazardous-waste/transporting-hazardous-waste/transport-licence-application-process>

Floodplain Mapping  
[http://www.env.gov.bc.ca/wsd/data\\_searches/fpm/](http://www.env.gov.bc.ca/wsd/data_searches/fpm/)

Order in Council No. 747 (Updated Toxicity Equivalency Factors, Effective 1 November 2017)  
[http://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/updates/omnibus\\_consequential\\_oic.pdf](http://www2.gov.bc.ca/assets/gov/environment/air-land-water/site-remediation/docs/updates/omnibus_consequential_oic.pdf)

**Guides, Manuals and Forms on the Web**

*BC Environmental Laboratory Manual*  
<http://www2.gov.bc.ca/gov/content/environment/research-monitoring-reporting/monitoring/sampling-methods-quality-assurance/bc-environmental-lab-ratory-manual>

*Guideline to Generator's Registration (BCG) Applications*  
<http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/reghazwastegensfacil/bcgregistguidance.pdf>

*Manual for Completing British Columbia's Hazardous Waste Manifests and Supplementary Forms*  
<http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/legsregs/hazwastemanifestsforms.pdf>

*Plans and Specifications Guideline*  
[http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/plans\\_spec\\_guide.pdf](http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/plans_spec_guide.pdf)

*Registration Form*  
[http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/reghazwastegensfacil/reg\\_form.pdf](http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/reghazwastegensfacil/reg_form.pdf)

*Section 4 Operational Plan Guideline*  
[http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/sec4\\_op\\_plan\\_guide.pdf](http://www2.gov.bc.ca/assets/gov/environment/waste-management/hazardous-waste/hazardous-waste/resources/sec4_op_plan_guide.pdf)

## 2.0 Federal Agencies

### *Environment Canada*

#### *General Enquiries*

Contact for information on programs and services delivered by Environment Canada.

#### **Regional Office**

Environment Canada  
201 – 401 Burrard St  
Vancouver BC V6C 3S5

Telephone: 604-664-9100  
Facsimile: Varies by department—call the  
above number to inquire

#### **Web Page**

Environment Canada home page  
<http://www.ec.gc.ca/>

### *Export and Import of Hazardous Waste and Hazardous Recyclable Material*

Contact for information on transboundary movement of hazardous waste and recyclable material.

#### **Division Headquarters**

Waste Reduction & Management Division  
351 St Joseph Blvd, 9th floor  
Gatineau, QC K1A 0H3

Telephone: 844-524-5295  
Facsimile: 819-938-4555  
Email: [notification@ec.gc.ca](mailto:notification@ec.gc.ca)

#### **Web Pages**

Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations User Guide  
<https://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=5D5BE79E-1>

Hazardous Waste and Recyclable Material  
<http://www.ec.gc.ca/gdd-mw/default.asp?lang=En&n=39D0D04A-1>

Online Notification and Permit System  
<https://ec.gc.ca/gdd-mw/default.asp?lang=en&n=9AA4017D-1>

### *Natural Resources Canada*

#### *Geological Survey of Canada*

Contact for information on mapping of faults, earthquake risks and calculations.

#### **Regional Offices**

Geological Survey of Canada Pacific  
1500 – 605 Robson St  
Vancouver BC V6B 5J3

Telephone: 604-666-0529  
Facsimile: 604-666-1124

Geological Survey of Canada Pacific  
9860 West Saanich Rd  
North Saanich BC V8L 4B2

Telephone: 250-363-6500  
Facsimile: 250-363-6565

#### **Web Pages**

Geological Survey of Canada home page  
<http://www.nrcan.gc.ca/earth-sciences/science/geology/gsc/17100>

Earthquake hazard estimation page  
<http://www.earthquakescanada.nrcan.gc.ca/hazard-alea/interpolat/index-en.php>

***Transport Canada******Dangerous Goods***

Contact for information related to transport of dangerous goods.

**National Office**

Transport Canada  
Place de Ville, Tower C  
330 Sparks Street, 9th Floor  
Ottawa ON K1A 0N5

Telephone: 613-992-4624 (inquiries)  
Facsimile: Varies by department—call the  
above number to inquire

**Regional Office**

Transport Canada  
225 – 625 Agnes St  
New Westminster BC V3M 5Y4

Telephone: 604-666-2955  
Facsimile: 604-666-7747

**Web Pages**

Transport of dangerous goods home page  
<http://www.tc.gc.ca/eng/tdg/safety-menu.htm>

Transport of dangerous goods regulations  
<http://www.tc.gc.ca/eng/tdg/clear-menu-497.htm>

Canadian Transport Emergency Centre (CANUTEC)  
<http://www.tc.gc.ca/eng/canutec/menu.htm>

### 3.0 Provincial Agencies

#### ***Ministry of Public Safety and Solicitor General***

Contact for information on enforcement or compliance related to transport of dangerous goods by road.

Dangerous Goods Information  
PO Box 9250 Stn Prov Govt  
Victoria BC V8W 9J2

Telephone: 250-953-4016  
Facsimile: 250-952-0578

Location: 2nd Fl 1117 Wharf St

#### ***Provincial Emergency Program***

##### **Headquarters**

Provincial Emergency Program  
PO Box 9201 Stn Prov Govt  
Victoria BC V8W 9J1

Telephone: 250-952-4913 (enquiries)  
Facsimile: 250-952-4888

Location: 455 Boleskine Rd

#### ***Distribution Centre, Victoria***

Contact for manifest forms, other stationary and government publications related to hazardous wastes.

Distribution Centre, Victoria  
PO Box 9455 Stn Prov Govt  
Victoria BC V8W 9V7

Telephone: 250-952-4460  
Facsimile: 250-952-4442  
Email: [DCVCustomerSer@gov.bc.ca](mailto:DCVCustomerSer@gov.bc.ca)

Location: 742 Vanalman Ave (V8T 5J9 in case needed for courier service)

##### **Web Page**

Distribution Centre, Victoria

<http://www2.gov.bc.ca/gov/content/governments/services-for-government/bc-bid-resources/goods-and-services-catalogue/office-supplies-new>

#### ***Workers' Compensation Board of British Columbia***

Contact for information on occupational hazards.

Workers' Compensation Board  
Prevention Division  
PO Box 5350 Stn Terminal  
Vancouver BC V6B 5L5

Telephone: 604-276-3100 (office hours)  
Telephone: 604-273-7711 (after hours)  
Facsimile: 604-276-3247  
or contact local offices throughout the province

## 4.0 Other Organizations

### *Crown Publications Inc.*

Contact for government publications, including copies of this guide.

#### **Head Office**

Crown Publications Inc.  
106 Ontario St  
Victoria BC V8V 1M9

Telephone: 250-386-4636  
Facsimile: 250-386-0221

#### **Retail Bookstore**

Crown Publications Inc.  
521 Fort St  
Victoria BC V8W 1E7

Telephone: 250-386-4636  
Facsimile: 250-386-9720

#### **Web Page**

Crown Publications  
<https://www.crownpub.bc.ca/>

### *Recycling Council of British Columbia*

Recycling Council of British Columbia  
Shelly Building  
10 – 119 Pender St W  
Vancouver BC V6B 1S5

Telephone: 604-683-6009  
Facsimile: 604-683-7255  
Email: [rcbc@rcbc.ca](mailto:rcbc@rcbc.ca)

#### **Web Page**

Recycling Council of British Columbia  
<http://www.rcbc.ca/>



Apart from agencies, a variety of general sources of information are available concerning the management of hazardous wastes. Included are legislation, publications such as fact sheets, brochures, reports and books, and audio/visual aids. The following lists provide a general introduction to the topic of hazardous waste management.

## 1.0 Legislation

### 1.1 Provincial

- *Environmental Management Act*, SBC 2003 Chapter 53 and regulations, including:
  - Antisapstain Chemical Waste Control Regulation, BC Reg 300/90
  - Conservation Officer Service Authority Regulation, BC Reg 318/2004
  - Contaminated Sites Regulation, BC Reg 375/96
  - Environmental Appeal Board Procedure Regulation, BC Reg 1/82
  - Environmental Data Quality Assurance Regulation, BC Reg 301/90
  - Environmental Impact Assessment Regulation, BC Reg 330/81
  - Hazardous Waste Regulation, BC Reg 63/88
  - Oil and Gas Waste Regulation, BC Reg 254/2005
  - Ozone Depleting Substances and Other Halocarbons Regulation, BC Reg 387/99
  - Permit Fees Regulation, BC Reg 299/92
  - Public Notification Regulation, BC Reg 202/94
  - Spill Cost Recovery Regulation, BC Reg 250/98
  - Spill Reporting Regulation, BC Reg 263/90 and
  - Waste Discharge Regulation, BC Reg 320/2004
- *Environmental Assessment Act*, SBC 2002 Chapter 43 and regulations:
  - Concurrent Approval Regulation, BC Reg 371/2002
  - Environmental Assessment Fee Regulation, BC Reg 50/2014
  - Prescribed Time Limits Regulation, BC Reg 372/2002
  - Public Consultation Policy Regulation, BC Reg 373/2002
  - Reviewable Projects Regulation, BC Reg 370/2002 and
  - Transition Regulation, BC Reg 374/2002

### 1.2 Federal

- *Canadian Environmental Protection Act, 1999*, 1999, Chapter 33 and regulations, including:
  - Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations, SOR/2005-149
  - Interprovincial Movement of Hazardous Waste Regulations, SOR/2002-301
  - PCB Waste Export Regulations, 1996, SOR/97-109 and
  - PCB Regulations, SOR/2008-273
- *Transportation of Dangerous Goods Act*, 1992, 1992 Chapter 34 and regulations, including:
  - Transportation of Dangerous Goods Regulations, SOR/2001-286

## 2.0 Selected Reference Books

- *Recommendations on the Transport of Dangerous Goods: Model Regulations*. 19th ed. New York, New York: United Nations, 2015.



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**Note:** Although this is the most recent edition of the *UN Recommendations*, the edition referenced by the TDG Regulations as at October 2016 is the 17th revised edition.

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- *Recommendations on the Transport of Dangerous Goods: Manual of Tests and Criteria*. 6th revised ed. New York, New York: United Nations, 2015.
- Transport Canada, *2012 Emergency Response Guidebook*. Ottawa: Canadian Government Publishing [distributor]. Available as a download from [CANUTEC's ERGO 2012 page](#).
- Fingas, Mervin F., *The Basics of Oil Spill Cleanup*, 3rd ed. Boca Raton, Florida: CRC Press, 2013.
- Lewis, Richard J., Sr., *Sax's Dangerous Properties of Industrial Materials*. 12th ed. Hoboken, New Jersey: Wiley-Interscience, 2012.
- National Fire Protection Association, *Fire Protection Guide to Hazardous Materials*. 2010 ed. Boston, Massachusetts: NFPA, 2010.
- O'Neil, Maryadele J., et al. *The Merck Index: An Encyclopedia of Chemicals, Drugs, and Biologicals*. 15th ed. Royal Society of Chemistry, 2013.
- Rose, Vernon E, and Barabra Cohrssen, ed. *Patty's Industrial Hygiene and Toxicology*. 6th ed. New York, New York: Wiley, 2010.

**200-year floodplain:** land where the chance of a flood occurring in any given year is at least one in 200.

**Acid:** a proton donor. Usually a substance containing hydrogen that reacts with water to form hydrogen ions and solutions having a pH less than 7. A waste that has a pH less than 2 when measured directly or in a 50% mixture with distilled water is hazardous waste.

**Alkali:** see Base.

**Approval:** refers to an approval given under section 15 of the *Environmental Management Act*. This is an authorization similar to a permit for introducing waste into the environment, but is limited to a 15-month term, including any renewals.

**Aqueous:** relating to, similar to, containing, or dissolved in water.

**Aquifer:** a recharge area is an area of land that supplies water to an aquifer. Includes any soil or rock formation that is sufficiently porous and contains enough water to allow extraction or injection of water at reasonably useful rates.

**Authorized Consignee:** a receiver who has a registered site number and an operation plan approved by a director or written authorization from a director to accept hazardous waste.

**BCG number:** see Provincial identification number.

**Base:** a proton acceptor. Generally, a substance containing hydroxyl groups that reacts with water to form hydroxide ions and solutions having a pH greater than 7. A waste that has a pH more than 12.5 when measured directly or in a 50% mixture with distilled water is hazardous waste.

**Bioaccumulative:** a property that some substances have that cause them to accumulate in the tissues of an organism.

**Biochemical oxygen demand (BOD):** the amount of oxygen required by biological organisms to break down organic matter in the presence of air or oxygen.

**Biomagnification:** the process that occurs when substances become concentrated as they pass to higher levels of the food chain.

**Buffer zone:** land used to separate a facility from other land.

**Bulk load:** a shipment in which two or more individual hazardous waste shipments are carried together within a larger container.

**Carcinogenic:** causing cancer.

**Carrier:** a person who transports a hazardous waste.

**Chemical treatment:** a process to make hazardous waste less hazardous by chemically changing the waste.

**Chlorobiphenyls:** see PCB.

**Classification criteria:** the limit values of measured properties that determine if a substance is in one of the classes or packing/risk groups defined in Part 2 of the Transportation of Dangerous Goods (TDG) Regulations. Substances that are in one of the TDG classes are dangerous goods.

**Class:** a grouping of dangerous goods, as defined by the Transportation of Dangerous Goods Regulations.

**Closure:** actions taken by the owner or operator of a hazardous waste facility to prepare the site for long-term care after it has stopped accepting waste.

**Combustion zone temperature:** the temperature inside an incinerator where burning occurs.

**Confined aquifer:** an aquifer between layers having much lower permeability than the aquifer itself; an aquifer containing confined groundwater.

**Consignee:** the legal term for the person who receives hazardous wastes.

**Consignor:** the legal term for the person who ships or offers hazardous wastes for transport.

**Contaminated site:** an area of the land in which the soil or any groundwater lying beneath it, or the water or the underlying sediment, contains a substance in quantities or concentrations exceeding criteria, standards, or conditions specified in the Contaminated Sites (CS) Regulation or specified by the Ministry of Environment.

**Contamination:** the presence in soil, sediment, water or groundwater of a substance that causes a site to be defined as a *contaminated site* according to the CS Regulation or specified by the Ministry of Environment.

**Contingency plan:** a document that describes an organized, planned, and coordinated course of action to follow in the event of fire, explosion, or discharge of hazardous waste. The aim of plans is to prevent or limit pollution that could threaten human health or the environment.

**Criteria:** in BC, province-wide non-site-specific target values for characteristics of concern (compare guidelines, objectives, and standards).

**Dangerous goods** (as defined by the Hazardous Waste Regulation): dangerous goods as defined and regulated by the Transportation of Dangerous Goods (TDG) Regulations but not including the exemption applicable to manufacturing or processing facilities found in section 1.25 of the TDG Regulations.

**Delisting:** process of showing that hazardous wastes or residues from treatment of hazardous wastes do not pose any significant risk to human health or the environment process and so do not need to be regulated as hazardous waste.

**Demonstration trial:** test or series of tests carried out during the approval process for a treatment process or facility. Among other things, a demonstration trial must show the effectiveness of a process or facility under any *worst-case* conditions that may be encountered, as well as identify appropriate operating conditions.

**Dioxin TEQ:** dioxin toxicity equivalent. A single number that allows the toxicity of mixtures containing dioxins and furans to be compared.

**Director:** a person employed by the government and designated in writing by the Minister of Environment as a director of waste management or as an acting, deputy, or assistant director of waste management.

**Disposal:** the introduction of waste into the environment through any discharge, deposit, emission, or release to any land, water, or air by means of facilities that are designed, constructed, and operated so as to minimize the effect on the environment.

**Environment:** the air, land, water, and other external conditions or influences in which humans, animals, and plants live or develop.

**Ex Situ:** relating to soil, sediment, surface water or groundwater that has been physically removed or excavated from where it originated.

**Facility:** any works that are designed to or do handle, store, treat, destroy, or dispose of hazardous waste. Includes recycle facilities, storage facilities, treatment facilities, incinerators, thermal treatment facilities, mobile facilities, secure landfills, piles, surface impoundments, land treatment facilities, and secure buildings for disposal.

**Final cover:** the cover material that is applied upon closure of a landfill and the surface of which is permanently exposed.

**Free liquid:** any quantity of a liquid that is separated from a solid when subjected to the *Free Liquid Test Procedure* specified in Part 3 of Schedule 4 of the Hazardous Waste Regulation.

**Friable asbestos:** a material containing asbestos fibres or dust that can be crumbled easily. Friable asbestos releases fibres with minimal mechanical disturbance.

**Generator:** the person who, by nature of ownership, management, or control, is responsible for causing or allowing the creation of hazardous waste.

**Generator registration number:** see Provincial identification number.

**Guidelines:** non–site-specific guide values for assessing characteristics of concern (compare criteria, objectives, and standards).

**Halogenated:** covalently bonded with one or more of the following elements: bromine, chlorine, fluorine, iodine.

**Hazardous waste:** any waste that meets the definition of hazardous waste in section 1 of the Hazardous Waste Regulation.

**Heavy metal:** no specific definition. Often refers to toxic elements such as antimony, arsenic, beryllium, cadmium, chromium, copper, lead, manganese, mercury, nickel, selenium, silver, thallium, vanadium, or zinc.

**Impervious:** having a permeability not greater than  $1 \times 10^{-7}$  cm/s when tested using a head of 0.305 m of water.

**Indoor:** enclosed and protected from precipitation and wind as in a building, but not including a shipping container used for passive storage.

**Labpack:** a drum with a maximum capacity of 454 L that is used for storing or transporting smaller containers of hazardous waste and that includes one or more inner linings that contain absorbent or cushioned packaging.

**LC<sub>50</sub>:** concentration of a substance in air or water that kills 50% of test organisms within a specified time under standardized conditions.

**LD<sub>50</sub>:** dosage of a substance that kills 50% of a sample population of test animals as determined from exposure to the substance, by any route other than inhalation, within a specified time under standardized conditions.

**Leachable toxic waste:** a liquid on its own or a solid that, when exposed to acidified water according to the procedure in US EPA *Method 1311*, produces a liquid that has levels of contaminants greater than specified in the Hazardous Waste (HW) Regulation.

**Leachate:** liquid containing contaminants, generated by percolation of water through materials.

**Manage:** to handle, transport, store, treat, destroy, or dispose of hazardous waste.

**Manager:** a person appointed under the *Public Service Act* as a manager in the Ministry of Environment and designated in writing by the minister as a regional manager or as an acting, assistant, or deputy regional manager.

**Manifest:** a form for documenting and tracking the movement of hazardous waste. This document when issued by Environment Canada for shipments of hazardous waste or hazardous recyclable materials across national or provincial boundaries is called a *movement document*.

**Movement document:** see Manifest.

**Notification:** for shipments of hazardous waste, the process of advising government agencies in advance of the shipment of hazardous waste. The shipment may be leaving, going to, or passing through the notified jurisdiction. For applications for permits or for changes in requirements, the process of advising the public of these applications.

**Objectives:** site-specific target values for characteristics of concern (compare criteria, guidelines, and standards).

**Oil:** see Waste oil.

**On site media:** contaminated soil, sediment, surface water or groundwater that would be hazardous waste only because it meets any of the criteria for definition as *hazardous waste* (top box of Figure 2 on page 21) but which remains at the site where it originated.

**Operator:** the person responsible for the overall operation of a facility.

**Passive storage:** storage where the only operations performed are placement, retrieval, and inspection of hazardous waste.

**PCB:** polychlorinated biphenyls. Substances having the molecular formula  $C_{12}H_{10-n}Cl_n$ , where n can be any number from 3 to 10 inclusive. Also known as chlorinated biphenyls or chlorobiphenyls.

**PCB equipment:** any manufactured item that contains or is contaminated with a PCB liquid or PCB solid. While items of PCB equipment are often electrical components such as transformers or capacitors, the definition includes other items such as contaminated drums and containers. An item of equipment need only be contaminated with liquid or solid containing more than 50 parts per million by weight of PCB for the whole item to be considered PCB equipment.

**PCB liquid:** any liquid containing more than 50 ppm by weight of PCB.

**PCB solid:** any material or substance other than a liquid containing more than 50 ppm by weight of PCB. Absorbents or soils contaminated with PCB are typical examples.

**PCB wastes:** PCB liquids, PCB solids, and PCB equipment are grouped together, and all except PCB equipment that is actually in service are defined as PCB wastes. Any PCB equipment becomes PCB waste as soon as it is removed from service, even if the intent is to treat, recycle, or reuse the equipment.

**Person:** an individual, partnership, or incorporated group having both legal rights and responsibilities.

**Permeability:** the property of soil or rock that allows water to pass through it.

**pH:** approximately the negative logarithm of the hydrogen ion concentration in a water solution. Water solutions with pH 7 at 25 °C are neutral; solutions with a pH less than 7 are acidic; and solutions with a pH more than 7 are basic.

**Pile:** see Waste pile.

**Polycyclic aromatic hydrocarbon TEQ, or PAH TEQ:** polycyclic aromatic hydrocarbon toxicity equivalent. A number that allows the toxicity of mixtures containing PAH to be compared. PAH is also known as polynuclear aromatic hydrocarbon.

**Principal organic hazardous constituents, or POHC:** one or more organic components of a hazardous waste that are designated by a director, usually for the purpose of testing the effectiveness of incinerators or thermal treatment systems.

**Product of incomplete combustion, or PIC:** a carbon-containing compound, other than carbon dioxide, present in the exhaust stream of a thermal treatment facility.

**Protocol:** a defined procedure for carrying out a test that must be followed strictly to produce valid test results.

**Provincial identification number:** a unique number issued by a director to a person. In the case of:

- A generator it is the generator registration number or BCG number
- A carrier it is the transport licence number, and
- A receiver it is the registered site number

**Pyrolysis:** a thermal treatment process for decomposing organic wastes in an oxygen-deficient atmosphere at high temperatures.

**Recharge area:** any land within which water enters an aquifer.

**Registered site number:** see Provincial identification number.

**Retention time:** the time for which hazardous waste is subjected to the combustion zone temperature in an incinerator.

**Seasonally high water table:** the highest level of rise of the free surface of water below the ground surface at any time during the year.

**Solidification:** a treatment process for stabilizing waste within a solid with high structural integrity.

**Standards:** legally enforceable limit values for characteristics of concern (compare criteria, guidelines, and objectives).

**Statistically significant:** probably true; not likely the result of chance. As applied to groundwater monitoring around piles, surface impoundments, land treatment facilities, secure landfills, and secure buildings, establishing a link between the stored wastes and the contaminants in the groundwater.

**Storage:** as applied to hazardous waste, any situation where it is intended the waste will be moved for treatment or disposal.

**Surrogate:** a substitute. As applied to testing of treatment facilities, a less hazardous material for initial testing of these processes or facilities, or a material used to allow measurement of treatment efficiency that would not otherwise be possible.

**Swale:** a low, wet piece of land.

**TDG Act or Regulations:** *Transportation of Dangerous Goods Act or Regulations* (Canada).

**Thermal treatment:** the treatment of hazardous waste in a device that uses elevated temperatures.

**Transport licence number:** see Provincial identification number.

**Treatment:** the use of a process or operation to change physical, chemical, or biological properties of a waste. The usual reason for treatment is to make hazardous waste less hazardous or to reduce its volume. Dilution is not considered treatment under the Hazardous Waste Regulation.

**UN number or United Nations number:** an international identifying number assigned to dangerous goods by the United Nations.

**Unconfined aquifer:** an aquifer that extends downward from the surface with no low-permeability material above it.

**Underground injection:** the emplacement of fluids underground through a bored, drilled, driven, or dug well.

**Waste:** air contaminants, litter, effluent, refuse, biomedical waste, hazardous wastes, and any other substance designated by the Lieutenant Governor-in-Council as waste whether or not it has any commercial value or is capable of being used for a useful purpose.



**Waste oil:** automotive lubricating oil, cutting oil, fuel oil, gear oil, hydraulic oil, any other refined petroleum-based oil, synthetic oil, or materials containing 3% or more of such oils, where the oils through use, storage, or handling have become unsuitable for their original purpose due to the presence of impurities or loss or original properties.

**Waste pile:** any non-containerized accumulation of solid, non-flowing hazardous waste that is being stored or treated.

**Wetland:** any land such as a tidal flat, marsh, swamp, bog, or fen that is frequently inundated and for that reason has developed an organic soil and occurs in an area that is lower lying than its surroundings.



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