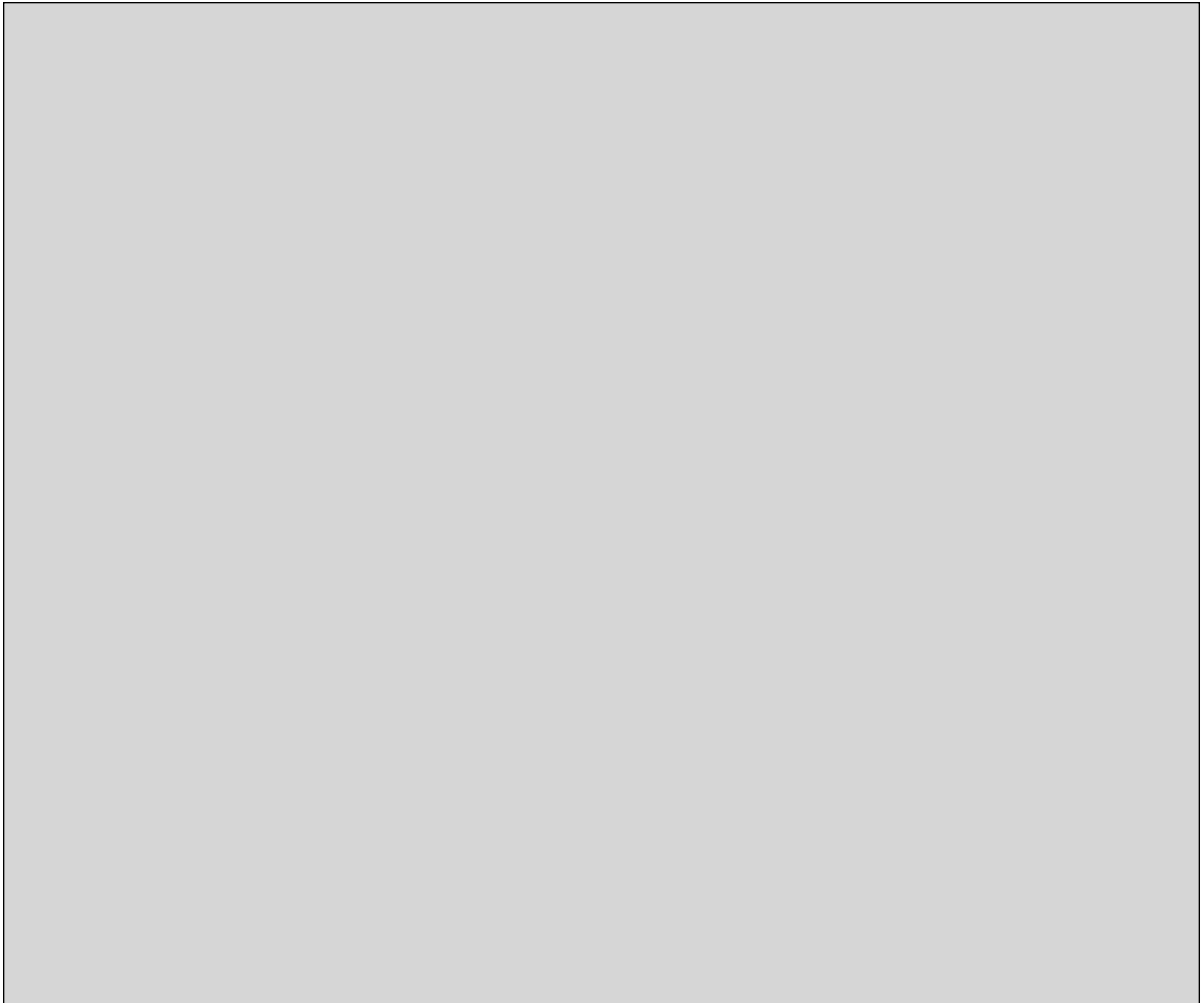


NWMO BACKGROUND PAPERS

7. INSTITUTIONS AND GOVERNANCE

**7-3 THE STATUS OF THE LEGAL AND ADMINISTRATIVE ARRANGEMENTS
FOR HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT (HLRWM)**

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NWMO Background Papers

NWMO has commissioned a series of background papers which present concepts and contextual information about the state of our knowledge on important topics related to the management of radioactive waste. The intent of these background papers is to provide input to defining possible approaches for the long-term management of used nuclear fuel and to contribute to an informed dialogue with the public and other stakeholders. The papers currently available are posted on NWMO's web site. Additional papers may be commissioned.

The topics of the background papers can be classified under the following broad headings:

1. **Guiding Concepts** – describe key concepts which can help guide an informed dialogue with the public and other stakeholders on the topic of radioactive waste management. They include perspectives on risk, security, the precautionary approach, adaptive management, traditional knowledge and sustainable development.
2. **Social and Ethical Dimensions** - provide perspectives on the social and ethical dimensions of radioactive waste management. They include background papers prepared for roundtable discussions.
3. **Health and Safety** – provide information on the status of relevant research, technologies, standards and procedures to reduce radiation and security risk associated with radioactive waste management.
4. **Science and Environment** – provide information on the current status of relevant research on ecosystem processes and environmental management issues. They include descriptions of the current efforts, as well as the status of research into our understanding of the biosphere and geosphere.
5. **Economic Factors** - provide insight into the economic factors and financial requirements for the long-term management of used nuclear fuel.
6. **Technical Methods** - provide general descriptions of the three methods for the long-term management of used nuclear fuel as defined in the NFWA, as well as other possible methods and related system requirements.
7. **Institutions and Governance** - outline the current relevant legal, administrative and institutional requirements that may be applicable to the long-term management of spent nuclear fuel in Canada, including legislation, regulations, guidelines, protocols, directives, policies and procedures of various jurisdictions.

Disclaimer

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BACKGROUND PAPER
ON THE STATUS OF THE LEGAL AND ADMINISTRATIVE
ARRANGEMENTS FOR HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT
IN CANADA

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EXECUTIVE SUMMARY

Evolution of Legal and Administrative Arrangements for High-Level Radioactive Waste Management in Canada

The research sector of the atomic energy industry in Canada was initially operated by the National Research Council of Canada. The Atomic Energy Control Board (AECB) was established in 1946. This federal administrative tribunal was responsible for controlling and supervising the development, application and use of atomic energy in Canada. The AECB also exercised authority over research and development of atomic energy in Canada. Not long after the AECB was established, Atomic Energy of Canada Limited was incorporated as a Crown Corporation to develop peaceful uses of nuclear energy. This responsibility was removed from the AECB's mandate while the focus of the AECB's activities turned towards the regulation of employee health and safety and defining licensing provisions for nuclear facilities.

The Minister of Natural Resources released Canada's *Radioactive Policy Framework* in 1996, which addressed and defined all classes of radioactive wastes. Canada's principles for the management of radioactive waste as established by the 1996 policy were reiterated and built upon in the 1998 *Government of Canada Response to Recommendations of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel*. The contents of the 1998 response have since been implemented through the *Nuclear Fuel Waste Act* and the Nuclear Waste Management Organization.

The risks associated with nuclear substances, including national security, and the health and safety of persons and the environment are presently regulated by the Canadian Nuclear Safety Commission (CNSC). The CNSC is also responsible for disseminating information to the public regarding its own activities and the effects of Canada's nuclear energy activities on the environment and on the health and safety of persons.

Constitutional Authority Over the Management of High-Level Radioactive Waste in Canada

A recent Supreme Court of Canada decision concluded that the federal government has legislative authority over the development and control of nuclear energy in Canada due to the constitutionally valid declaration that was then included in the *Atomic Energy Control Act*. Similar declarations are now included in the *Nuclear Energy Act* and the *Nuclear Safety and Control Act*. These declarations establish that works and undertakings for the production, use and application of nuclear energy, research or investigation with respect to nuclear energy and the production, refining or treatment of nuclear substances are for the general advantage of Canada and therefore fall within federal jurisdiction.

The wording of these declarations may be seen to be non-exhaustive. Accordingly, some aspects of nuclear waste management may also be regulated by provincial and territorial governments.

Extending jurisdiction to provincial and territorial governments also creates the potential for the involvement of the municipal governments, as matters within provincial jurisdiction that are of local concern are often conferred onto municipalities. In fact, the Supreme Court of Canada recently affirmed that municipal by-laws may validly address issues that are also addressed in legislation that is adopted by a higher level of government, as long as there is no conflict between the provisions implemented by the different levels of government.

The constitutional authority for the federal government to legislate residual matters not listed in the *Constitution Act, 1867* may also be used to support the conclusion that legislation addressing high-level nuclear waste management falls within federal jurisdiction.

Federal Legislation

Canada's *Nuclear Fuel Waste Act* and the *Nuclear Safety and Control Act* are relevant to the management of high-level radioactive waste. The *Nuclear Fuel Waste Act* provides a framework for a future decision in Canada regarding the long-term management of nuclear fuel waste based on a comprehensive, integrated and economically sound approach. This Act provides for the establishment of the NWMO and describes the duties of the organization: to present the Government of Canada with potential approaches and realistic recommendations for the management of nuclear fuel waste; and to implement the adopted approach.

The *Nuclear Safety and Control Act* prohibits certain activities involved in the management of nuclear substances. The Act also gives the CNSC the authority to issue licences to allow the possession, transfer, import, export, use and abandonment of nuclear substances. The CNSC may also issue licences required for the mining, production, refining, conversion, enrichment, processing, reprocessing, packaging, transportation and management of nuclear substances and decommissioning of facilities. Licensees are bound to comply with the terms and conditions of each licence as they are set by the CNSC. All of the stages involved in the disposal of nuclear substances, including interim and long-term storage and disposal and any transportation between, will require a CNSC licence. Regulations promulgated under the *Nuclear Safety and Control Act* prescribe requirements for occupational health and safety, obligations during the transportation of radioactive materials and security measures for the processing, use and storage of all classes of nuclear material. Information submitted for licence applications includes the proposed measures for the handling, storage, loading and transportation of nuclear substances while certain activities require the licensee to keep prescribed information.

Canadian laws of general application that are relevant to aspects of the management of high-level nuclear waste include the *Canadian Environmental Assessment Act*, and the *Transportation of Dangerous Goods Act, 1992*. An environmental assessment is required prior to the issuance of licences by the CNSC that authorize activities involving nuclear substances. Since all of the aspects involved in the project of managing nuclear waste, including interim and long-term storage and disposal and any transportation between, must be authorized through the issuance of a CNSC licence, each of these aspects must also be considered in the environmental assessment of the project. Certain projects, as defined by the *Comprehensive Studies List Regulations*, are required to be subject to a comprehensive study. The environmental assessment must be

conducted “as soon as practicable in the planning stages and before irrevocable decisions are made”.

While the *Transportation of Dangerous Goods Act, 1992* includes radioactive materials in its listing of dangerous goods, the *Transportation of Dangerous Goods Regulations* exempt radioactive materials from the scope of the Regulations if the radioactive materials meet specified requirements of the *Packaging and Transport of Nuclear Substances Regulations*.

Federal Policies and Guidelines

Regulatory documents issued by both the CNSC, and its predecessor, the AECB, supplement Canada’s legally binding legislation. Although these documents are not legally binding, their purpose is to provide instruction, assistance and information regarding legally binding legislative and regulatory requirements. A CNSC Policy, *Protection of the Environment* is discussed, as well as a CNSC Standard, *Reporting Requirements for Operating Nuclear Power Plants*. Regulatory Guides issued by the CNSC that are also discussed include: (a) *Decommissioning Planning for Licensed Activities*, (b) *Financial Guarantees for the Decommissioning of Licensed Activities*, (c) *Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities*, (d) *Transportation Plans for Category I, II or III Nuclear Material*. Relevant Draft Regulatory Policies are also discussed including *Managing Radioactive Wastes* and *Public Access to Information Held at the CNSC*, both of which have been issued for public consultation. Two notable Regulatory Policy Statements issued by the AECB are also discussed: *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concept Assessment Phase* and *Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes – Long Term Aspects*.

Provincial and Territorial Legislation

A variety of Provinces and Territories have legislation and regulations addressing nuclear substances.

Manitoba has adopted legislation that specifically and exclusively addresses high-level radioactive waste. The *High-Level Radioactive Waste Act* prohibits the storage of high-level radioactive waste that was produced outside of Manitoba. It is also expressly prohibited to establish facilities for the disposal of high-level radioactive wastes within the province, regardless of the jurisdiction of the waste’s origin.

Almost all Provinces and Territories, including Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, the Northwest Territories, Nunavut, Prince Edward Island and Quebec, include nuclear substances in the scope of legislation and regulations addressing the transportation of dangerous goods. Two notable exceptions are Nova Scotia and Ontario, both of which do not include radioactive materials included in Class 7 of the federal list of dangerous goods in the scope of the provincial legislation and regulations. Saskatchewan also defers to the federal list of dangerous goods in practice although the legislation and regulations

are ambiguous with respect to the adoption of the federal list of dangerous goods provided by the *Transportation of Dangerous Goods Act, 1992*. The jurisdictions that do address nuclear substances also adopt various aspects of the federal *Transportation of Dangerous Goods Regulations* prescribing safety standards, marks and documentation requirements.

Some Provincial jurisdictions also include radioactive waste in the scope of legislation addressing waste management. For example, British Columbia's *Special Waste Management Act*, promulgated under the *Waste Management Act* prohibits the disposal of radioactive wastes in a "secured landfill" or "long-term storage facility," as defined by the Regulation. New Brunswick's *Environmental Impact Assessment Regulation*, promulgated under the *Clean Environment Act*, requires facilities that process radioactive materials to be subject to environmental impact assessments. New Brunswick also includes the addition of radioactive substances to water in the definition of "water pollution" which is generally prohibited by the *Water Quality Regulation* under the *Clean Environment Act*. Nova Scotia's *Dangerous Goods Management Regulations*, promulgated under the *Environmental Act*, note that any amount of radioactive material is characterized as a "dangerous good". These Regulations also define storage requirements, necessary approvals and contingency plans and establish an offence for management of dangerous goods or waste management goods in a manner that may cause an adverse effect unless prior written approval of the Minister or an Administrator has been attained.

Radioactive wastes that are disposed of in accordance with the CNSC or its predecessor, the AECB, are expressly excluded from Ontario's *General Waste Management Regulations*, which are promulgated under the *Environmental Protection Act*, as well as Quebec's *Regulation Respecting Hazardous Materials*, promulgated under the *Environmental Quality Act*. This leaves radioactive wastes that are not disposed of in accordance with requirements of the CNSC or the AECB subject to the regulatory requirements of these provinces.

Waste management legislation in other jurisdictions, including Manitoba, is broadly worded and open-ended and therefore may be interpreted to include nuclear waste.

Saskatchewan also addresses radioactive substances in the context of occupational health and safety through the *Radiation Health and Safety Act*, which regulates limits of exposure to radiation and requires permits for related activities.

International Treaties and Conventions

Canada has ratified a number of international treaties and conventions that address the management of radioactive waste and nuclear substances. Those that have come into force since Canada's ratification include the *Joint Convention on the Safety of Spent-Fuel Management and on the Safety of Radioactive Waste Management*, *The Convention on the Physical Protection of Nuclear Material*, the *Convention on Nuclear Safety* and the *Treaty on the Non-Proliferation of Nuclear Weapons*. Canada has also ratified the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* and has acceded to the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* yet

at the time of writing, only the Convention had entered into force. Canada is also a non-consultative party to *The Antarctic Treaty*.

The terms of the treaties and conventions that have entered into force are enforceable against their state parties but it is only the Canadian government that may be held accountable for the implementation of these terms. Accordingly, it is the responsibility of the Canadian government to implement the terms and conditions of such international instruments into Canada's domestic legal regime. Only those international obligations that are incorporated into Canada's domestic law are legally binding upon individuals, corporations and organizations that are subject to Canadian law.

For example, one of the stated purposes of the *Nuclear Safety and Control Act* is the implementation of international measures that Canada has agreed to that address the development, production and use of nuclear energy. Accordingly, many of the Regulations promulgated under the *Nuclear Safety and Control Act* address issues that are the subject of international treaties and conventions. For example, the *Nuclear Non-Proliferation Import and Export Control Regulations* promulgated under the *Nuclear Safety and Control Act* address issues included in *The Convention on the Physical Protection of Nuclear Material*. A series of regulations promulgated under the *Nuclear Safety and Control Act* address issues included in the scope of the *Treaty on the Non-Proliferation of Nuclear Weapons* including the *Class I Nuclear Facilities Regulations*, the *General Nuclear Safety and Control Regulations*, and the *Nuclear Non-Proliferation Import and Export Control Regulations*.

Comparative Law

Canada is not alone in the development of an approach to the management of high-level nuclear waste. The regulatory frameworks implemented in other countries that are considering high-level nuclear waste disposal options provide an international context for Canada's undertaking as well as insight into alternative ways and means of proceeding.

INTRODUCTION – THE SCOPE OF THIS BACKGROUND PAPER

This background paper reviews federal and provincial laws, regulations, policies and guidelines relevant to high-level radioactive waste management in Canada.

For the purposes of this paper, “high-level radioactive waste” is defined as the spent fuel that results from generating electricity from Canadian nuclear reactors. This definition is adopted from Natural Resources Canada’s definition of “nuclear fuel waste” in the *Radioactive Policy Framework* issued in 1996.

Following the generation of such waste, steps involved in its management include interim storage, possibly transportation, long-term storage or disposal, and ongoing monitoring and record keeping. There may also be a possibility for recovering the waste for reuse and recycling. Activities undertaken within each of these steps must occur within the legal context, which is described in this paper.

This paper also encompasses Canada’s international treaty obligations as well as the legal and administrative arrangements for high-level nuclear waste management of several other jurisdictions. This paper concludes with certain observations concerning the Canadian legal regime.

Part I discusses the evolution of Canada’s legal and administrative arrangements for high-level nuclear waste management by tracing the history of the Atomic Energy Control Board to its successor, the Canadian Nuclear Safety Commission.

Part II considers the jurisdiction of the various levels of governments in Canada with respect to the management of nuclear waste.

Part III reviews legislation and regulations established under Canada’s federal jurisdiction over works related to nuclear energy. This review includes various pieces of legislation that specifically address nuclear substances as well as relevant federal laws of general application.

Part IV describes the regulatory policies, guidelines and standards of the Canadian Nuclear Safety Commission and its predecessor, the Atomic Energy Control Board. While these pronouncements are not legally binding, they are relevant to the exercise of regulatory discretion as it may be applied to the management of nuclear waste.

Part V examines provincial and territorial legislative provisions that include the management of nuclear waste within their scope.

Part VI discusses the scope of various international instruments addressing the management of nuclear substances. The status of Canada’s commitment with respect to each of these international instruments is also noted.

Part VII highlights notable activities in other jurisdictions around the globe in order to provide further context to Canada’s initiative to identify an approach for the management of nuclear waste.

PART I – THE EVOLUTION OF LEGAL AND ADMINISTRATIVE ARRANGEMENTS FOR HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT IN CANADA

Today’s legal and administrative arrangements applicable to high-level radioactive waste management have evolved since 1946 when the Atomic Energy Control Board (AECB) was established. The creation of the AECB and the introduction of a governmental policy framework for all classes of radioactive wastes illustrate the historical development of legal and administrative arrangements for high-level radioactive waste management in Canada. These developments have led to the current legal and administrative arrangements, which are overseen by the Canadian Nuclear Safety Commission (CNSC).

The History of Canada’s Legal and Administrative Arrangements

(a) Establishment of the Atomic Energy Control Board

In 1946 Canada established the AECB through the *Atomic Energy Control Act*.¹ At that time, the research sector of Canada’s atomic energy industry was being operated by the National Research Council of Canada.

The preamble of the *Atomic Energy Control Act* explained that its purpose was to make provision for the control and supervision of the development, application and use of atomic energy, and to enable Canada to participate effectively in future measures of international control of atomic energy.

The AECB was established to fulfil the stated purpose of the Act and was also charged with the duty to advise the Federal Cabinet Committee on Scientific and Industrial Research on all matters relating to atomic energy that may affect the public interest. The AECB was initially granted an extensive list of powers and was conferred authority over the following: research and investigations with respect to atomic energy; the use of atomic energy; the purchase, lease, requisition or expropriation of atomic substances, mine deposits or claims and patent rights over atomic energy and related works or property by the federal government; dissemination of information to the public; establishing scholarships and grants in aid of research and investigation; and providing training for research and investigation activities.

The Board could make a variety of regulations, including, for example: to encourage and facilitate research; to develop, control, supervise and license the production, application and use of atomic energy; to address mining and prospecting for atomic substances; and to address the production, import, export, transportation, refining, possession, ownership, use or sale of atomic substances. When it was first established, the AECB therefore exercised jurisdiction over three aspects of the atomic energy industry: regulation, mining and research.

¹ S.C. 1946, c. 37.

Atomic Energy of Canada Limited (AECL) was established in 1952 as a Crown Corporation only six years after the adoption of the *Atomic Energy Control Act* and the establishment of the AECB. AECL's mandate was to develop peaceful uses of nuclear energy, effectively resulting in an overlap of jurisdiction with the AECB.

This resulted in a change to the powers of the AECB, which was reflected in legislation in 1954 through amendment of the *Atomic Energy Control Act*.² The AECB retained its regulation making abilities as well as its authority over the dissemination of information to the public, the establishment of scholarships and grants in aid of research and investigation, and provision of training for such research and investigation activities. The authority over research and investigations with respect to atomic energy; the use of atomic energy; and the purchase, lease, requisition or expropriation of atomic substances, mine deposits or claims and patent rights over atomic energy and related works or property by the federal government and other powers of the AECB were reallocated to the Chairman of the Federal Cabinet Committee on Scientific and Industrial Research or a designated member of the Federal Cabinet.

All phases of developing nuclear facilities and managing radioactive substances remained subject to the *Atomic Energy Control Act* and its Regulations and were therefore regulated by the AECB. Activities of the AECB were focused on employee health and safety in 1960 and a regulation was adopted to set maximum levels of radioactive exposure for workers.³ By 1974, the AECB's attention turned to details of licensing provisions for nuclear facilities, equipment and materials as well as defining the powers of inspectors. Public participation in the AECB's decision-making process was introduced in the mid-1980s.

(b) Adoption of the Radioactive Policy Framework for All Classes of Radioactive Wastes

It was noted in 1995 by the Auditor General that Canada had only one formal policy on radioactive wastes, and it applied only to low-level wastes. The Auditor General suggested that a policy should be adopted that addresses all classes of radioactive wastes. The Minister of Natural Resources released Canada's *Radioactive Policy Framework*⁴ in 1996.

The *Radioactive Policy Framework* did address all classes of radioactive wastes, including high-level nuclear waste, which was referred to as "nuclear fuel waste". This type of nuclear waste was described as "the spent fuel that results from generating electricity from Canadian nuclear

² S.C. 1953-54, c. 47.

³ *Atomic Energy Control Regulations*, S.O.R./60-119, repealed and replaced by S.O.R./74-334, reproduced at C.R.C., c. 365 (1978).

⁴ Natural Resources Canada, *Radioactive Policy Framework* (1996) as duplicated for the International Conference on Deep Geological Disposal of Radioactive Waste, *Proceedings of the 1996 International Conference on Deep Geological Disposal of Radioactive Waste, September 16-19, 1996* (Toronto: Canadian Nuclear Society, 1996) 1-41.

reactors” and was distinguished from low-level radioactive waste, which was described as “all other waste, including intermediate level and decommissioning waste, from the application of nuclear energy”. These types of radioactive waste were also distinguished from uranium mine and mill tailings.

The *Radioactive Policy Framework* was released at a time when the disposal of high-level radioactive waste was under review in Canada with the goal of identifying and implementing a method or system for disposal. The Policy Framework was meant to lay the ground rules and define the role of government and waste producers for the approach to the disposal of radioactive wastes in Canada that was anticipated to be identified by the review.⁵ The following principles were defined for radioactive waste disposal in Canada:

1. The federal government will ensure that radioactive waste disposal is carried out in a safe, environmentally sound, comprehensive, cost-effective, and integrated manner.
2. The federal government has the responsibility to develop policy, to regulate, and to oversee producers and owners to ensure they comply with legal requirements, and meet their funding and operational responsibilities in accordance with approved waste disposal plans.
3. The waste producers and owners are responsible, in accordance with the principle of “polluter pays”, for the funding, organization, management and operation of disposal and other facilities required for their wastes, recognizing that arrangements may be different for nuclear fuel waste, low-level radioactive waste and uranium mine and mill tailings.⁶

It was also noted that only one nuclear fuel waste disposal facility would be required at any one time in Canada. Those using the disposal facility could potentially be from a broad range of regions in Canada thus creating the need to make the facility accessible and affordable.

The three principles defined in Canada’s policy framework for radioactive waste listed above were more recently reiterated by the Canada’s federal government in December 1998 in the *Government of Canada Response to Recommendations of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel*. Building upon the 1996 *Radioactive Policy Framework*, this document also provided direction for the development of the Government of Canada’s nuclear fuel waste management policy including the establishment of a fund to finance long-term management, including disposal, of nuclear fuel waste. The producers and owners of nuclear fuel waste were identified as contributors to the fund through an arm’s length waste management organization that would report to the federal government. Implementing a method for government review and approval was also suggested. These suggestions have since been implemented through the *Nuclear Fuel Waste Act* and the subsequent establishment of the Nuclear Waste Management Organization (NWMO), established by owners of used nuclear fuel.

⁵ *Ibid.* at 1-51.

⁶ *Ibid.* at 1-49.

Canada's Current Legal and Administrative Arrangements

In May of 2000, when the *Nuclear Safety and Control Act*⁷ came into force, the *Atomic Energy Control Act* was amended and renamed the *Nuclear Energy Act*.⁸ Authority to regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances and prescribed equipment and information was conferred upon the CNSC through the *Nuclear Safety and Control Act*.

The CNSC was established to fulfil the purpose of the *Nuclear Safety and Control Act*, which recognizes the risks associated with nuclear substances and activities and seeks to limit the risks imposed upon national security, the health and safety of persons and the environment to a reasonable level. The role of the CNSC is reflected in its mission statement, which is “to regulate the use of nuclear energy and materials to protect health, safety, security and the environment and to respect Canada’s international commitments on the peaceful use of nuclear energy”.⁹ The CNSC is also responsible for the dissemination of information to the public regarding its own activities and the effects of Canada’s nuclear energy activities on the environment and on the health and safety of persons.

Summary of the Evolution of Legal and Administrative Arrangements for High-Level Radioactive Waste Management in Canada

The research sector of the atomic energy industry in Canada was initially operated by the National Research Council of Canada. The AECB was established in 1946. This federal administrative tribunal was responsible for controlling and supervising the development, application and use of atomic energy in Canada. The AECB also exercised authority over research and development of atomic energy in Canada. Not long after the AECB was established, Atomic Energy of Canada Limited was incorporated as a Crown Corporation to develop peaceful uses of nuclear energy. This responsibility was removed from the AECB’s mandate while the focus of the AECB’s activities turned towards the regulation of employee health and safety and defining licensing provisions for nuclear facilities.

The Minister of Natural Resources released Canada’s *Radioactive Policy Framework* in 1996, which addressed and defined all classes of radioactive wastes. Canada’s principles for the management of radioactive waste as established by the 1996 policy were reiterated and built upon in the 1998 *Government of Canada Response to Recommendations of the Nuclear Fuel Waste Management and Disposal Concept Environmental Assessment Panel*. The contents of the 1998 response have since been implemented through the *Nuclear Fuel Waste Act* and the NWMO.

⁷ S.C. 1997, c. 9.

⁸ R.S.C. 1985, c. A-16.

⁹ Canadian Nuclear Safety Commission, *Mission*, online: <<http://www.nuclearsafety.ca/eng/whois/mission/>> (last modified: 26 June 2003).

The risks associated with nuclear substances, including national security, and the health and safety of persons and the environment are regulated by the Canadian Nuclear Safety Commission. The CNSC is also responsible for disseminating information to the public regarding its own activities and the effects of Canada's nuclear energy activities on the environment and on the health and safety of persons.

PART II – CONSTITUTIONAL AUTHORITY OVER THE MANAGEMENT OF HIGH-LEVEL RADIOACTIVE WASTE IN CANADA

Canada's government is organized as a federal system with a central and regional authorities: the federal and provincial and territorial governments. Powers of government are distributed between these levels of government by the *Constitution Act, 1867*.¹⁰ Disputes arising from the governmental exercise of purported jurisdiction have been the subject of judicial consideration. The following discussion reviews the division of powers in relation to high-level radioactive waste as defined by the *Constitution Act, 1867*, implemented by legislation, and interpreted by the courts.

Canada's Constitutional Division of Powers

Section 91 of the *Constitution Act, 1867* provides a list of matters that fall within the jurisdiction of the federal government. Subsection (29) notes that the Parliament of Canada has authority over matters that are expressly exempted from the description of a matter that falls within provincial jurisdiction as defined by s. 92 of the Act. Section 92(10)(c) gives the Parliament of Canada the opportunity to declare local works to be for the general advantage of Canada and exempts such works from provincial jurisdiction. The effect of such a declaration is the same as if the work was expressly listed as a head of federal authority within s. 91.

Local works subject to a declaration made by the Parliament of Canada that they are for the general advantage of Canada therefore fall within federal jurisdiction. Section 18 of the *Atomic Energy Control Act* was an example of such a declaration:

18. All works and undertakings whether heretofore constructed or hereafter to be constructed,-

- (a) for the production, use and application of atomic energy,
- (b) for research or investigation with respect to atomic energy, and
- (c) for the production, refining or treatment of prescribed substances,

are and each of them is declared to be works or a work for the general advantage of Canada.

This section of the *Atomic Energy Control Act* therefore created federal jurisdiction over nuclear energy and "prescribed substances".

¹⁰ (U.K.), 30 & 31 Vict., c. 3, reprinted in R.S.C. 1985, App. II, No. 5.

Prescribed substances were defined as follows:

2(h) “prescribed substances” means uranium, thorium, plutonium, neptunium, deuterium, their respective derivatives and compounds and any other substances which the Board may by regulation made under this Act designate as being capable of releasing atomic energy, or as being requisite for the production, use or application of atomic energy.

The wording of this declaration was amended in May of 2000 when the *Nuclear Energy Act* came into force. It now states:

18. All works and undertakings constructed

- (a) for the production, use and application of nuclear energy,
- (b) for research or investigation with respect to nuclear energy, and
- (c) for the production, refining or treatment of nuclear substances,

are, and each of them is declared to be, works or a work for the general advantage of Canada.

As will be noted from the above, the references to atomic energy and prescribed substances were changed to refer instead to nuclear energy and nuclear substances respectively.

The definition of “nuclear substance” is more detailed than the previous definition of “prescribed substance”. It includes the following:

- (a) deuterium, thorium, uranium or an element with an atomic number greater than 92;
- (b) a derivative or compound of deuterium, thorium, uranium or of an element with an atomic number greater than 92;
- (c) a radioactive nuclide;
- (d) a substance that is prescribed as being capable of releasing nuclear energy or as being required for the production or use of nuclear energy;
- (e) a radioactive by-product of the development, production or use of nuclear energy; and
- (f) a radioactive substance or radioactive thing that was used for the development or production, or in connection with the use, of nuclear energy.¹¹

¹¹ *Nuclear Safety and Control Act*, S.C. 1997, c. 9, s. 2 “nuclear substance”.

Accordingly, a work or undertaking constructed for the production, refining and treatment of nuclear substances which are nuclear waste, fall within federal jurisdiction. A similar declaration is also included in the *Nuclear Safety and Control Act*.¹²

Section 91 of the *Constitution Act* also allocates residual matters, those that are not listed in either the lists of authority for the Parliament of Canada or Provincial Legislation, to the Parliament of Canada. The federal government may therefore make laws for the peace, order and good government (“POGG”) of Canada for all matters explicitly listed as falling within federal jurisdiction and for all matters that are not included in the exclusive listing of powers of Provincial Legislatures.

As nuclear energy had not yet been discovered when the Constitution was drafted it was not included in either the federal or the provincial list of powers. Since nuclear energy is not mentioned in either list of authority, it is a residual matter and is also therefore subject to federal jurisdiction under the Parliament of Canada’s POGG jurisdiction.

Judicial Interpretation

The Supreme Court of Canada confirmed that the forgoing provisions do establish federal authority over nuclear energy works in the decision rendered in *Ontario Hydro v. Ontario (Labour Relations Board)*¹³ while considering whether the scope of the federal government’s jurisdiction over nuclear energy included labour relations issues relating to employees of a nuclear facility. The Court unanimously concluded that federal government’s declaration of jurisdiction over nuclear energy works in the *Atomic Energy Control Act* was constitutionally valid. Despite this unanimous conclusion, the contents of the separate decisions written by the presiding members of the Court illustrate a limitation regarding the scope of this authority.

While the majority of the Court concluded that labour relations issues surrounding employees directly involved in nuclear processes are within federal jurisdiction, in a strong dissent, three of the seven Supreme Court judges concluded that the scope of the federal government’s declaration of jurisdiction over nuclear works did not extend to control labour relations at nuclear facilities. These judges referred to the traditional approach to interpretation of the constitutional division of powers between the Parliament of Canada and Provincial Legislatures. The dissenting justices noted that the Parliament of Canada’s declaratory power is not absolute, as it is limited in order to respect the powers of Provincial Legislatures. It was also noted that the federal government’s POGG jurisdiction is restricted to aspects of the matter in question that raise a national concern.

¹² S.C. 1997, c. 9, s. 71 states: “Any work or undertaking constructed for the development, production or use of nuclear energy or for the mining, production, refinement, conversion, enrichment, processing, reprocessing, possession or use of a nuclear substance or for the production, possession or use of prescribed equipment or prescribed information is declared to be a work or undertaking for the general advantage of Canada.”

¹³ [1993] 3 S.C.R. 327.

Although his final disposition agreed with the majority conclusion, the decision written by Lamer, the Chief Justice of the Court, agreed with the dissent's description of the limitations on these federal powers.

This Supreme Court of Canada decision was later applied by the Ontario Court (General Division) when the validity of the federally enacted *Nuclear Liability Act* was challenged in *Energy Probe v. Canada (Attorney General)*.¹⁴ The constitutionality of various provisions within the *Nuclear Liability Act* was challenged based on the argument that the protection of nuclear operators and suppliers from civil liability was related to property and civil rights in the province and therefore fell within provincial jurisdiction.

In the *Energy Probe* decision, the Court held that the *Nuclear Liability Act* was constitutionally valid as it was a proper exercise of federal jurisdiction. It concluded that “the chief purpose of the *Nuclear Liability Act* [was] to facilitate the development of nuclear energy for peaceful purposes.”¹⁵ The Act was enacted in response to concerns regarding the potential liability among nuclear suppliers and operators and the lack of availability of adequate insurance coverage.

In so concluding, the Court in *Energy Probe* referred to both the federal POGG jurisdiction and the *Atomic Energy Control Act* declaration discussed above as sources of federal jurisdiction over the development, production, application and use of atomic energy. The *Nuclear Liability Act* was described as “integral to the federal government’s competence to develop atomic energy for peaceful purposes”¹⁶ which had been clearly characterized by the Supreme Court of Canada as a matter of national concern in the *Ontario Hydro* decision. The action was therefore dismissed.

Authority for Provincial Government Involvement

The non-exhaustive declarations in the *Nuclear Energy Act* and the *Nuclear Safety and Control Act* may provide an opportunity for Provincial Legislatures to legislate with respect to aspects of nuclear waste management. There may also be limitations on the application of the federal POGG jurisdiction over the management of nuclear waste. There may therefore be some scope for the exercise of provincial jurisdiction over aspects of nuclear waste management.

¹⁴ (1994), 17 O.R. (3d) 717 (Ont. Ct. (Gen. Div.)).

¹⁵ *Ibid.* at p. 724.

¹⁶ *Ibid.* at p. 727.

Authority for Municipal Government Involvement

It is also important to recognize the potential for involvement of the municipal government in this field. Matters within provincial jurisdiction may be conferred onto municipalities, which are, in essence, provincially created bodies with limited jurisdiction. Issues that fall within provincial jurisdiction that are matters of local concern are often conferred upon municipal authorities as they are closest to the citizens affected.

While municipalities may only exercise the powers that are expressly conferred onto them by statute, such authority is often conferred through an open-ended omnibus or general welfare provision. These open-ended grants of authority are flexible and take into consideration the fact that the powers that will be required to legislate concerning local issues that arise cannot always be foreseen. The challenge of a municipal by-law enacted under an open-ended omnibus provision therefore requires the court to assess the scope of the authority granted to the municipality and determine whether the by-law in question falls within that scope. In such a situation, in order for the by-law to be declared invalid, it must be clearly demonstrated that the exercise of municipal authority was beyond its jurisdiction.

The Supreme Court of Canada recently affirmed that municipal by-laws may validly address issues that are also addressed in legislation adopted by a higher level of government in *114957 Canada Ltee. (Spraytech, Societe d'arrosage) v. Hudson (Town)*.¹⁷ The Court upheld the Town of Hudson's by-law that restricted the use of pesticides within the town's boundaries, which was enacted by the town using the powers conferred through an open-ended omnibus provision. The Court concluded that the by-law was within the town's jurisdiction as its purpose was to minimize the use of allegedly harmful pesticides in order to protect the health of the town's inhabitants, which was within the scope of the broad omnibus provision allowing by-laws for securing health within the municipality.

The by-law was upheld despite the existence of legislation promulgated by both federal and provincial authorities concerning toxic and hazardous substances, since there was no operational conflict between the municipal by-law and the laws of the higher levels of government. In order for this scheme of multiple-level legislation to be successful, conflict between the provisions at different levels is not allowed yet the lower level of government may impose higher standards. This is based on the understanding that "a true and outright conflict can only be said to arise when one enactment compels what the other forbids."¹⁸

This recent finding of the Supreme Court of Canada suggests that, depending on the authority that is conferred from the provincial government to municipalities, municipalities may be capable of imposing standards for the management of nuclear waste within their boundaries that are stricter than existing federal and provincial legislation.

¹⁷ [2001] 2 S.C.R. 241.

¹⁸ *Ibid.* at para. 38 quoting the decision of the British Columbia Court of Appeal in *British Columbia Lottery Corp. v. City of Vancouver* (1999), 169 D.L.R. (4th) 141 at 148.

Summary of Constitutional Authority Over the Management of High-Level Radioactive Waste in Canada

A recent Supreme Court of Canada decision concluded that the federal government has legislative authority over the development and control of nuclear energy in Canada due to the constitutionally valid declaration that was then included in the *Atomic Energy Control Act*. Similar declarations are now included in the *Nuclear Energy Act* and the *Nuclear Safety and Control Act*. These declarations establish that works and undertakings for the production, use and application of nuclear energy, research or investigation with respect to nuclear energy and the production, refining or treatment of nuclear substances are for the general advantage of Canada and therefore fall within federal jurisdiction.

The wording of these declarations may be seen to be non-exhaustive. Accordingly, some aspects of nuclear waste management may also be regulated by provincial and territorial governments. Extending jurisdiction to provincial and territorial governments also creates the potential for the involvement of the municipal governments, as matters within provincial jurisdiction that are of local concern are often conferred onto municipalities. In fact, the Supreme Court of Canada recently affirmed that municipal by-laws may validly address issues that are also addressed in legislation that is adopted by a higher level of government, as long as there is no conflict between the provisions implemented by the different levels of government.

The constitutional authority for the federal government to legislate residual matters not listed in the *Constitution Act, 1867* may also be used to support the conclusion that legislation addressing high-level nuclear waste management falls within federal jurisdiction.

PART III – FEDERAL LEGISLATION

By exercising the federal jurisdiction over works related to nuclear energy discussed above, Canada's federal government has adopted various pieces of legislation that specifically address nuclear substances. The scope of the *Nuclear Energy Act*, the *Nuclear Liability Act*,¹⁹ the *Nuclear Fuel Waste Act*²⁰ and the *Nuclear Safety and Control Act* as well as any relevant Regulations promulgated under these Acts is discussed below.

Canada also has other pieces of federal legislation, laws of general application, that may apply to aspects of the processes involved in the management of high-level nuclear waste. The scope of the *Canadian Environmental Assessment Act*,²¹ the *Transportation of Dangerous Goods Act, 1992*,²² the *Canadian Environmental Protection Act, 1999*²³ and the *Hazardous Products Act*²⁴ and any relevant Regulations promulgated under these Acts are also discussed below.

Legislation Related to Nuclear Substances

(a) *Nuclear Energy Act*

As noted above, the *Atomic Energy Control Act* has been amended and became the *Nuclear Energy Act* and the AECB has been replaced by the CNSC, which is governed by the *Nuclear Safety and Control Act* (discussed below). Many provisions of the *Atomic Energy Control Act* were therefore incorporated into the *Nuclear Safety and Control Act* and removed from the *Nuclear Energy Act*. In fact, it is the *Nuclear Safety and Control Act* that includes transitional provisions detailing the changes made through the dissolution of the AECB and the creation of its successor, the CNSC.

The powers of the Minister of Natural Resources currently listed in the *Nuclear Energy Act* are the same as those that were allotted to the Chairman of the Federal Cabinet Committee on Scientific and Industrial Research or a designated member of the Federal Cabinet for Canada by the *Atomic Energy Control Act*. Regulations promulgated under the Act also continue to address uranium mine employees' health and safety issues.²⁵

¹⁹ R.S.C. 1985, c. N-28.

²⁰ S.C. 2002, c. 23.

²¹ S.C. 1992, c. 37.

²² S.C. 1992, c. 34.

²³ S.C. 1999, c. 33.

²⁴ R.S.C. 1985, c. H-3.

²⁵ *Uranium Mines (Ontario) Occupational Health and Safety Regulations*, S.O.R./84-435.

As discussed above, the Act's declaration that certain nuclear energy works and undertakings are for the general advantage of Canada is worded as follows:

18. Works and undertakings – All works and undertakings constructed

- (a) for the production, use and application of nuclear energy,
- (b) for research or investigation with respect to nuclear energy, and
- (c) for the production, refining and treatment of nuclear substances,

are, and each of them is declared to be, works or a work for the general advantage of Canada.

The definition of “nuclear substances” provided by the *Nuclear Safety and Control Act* is adopted by the *Nuclear Energy Act*. Works and undertakings for the production, refining and treatment of the following nuclear substances therefore falls within federal jurisdiction:

- (a) deuterium, thorium, uranium or an element with an atomic number greater than 92;
- (b) a derivative or compound of deuterium, thorium, uranium or of an element with an atomic number greater than 92;
- (c) a radioactive nuclide;
- (d) a substance that is prescribed as being capable of releasing nuclear energy or as being required for the production or use of nuclear energy;
- (e) a radioactive by-product of the development, production or use of nuclear energy; and
- (f) a radioactive substance or radioactive thing that was used for the development or production, or in connection with the use, of nuclear energy.

Accordingly, a work or undertaking constructed for the production, refining and treatment of nuclear substances that are nuclear waste, fall within federal jurisdiction.

(b) *Nuclear Liability Act*

The *Nuclear Liability Act* applies to “nuclear installations” which are (a) structures containing nuclear material in such an arrangement that a self-sustaining chain process of nuclear fission can be maintained therein without an additional source of neutrons, including any structure that forms part of the equipment of a ship, aircraft or other means of transport, (b) a factory or other establishment that processes or reprocesses nuclear material, or (c) a place in which nuclear material is stored other than incidentally to the carriage of the material. The application of this

Act to places storing nuclear material suggests that its provisions would apply to facilities used for the long-term management of nuclear fuel waste.

Pursuant to the *Nuclear Liability Act*, the holder of a nuclear installation licence has a duty to prevent injury to health or damage to property from nuclear material at the facility or while it is being transported. This obligation is one of absolute liability, a breach of which results in an obligation to compensate for resulting damages. The injury or damage must simply be proven to be attributable to a breach of the duty imposed on the operator by the Act; it is not required to prove fault or negligence. Liability for compensation arising from the breach of a duty established by the Act, for which the facility operator is exclusively responsible, is limited to seventy-five million dollars.

The Parliament of Canada may also enter into reciprocal agreements with other countries for compensation for damage caused by a nuclear incident in Canada. For example, the *Canadian-U.S. Nuclear Liability Rules*²⁶ make a Canadian operator liable for any injury or damage caused in the US by a Canadian nuclear accident.

(c) *Nuclear Fuel Waste Act*

The *Nuclear Fuel Waste Act* is meant to provide a framework for identifying and implementing a future decision regarding the long-term management (defined to include storage or disposal) of nuclear fuel waste based on a comprehensive, integrated and economically sound approach in Canada.

The *Nuclear Fuel Waste Act* provides for the establishment of the NWMO to conduct a thorough study and present the Government of Canada with potential approaches and realistic recommendations for the management of nuclear fuel waste. The general public and aboriginal peoples will be consulted on each of the proposed approaches and a summary of comments and concerns must accompany the NWMO's final report to the Government of Canada. Each of the studies and reports conducted and considered by the NWMO will also be made available to the public when submitted to the Minister of Natural Resources. The Minister of Natural Resources may pursue further consultations with the general public as is deemed necessary.

The Government of Canada is authorized to select one of the approaches presented by the NWMO for the management of nuclear fuel waste in Canada. The NWMO will then also be responsible for the implementation of the selected approach.

The Act also requires facility operators to establish and contribute to a continuing trust fund intended to finance the implementation Canada's adopted approach to nuclear fuel waste management.

²⁶ C.R.C., c. 1240.

(d) *Nuclear Safety and Control Act*

The stated purpose of the *Nuclear Safety and Control Act* is to limit risks, to a reasonable level, that are imposed upon national security, the health and safety of persons and the environment by the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information. The Act is also meant to implement Canada's international obligations regarding the development, production and use of nuclear energy.

The CNSC has been established to fulfil the purposes of this Act. The CNSC is therefore empowered to regulate the development, production and use of nuclear energy and the production, possession and use of nuclear substances, prescribed equipment and prescribed information to prevent unreasonable risk to national security, the environment and the health and safety of persons. The activities of the CNSC must be undertaken to achieve conformity with measures of control and international obligations that Canada has agreed to. The CNSC is also responsible for the dissemination of objective, scientific, technical and regulatory information to the public regarding the CNSC's activities and the effects of the development, production, possession and use of nuclear energy on the environment and on the health and safety of persons.

It is the CNSC that issues licenses allowing the possession, transfer, import, export, use and abandonment of nuclear substances, prescribed equipment and prescribed information. The CNSC may also issue licenses required for the mining, production, refining, conversion, enrichment, processing, reprocessing, packaging, transportation and management of nuclear substances and decommissioning of facilities. The scope of the CNSC's licensing powers also includes the measures taken for the storage and disposal of nuclear substances. This is established through ss. 24 and 26 of the *Nuclear Safety and Control Act* which state:

24. (1) Licences – The Commission may establish classes of licences authorizing the licensee to carry on any activity described in any of paragraphs 26(a) to (f) that is specified in the licence for the period that is specified in the licence.

...

26. Prohibitions – Subject to the regulations, no person shall, except in accordance with a licence,

- (a) possess, transfer, import, export, use or abandon a nuclear substance, prescribed equipment or prescribed information;
- (b) mine, produce, refine, convert, enrich, process, reprocess, package, transport, manage, store or dispose of a nuclear substance;

...

The scope of the CNSC's powers over these issues includes the ability to make a variety of regulations, including regulations to address the following:

44. Regulations - The Commission may, with the approval of the Governor-in-Council, make Regulations

...

- (b) respecting the mining, production, refinement, conversion, enrichment, processing, reprocessing, possession, import, export, use, packaging, transport, management, storage, disposal and abandonment of a nuclear substance;
- (c) respecting the design, inspection during production or installation, production, possession, storage, import, export, use, decommissioning, abandonment and disposal of prescribed equipment;

...

- (e) respecting the location, design, construction, installation, operation, maintenance, modification, decommissioning, abandonment and disposal of a nuclear facility or part of a nuclear facility;
- (f) respecting the protection of the environment and the health and safety of persons from any risks associated with the activities referred to in paragraphs (a), (b), (c) and (e);

Activities involved in the disposal of nuclear substances are therefore prohibited unless expressly approved in a licence issued by the CNSC. All of the stages involved in the disposal of nuclear substances, including interim and long-term storage and disposal and any transportation between, will therefore require a CNSC licence. Licensees are bound to comply with the terms and conditions of each licence as they are set by the CNSC.

The Act ensures that individuals involved in matters before the CNSC have an opportunity to be heard and also provides opportunities for appeals and judicial reviews of CNSC decisions. Furthermore, public hearings may be held when the Commission proposes to issue, renew, suspend, amend, revoke or replace a licence. The Commission may also hold public hearings when it believes that it would be in the public interest to do so. Members of the public may therefore participate in hearings and may also request intervenor status.²⁷

Regulations under the Nuclear Safety and Control Act

There are a variety of Regulations promulgated under the *Nuclear Safety and Control Act* that establish requirements for the management of nuclear substances that will incidentally be important to the disposal of nuclear waste. The Regulations of general application establish rules

²⁷ *Canadian Nuclear Safety Commission Rules of Procedure*, S.O.R./2000-211.

applicable to various aspects of nuclear waste management. The Regulations that specifically make reference to the disposal of nuclear substances do so in the context of record keeping requirements and information submitted for license applications.

(i) Class I Nuclear Facilities Regulations

The *Class I Nuclear Facilities Regulations*²⁸ apply to both Class IA and Class IB nuclear facilities.

Class IA nuclear facilities are defined as (a) a nuclear fission or fusion reactor or subcritical nuclear assembly; or (b) a vehicle that is equipped with a nuclear reactor.

Class IB facilities have one of the following characteristics: (a) a particle accelerator with a beam energy equal to or greater than 50 MeV; (b) a plant for the processing, reprocessing or separation of an isotope of uranium, thorium or plutonium; (c) a plant for the manufacture of a product from uranium, thorium or plutonium; (d) a plant, other than a Class II nuclear facility as defined in section 1 of the *Class II Nuclear Facilities and Prescribed Equipment Regulations* for the processing or use, in a quantity greater than 1015 Bq per calendar year, of nuclear substances other than uranium, thorium or plutonium; (e) a facility for the disposal of a nuclear substance generated at another nuclear facility; and (f) a facility prescribed by paragraph 19(a) or (b) of the *General Nuclear Safety and Control Regulations*.

These Regulations list the information that must be included in applications for licences to operate Class I facilities. For example, proposed measures for the handling, storage, loading and transportation of nuclear substances must be detailed in the application for a licence to operate.

The decommissioning and abandonment of Class I facilities requires a separate licence. Licensees that decommission Class I nuclear facilities are required to keep a record of how and where any nuclear waste is managed, stored, disposed of or transferred to as a result of the decommissioning of the facility.

(ii) Class II Nuclear Facilities Regulations

Class II nuclear facilities are defined in the *Class II Nuclear Facilities Regulations*²⁹ as any of the following nuclear facilities: (a) a particle accelerator with a beam energy of less than 50 MeV that is capable of producing nuclear energy; or (b) a facility prescribed by paragraph 19(c) of the *General Nuclear Safety and Control Regulations*.

²⁸ S.O.R./2000-204.

²⁹ S.O.R./2000-205.

These Regulations list the information that must be included in applications for licences to operate Class II facilities. For example, proposed measures for the handling, storage, loading and transportation of nuclear substances must be detailed in the application for a licence to operate.

(iii) General Nuclear Safety and Control Regulations

The general requirements for a licence application include the identification (describing the name, quantity, form, origin and volume) of any radioactive waste that may result from the activity that is the subject of the application. The *General Nuclear Safety and Control Regulations*³⁰ also require the submission of information regarding the proposed method for managing and disposing of such radioactive waste including that intended to be stored, managed, processed or disposed of on-site. The abandonment of nuclear substances, facilities, and prescribed equipment and facilities requires a separate licence. Prescribed nuclear facilities include those used for “the management, storage or disposal of waste containing radioactive nuclear substances at which the resident inventory of radioactive nuclear substances contained in the waste is 10^{15} Bq or more.”³¹

(iv) Nuclear Non-Proliferation Import and Export Control Regulations

The *Nuclear Non-Proliferation Import and Export Control Regulations*³² require licences for the import and export of controlled nuclear substances, controlled nuclear equipment and controlled nuclear information. In the Schedule, these Regulations provide an extensive list of controlled nuclear substances, equipment and information. The information that must be submitted in an application for a licence to import or export these controlled nuclear substances, equipment and information is listed and includes a description of the intended end-use of the substance, equipment or information as well as the intended final destination of the substance, equipment or information.

(v) Nuclear Safety Regulations

Information regarding protection arrangements and proposed security equipment is required to be included in licence applications for nuclear facilities consisting of a nuclear reactor that may exceed 10 MW thermal power during normal operation. Security plans are also required to be submitted with applications for a licence to transport nuclear material.

³⁰ S.O.R./2000-202.

³¹ *Ibid.* at s. 19(a).

³² S.O.R./2000-210.

The *Nuclear Safety Regulations*³³ also prescribe security requirements for the processing, use and storage of all classes of nuclear material. The degree of protection required at each location varies according to the class of nuclear material being processed, used or stored. The characteristics of the security measures to be implemented for each class are prescribed by this Regulation as it addresses the degree of protection needed and the requirement for protective structures or barriers and a security monitoring room. Access to protected areas must be limited to those authorized to enter.

(vi) Nuclear Substances and Radiation Devices Regulations

The *Nuclear Substances and Radiation Devices Regulations*³⁴ requires licensees to record the transfer, receipt, disposal or abandonment of a nuclear substance. Required contents of the record include the relevant date, the name and address of the supplier or recipient, the recipient's licence number, the name, quantity and form of the relevant nuclear substance and any applicable model and serial numbers. Records must also be kept regarding the date of disposal of any exposure devices and their accessories.

(vii) Packaging and Transport of Nuclear Substances Regulations

The *Packaging and Transport of Nuclear Substances Regulations*³⁵ apply to the packaging and transport of nuclear substances including the design, production, use and maintenance of packaging and packages and the preparation, consigning, handling, loading, carriage, storage during transport, receipt at final destination and unloading of packages, subject to certain defined exceptions.

These Regulations establish carrier licensing requirements for certain classes of nuclear substances and reporting obligations in the event of a dangerous occurrence. General obligations for transporters, consignors and carriers of nuclear substances are prescribed. The Regulations also detail packaging requirements, the certification of packaging for future use, and the means of containment for nuclear materials being transported, incorporating by reference in certain circumstances the *Regulations for the Safe Transport of Radioactive Material*, published by the International Atomic Energy Agency.

Information required to be included in transport documents is listed in the Regulation. Consignors, carriers and consignees of radioactive material are required to implement a radiation protection program. A general obligation is also established, for all persons who transport or

³³ S.O.R./2000-209.

³⁴ S.O.R./2000-207.

³⁵ S.O.R./2000-208.

cause to be transported, radioactive material, to act in accordance with the requirements of the *Transportation of Dangerous Goods Regulations*.³⁶

At the time of writing, these Regulations were the subject of proposed amendments that were not yet formally adopted.

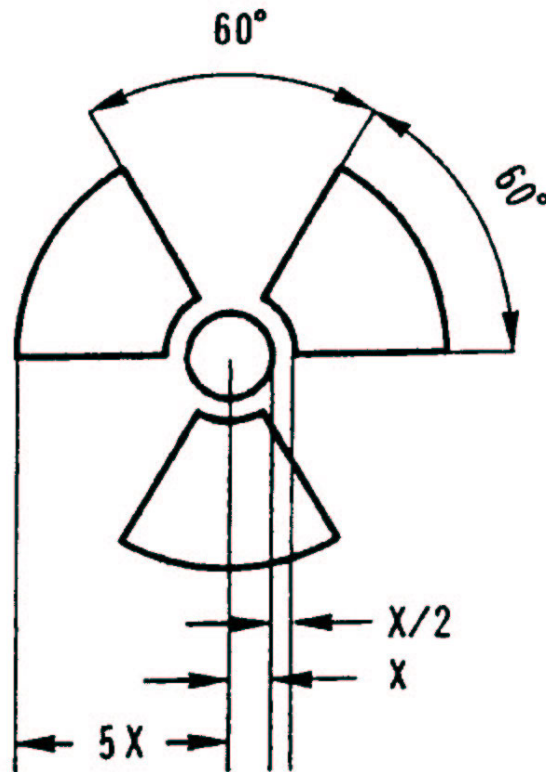
(viii) Radiation Protection Regulations

Radiation dose limits for employees set by the *Radiation Protection Regulations*³⁷ are of importance with respect to occupational health and safety issues that may arise during high-level nuclear waste disposal. The *Radiation Protection Regulations* also establish requirements for the labelling of containers and devices that contain radioactive nuclear substances and indicate when the posting of warning signs and symbols is necessary. For the purposes of such postings, the prescribed radiation warning symbol must be displayed:

³⁶ S.O.R./2001-286.

³⁷ S.O.R./2000-203.

RADIATION WARNING SYMBOL



NOTE:

The three blades and the central disk of the symbol shall be
 (a) magenta or black; and
 (b) located on a yellow background.

(ix) Uranium Mines and Mills Regulations

These Regulations apply only to uranium mines and mills. Wastes resulting from activities of uranium mines and mills are therefore subject to these Regulations. Due to the character of wastes from uranium mine and mill tailings, these wastes are more easily managed and disposed of than substances with higher levels of radioactivity. Waste management systems are already in place in Canada for uranium mine and mill tailings and are subject to the *Uranium Mines and Mills Regulations*.³⁸ These Regulations define “waste management systems” as “a system for collecting, transporting, receiving, treating, processing, storing or disposing of the wastes that are produced as a result of the licensed activity at a uranium mine or mill.” Since disposal of these

³⁸ S.O.R./2000-206.

wastes is commonplace, a description of the proposed waste management system is a general requirement for any licence application under the Regulations.

Legislation of General Application

(a) *Canadian Environmental Assessment Act*

A federal environmental assessment is required by s. 5(1)(d) of the *Canadian Environmental Assessment Act* (“CEAA”) before the CNSC, a federal authority, issues licences authorizing activities involving nuclear substances. As noted in the discussion above, according to the *Nuclear Safety and Control Act* and its Regulations, activities involved in the disposal of nuclear substances are prohibited unless they are expressly approved in a licence issued by the CNSC. All of the stages involved in the procedure of disposing of nuclear substances, including interim and long-term storage and disposal and any transportation between, require a CNSC licence.

CEAA’s Law List Regulations,³⁹ a list of legislation and regulations that fall within the scope of CEAA, refers to s. 25(1)(b) of the *Atomic Energy Control Regulations* which required a licence or written instructions of the AECB for proper abandonment or disposal of a nuclear substance. Although the reference to the *Atomic Energy Control Regulations* has not yet been changed to reflect the parallel provisions of the new *Nuclear Safety and Control Act* noted above, the *Law List Regulations* listing remains valid and enforceable. Projects involving the abandonment or disposal of nuclear substances therefore trigger the application of CEAA and must be subject to an environmental assessment.

The Government of Canada’s approach for managing Canada’s used nuclear fuel will be subject to an environmental assessment. The purpose of an environmental assessment is to assess the environmental effects of a project. This may be achieved by (a) screening or conducting a comprehensive study on the project, (b) mediation or assessment by a review panel, and (c) designing and implementing a follow-up program.

The *Comprehensive Study List Regulation*⁴⁰ requires comprehensive studies for defined projects and classes of projects, including:

19. The proposed construction, decommissioning or abandonment, or an expansion that would result in an increase in production capacity of more than 35 per cent, of

...

(g) a facility that is on a site that is not within the boundaries of an existing licensed nuclear facility and is for

³⁹ S.O.R./94-636.

⁴⁰ S.O.R./94-638.

- (i) the storage of irradiated nuclear fuel, where the facility has an irradiated nuclear fuel inventory capacity of more than 500 t,
- (ii) the processing or storage of radioactive waste other than irradiated nuclear fuel, where
 - (A) the activity of the throughput of radioactive material with a half-life greater than one year is more than 1 TBq/a, or
 - (B) the activity of the inventory of radioactive material with a half-life greater than one year is more than 100 TBq, or
- (iii) the disposal of radioactive prescribed substances within the meaning assigned in section 2 of the *Atomic Energy Control Act*.

Factors to be considered in a federal environmental assessment are prescribed by s. 16 of *CEAA*.

16. (1) Every screening or comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

- (a) the environmental effects of the project, including the environmental effects of malfunctions or accidents that may occur in connection with the project and any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out;
- (b) the significance of the effects referred to in paragraph (a);
- (c) comments from the public that are received in accordance with this Act and the regulations;
- (d) measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project; and
- (e) any other matter relevant to the screening, comprehensive study, mediation or assessment by a review panel, such as the need for the project and alternatives to the project, that the responsible authority or, except in the case of a screening, the Minister after consulting with the responsible authority, may require to be considered.

(2) In addition to the factors set out in subsection (1), every comprehensive study of a project and every mediation or assessment by a review panel shall include a consideration of the following factors:

- (a) the purpose of the project;

- (b) alternative means of carrying out the project that are technically and economically feasible and the environmental effects of any such alternative means;
 - (c) the need for, and the requirements of, any follow-up program in respect of the project; and
 - (d) the capacity of renewable resources that are likely to be significantly affected by the project to meet the needs of the present and those of the future.
- (3) The scope of the factors to be taken into consideration pursuant to paragraphs (1)(a), (b) and (d) and (2)(b), (c) and (d) shall be determined
- (a) by the responsible authority; or
 - (b) where a project is referred to a mediator or a review panel, by the Minister, after consulting the responsible authority, when fixing the terms of reference of the mediation or review panel.

CEAA and its Regulations set out the procedure, reports and public notice requirements for each assessment process. Sections 5(2)(b)(i) and 11 of *CEAA* impose a requirement that the environmental assessment be conducted “as early as is practicable in the planning stages of the project and before irrevocable decisions are made”.

Example EA Guidelines

It is useful to consider the components of a recently approved environmental assessment to illustrate the criteria that have been required of an environmental assessment involving nuclear substances. For this purpose, the most recently approved *EA Guidelines (Scope of Project and Assessment): Environmental Assessment of the Proposed Pickering Waste Management Facility, Phase II, Pickering, Ontario* is reviewed below.⁴¹ EA Guidelines are issued for each individual project. These Guidelines describe the basis for the conduct of the environmental assessment, in this case through screening, and focus the assessment on issues and concerns relevant to the individual project. All physical works involved in the proposed project are identified in order to properly assess the scope of the project.

It is interesting to note that the scope of the EA Guidelines approved for Pickering’s proposed waste management facility specifically exclude long-term waste management considerations since the approach to long-term management of radioactive waste is currently being developed through separate federal legislation. It should also be noted that the final approval of these guidelines was reached following opportunities for public review and comment.

⁴¹ Approved May 8, 2003.

The EA Guidelines provide a detailed description of required components of the screening, which is delegated to the proponent of the project. Some of the factors considered throughout the environmental assessment screening will be the environmental effects of the project, their significance and any available measures to mitigate these effects. Various activities likely to be undertaken by the CNSC throughout the environmental assessment process are listed as follows:

- Determination of the application of *CEAA* to the project, including application of the Federal Coordination Regulation; establishment of Public Registry; and stakeholder notification;
- Preparation of working draft of EA Guidelines; distribution of draft EA Guidelines to proponent and federal and provincial authorities; receipt of comments from federal and provincial authorities and preparation of draft for public comment;
- Distribution of draft EA Guidelines for comment by public, including from the municipal government of the relevant municipality;
- CNSC staff review and disposition of comments received; revision of Draft EA Guidelines for submission to the Commission of CNSC; Commission of CNSC approval of EA Guidelines;
- CNSC staff delegation of consultative and technical studies to the proponent;
- Distribution of draft EA study report to review team (CNSC staff, federal and provincial authorities); revision, as appropriate, of EA study report; CNSC staff preparation of draft screening report;
- Public review and comment on draft screening report; CNSC staff review and dispositioning of public comments; CNSC completion of screening report;
- CNSC staff preparation of screening report to CMD for Commission consideration; Public notification of Commission Hearing;
- CMD presentation of screening report to Commission Hearing (One-day hearing);
- Commission Record of Decision on screening report; and
- Commission Licensing Hearing.

(b) *Transportation of Dangerous Goods Act, 1992* and its Regulations

For the purposes of the *Transportation of Dangerous Goods Act, 1992*,⁴² nuclear substances (as defined by the *Nuclear Safety and Control Act*) that are radioactive are included in Class 7 and

⁴² S.C. 1992, c. 34.

are considered dangerous goods. Proper transportation of dangerous goods requires compliance with safety standards and requirements, the display of proper safety marks and the presence of proper documentation.

However, the *Transportation of Dangerous Goods Regulations*⁴³ exempts radioactive materials that meet the exempting conditions below:

1.43 Class 7, Radioactive Materials – These Regulations do not apply to Class 7, Radioactive Materials if the radioactive materials satisfy the conditions for an excepted package in the *Packaging and Transport of Nuclear Substances Regulations* and they are accompanied by a shipping document that, despite sections 3.5 and 3.6 of Part 3, Documentation, includes the shipping name and UN number of the radioactive materials.

Nonetheless, the *Packaging and Transport of Nuclear Substances Regulations* provide:

15. (1) Every person who transports, or causes to be transported, radioactive material shall act in accordance with the requirements of the *Transportation of Dangerous Goods Regulations*.

The *Transportation of Dangerous Goods Regulations* provide instruction for the classification of dangerous goods. According to the Regulations, substances included in Class 7 are those with a specific activity greater than 70kBq/kg.⁴⁴

Specific safety standards and requirements, documentation and safety marks are also prescribed by the Regulations. For example, radioactive materials included in Class 7 must be marked with the appropriate label, placard and other safety marks. The size, location and content of safety marks are also prescribed by the Regulations.

Approved emergency response assistance plans are explicitly required for the transportation of all radioactive materials.⁴⁵ The Regulation also provides general requirements for employee training.⁴⁶

(c) *Canadian Environmental Protection Act, 1999* and its Regulations

Division 8 of the *Canadian Environmental Protection Act, 1999* (“*CEPA, 1999*”) describes the boundaries of control of movement of hazardous waste and hazardous recyclable material and of

⁴³ S.O.R./2001-286.

⁴⁴ *Ibid.*, Part 2, s. 2.37.

⁴⁵ *Ibid.*, Part 7, s. 7.1.

⁴⁶ *Ibid.*, Part 6.

non-prescribed non-hazardous waste for final disposal. Movement of these wastes and materials requires a permit issued by the federal Minister of the Environment who has the discretion to refuse a permit application if it is believed that the waste or material will not be managed so that the environment and human health are protected.

While this aspect of *CEPA, 1999* is meant to address the environmental aspects of interprovincial shipments of hazardous wastes and recyclable materials that are addressed under the *Transportation of Dangerous Goods Regulations* discussed above, nuclear substances that are radioactive are not included in the definition of “hazardous waste” provided in the *Export and Import of Hazardous Wastes Regulations*⁴⁷ and the *Interprovincial Movement of Hazardous Waste Regulations*,⁴⁸ both of which are promulgated under the *CEPA, 1999*. Nuclear substances are also explicitly excluded from the scope of *CEPA, 1999*’s *Export of Substances Under the Rotterdam Convention Regulations*.⁴⁹

(d) *Hazardous Products Act*

The definitions provided to describe the products that are subject to the *Hazardous Products Act*⁵⁰ are broadly worded and may be interpreted to include nuclear substances. However, Parts I & II of the Act, which prohibit the advertising, sale and importation of hazardous products, explicitly exclude nuclear substances that are radioactive from the scope of the prohibition.

Summary of Federal Legislation

Canada’s *Nuclear Fuel Waste Act* and the *Nuclear Safety and Control Act* are relevant to the management of high-level radioactive waste. The *Nuclear Fuel Waste Act* provides a framework for a future decision in Canada regarding the long-term management of nuclear fuel waste based on a comprehensive, integrated and economically sound approach. This Act provides for the establishment of the NWMO and describes the duties of the organization: to present the Government of Canada with potential approaches and realistic recommendations for the management of nuclear fuel waste; and to implement the adopted approach.

The *Nuclear Safety and Control Act* prohibits certain activities involved in the management of nuclear substances. The Act also gives the CNSC the authority to issue licences to allow the possession, transfer, import, export, use and abandonment of nuclear substances. The CNSC may also issue licences required for the mining, production, refining, conversion, enrichment,

⁴⁷ S.O.R./92-637, s. 2(1) “hazardous waste”.

⁴⁸ S.O.R./2002-301, s. 1 “hazardous waste”.

⁴⁹ S.O.R./2002-317, s. 2(2).

⁵⁰ R.S.C. 1985, c. H-3.

processing, reprocessing, packaging, transportation and management of nuclear substances and decommission of facilities. Licensees are bound to comply with the terms and conditions of each licence as they are set by the CNSC. All of the stages involved in the disposal of nuclear substances, including interim and long-term storage and disposal and any transportation between, will require a CNSC licence. Regulations promulgated under the *Nuclear Safety and Control Act* prescribe requirements for occupational health and safety, obligations during the transportation of radioactive materials and security measures for the processing, use and storage of all classes of nuclear material. Information submitted for licence applications includes the proposed measures for the handling, storage, loading and transportation of nuclear substances while certain activities require the licensee to keep prescribed information.

Canadian laws of general application that are relevant to aspects of the management of high-level nuclear waste include the *Canadian Environmental Assessment Act*, and the *Transportation of Dangerous Goods Act, 1992*. An environmental assessment is required prior to the issuance of licences by the CNSC that authorize activities involving nuclear substances. Since all of the aspects involved in the project of managing nuclear waste, including interim and long-term storage and disposal and any transportation between, must be authorized through the issuance of a CNSC licence, each of these aspects must also be considered in the environmental assessment of the project. Certain projects, as defined by the *Comprehensive Studies List Regulations*, are required to be subject to a comprehensive study. The environmental assessment must be conducted “as soon as practicable in the planning stages and before irrevocable decisions are made”.

While the *Transportation of Dangerous Goods Act, 1992* includes radioactive materials in its listing of dangerous goods, the *Transportation of Dangerous Goods Regulations* exempt radioactive materials from the scope of the Regulations if the radioactive materials meet specified requirements of the *Packaging and Transport of Nuclear Substances Regulations*.

PART IV – FEDERAL POLICIES AND GUIDELINES

Regulatory documents issued by both the CNSC, and its predecessor, the AECB, supplement the legally binding legislation discussed in Part III. Although these instruments are not legally binding, their purpose is to provide instruction, assistance and information regarding legally binding legislative and regulatory requirements. CNSC Policies, Standards and Guidelines addressing protection of the environment, reporting requirements, decommissioning planning, financial guarantees and security measures are discussed below. Relevant Draft Regulatory Policies addressing the management of radioactive wastes and public access to information held by the CNSC are also discussed. Two notable Regulatory Policy Statements issued by the AECB that address the disposal of nuclear fuel waste and radioactive wastes are also discussed.

CNSC Policies and Guidelines

The CNSC has issued and drafted a variety of relevant policies, regulatory guides and regulatory standards. Regulatory policies are described as “a document that describes the philosophy, principles and fundamental factors used by the CNSC in its regulatory program”. A regulatory guide is defined as “a document that provides guidance or describes characteristics or practices that the CNSC recommends for meeting regulatory requirements or improving administrative effectiveness”. Finally, a regulatory standard is “a document that is suitable for use in compliance assessment and describes rules, characteristics or practices which the CNSC accepts as meeting the regulatory requirements”. Although these documents are not legally binding, they do provide insight into the factors considered by the CNSC throughout its decision-making processes. Regulatory policies, guides and standards are issued by the CNSC in order to provide instruction, assistance and information regarding the application of and requirements imposed by legislation, regulations and CNSC licences and directives.

(a) Protection of the Environment

A recent Regulatory Policy that draws attention to the inclusion of environmental considerations in the CNSC’s mandate is entitled *Protection of the Environment*.⁵¹ This document notes the policy of the CNSC that requires applicants to demonstrate the adequacy of their environmental protection provisions. It is recommended that licensees take measures to protect the environment that (a) are commensurate with the likelihood and significance of adverse environmental effects, (b) recognize that variability exists in potentially adverse environmental effects as a consequence of differences in regulated activities, substances, equipment, facilities, the environment and its human components, (c) recognize that uncertainty exists in science, and therefore prevent unreasonable risk by keeping all releases to the environment as low as reasonably achievable while taking social and economic factors into account, and (d) be judged against performance

⁵¹ CNSC, Regulatory Policy P-223, *Protection of the Environment* (February 2001).

indicators and targets which are based on sound science. This Regulatory Policy also notes that, when reviewing license applications, the CNSC will consider the following factors in the context of protection of the environment:

- the environmental effects that may be associated with the regulated activities, substances, equipment or facilities over time;
- the measures proposed or taken to mitigate residual environmental effects to allow future uses for the site;
- the measures proposed or taken to mitigate the potentially significant adverse environmental effects of the regulated activities, substances, equipment or facilities under normal conditions and for accidents and malfunctions;
- stakeholder concerns; and
- any other information that it considers relevant.

(b) Reporting Requirements for Operating Nuclear Power Plants

The CNSC's Regulatory Standard entitled *Reporting Requirements for Operating Nuclear Power Plants*⁵² was recently issued in March of 2003. This document provides further detail for reporting licensees. Compliance with the details provided in this Regulatory Standard becomes mandatory in the event that it is incorporated into the license issued by the CNSC. This Regulatory Standard describes situations that require unscheduled reporting and notifications or reports and provides instruction regarding the content of various types of scheduled reporting. One type of scheduled report that is required to be submitted by licensees includes information regarding the inventory and transfer of fissionable and fertile substances at the operating nuclear power plant.

(c) Decommissioning Planning for Licensed Activities

In response to the *Nuclear Safety and Control Act*'s requirement that a licensee have adequate provisions for the safe operation and decommissioning of operations, the CNSC has issued a Regulatory Guide entitled *Decommissioning Planning for Licensed Activities*.⁵³ Specific methods are not prescribed by legislation, which allows flexibility for individual circumstances. Materials and waste management planning is addressed in this Regulatory Guide as it provides generic outlines of the structure and content of preliminary and detailed decommissioning plans.

⁵² CNSC, Regulatory Standard S-99, *Reporting Requirements for Operating Nuclear Power Plants* (March 2003).

⁵³ CNSC, Regulatory Guide G-219, *Decommissioning Planning for Licensed Activities* (June 2000).

A required component of the detailed decommissioning plan is a materials and waste management plan that describes the systematic process for how materials will be moved from the disassembly areas to areas designated for monitoring, segregating, processing, packaging, transfer or disposal. The preliminary decommissioning plan must also document the ultimate destination of materials arising from decommissioning activities. An example of work packages involved in the decommissioning of a nuclear power plant is included to identify generic areas requiring attention during decommissioning.

(d) Financial Guarantees for the Decommissioning of Licensed Activities

The CNSC has also issued a Regulatory Policy addressing *Financial Guarantees for the Decommissioning of Licensed Activities*.⁵⁴ Financial guarantees are an important aspect of decommissioning plans as they must be sufficient to cover the cost of decommissioning work resulting from licensed activities that have taken place both prior to and during the licence period. The financial guarantee provided must be at an arm's length from the licensee and must be accessible on demand in the event that the licensee is not available to fulfil decommissioning obligations. Criteria that the CNSC considers in assessing the acceptability of financial guarantees include liquidity, certainty of value, adequacy of value and continuity. While parent company guarantees and pledges of assets are not acceptable, some examples of acceptable financial guarantees are cash, irrevocable letters of credit, surety bonds, insurance and expressed commitments from a government. The CNSC must be satisfied that arrangements for the administration of financial guarantees must be clearly defined and legally enforceable.

(e) Environmental Assessment

The CNSC has not yet issued any regulatory documents outlining the required contents of an environmental assessment. An example of approved guidelines for an environmental assessment conducted through a screening is provided in the discussion of *CEAA* in Part III.

(f) Security Measures

The CNSC recently issued Regulatory Guides addressing security measures that apply to nuclear facilities, entitled *Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities*,⁵⁵ and the transportation of nuclear material, entitled *Transportation Security Plans for*

⁵⁴ CNSC, Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities* (June 2000).

⁵⁵ CNSC, Regulatory Guide G-274, *Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities* (March 2003).

*Category I, II or III Nuclear Material.*⁵⁶ The establishment and implementation of security programs and plans are important to ensure that access to these nuclear materials is limited while the materials are managed properly and are handled only by individuals that are properly trained and certified. These Regulatory Guides are related to requirements imposed by the *General Nuclear Safety and Control Regulations*, the *Nuclear Security Regulations* and the *Class I Nuclear Facilities Regulations*, all promulgated under the *Nuclear Safety and Control Act* as discussed above.

(g) Managing Radioactive Wastes (Draft Regulatory Policy)

In April of 2003 the CNSC released a Draft Regulatory Policy entitled *Managing Radioactive Wastes*⁵⁷ for public consultation and comment. The stated purpose of this policy reflects the CNSC's mandate and the purpose of Canada's *Nuclear Safety and Control Act*. The Draft Policy indicates that the principles that are applied to each situation by the CNSC when making a regulatory decision concerning the management of radioactive waste are as follows:

- The generation of radioactive waste should be minimized to the extent practicable by the implementation of design measures and operating and decommissioning practices;
- Radioactive waste should be managed in a manner that is commensurate with its radiological, chemical and biological hazards to the environment and to the health and safety of persons;
- The anticipated impacts on the environment, and on the health and safety of persons, from the future management of the radioactive waste should not be greater than those that are currently permissible in Canada;
- The establishment of arrangements to fund any measures needed to protect the environment and persons from the radioactive waste should not be greater than those that are currently permissible in Canada;
- The establishment of arrangements to fund any measures needed to protect the environment and persons from the radioactive waste, and the implementation of such measures should not be deferred unduly so as to impose a burden on future generations;
- The period over which the future impacts of radioactive waste on the environment and the health and safety of persons are assessed should include the period over which the maximum impacts are anticipated; and

⁵⁶ CNSC, Regulatory Guide G-208, *Transportation Security Plans for Category I, II or III Nuclear Material* (March 2003).

⁵⁷ CNSC, Draft Regulatory Policy P-290, *Managing Radioactive Waste* (issued for public consultation: April 2003).

- The trans-boarder effects on the health and safety of persons and on the environment that could result from the management of radioactive waste in Canada should not be greater than the effects experienced in Canada.

If adopted, this Regulatory Policy will be relevant to all waste management phases, practices and considerations including the generation, handling, processing, controlled release, storage, disposal and abandonment of radioactive waste.

(h) Public Access to Information Held at the CNSC (Draft Regulatory Policy)

Another relevant Draft Regulatory Policy that has recently been released by the CNSC for public consultation and comment is entitled *Public Access to Information held at the CNSC*.⁵⁸ If adopted, this Regulatory Policy will replace the former AECB Information Bulletin entitled *Atomic Energy Control Board Policy on Public Access to Licensing Information*. This draft policy clearly establishes the CNSC's intention to facilitate public access to information. The policy statement states: "As an organization that values openness and transparency, it is the policy of the CNSC to make the information it holds easily accessible to the public within the limits provided by relevant federal legislation and policies." While the process of both formal and informal requests are recognized, the policy encourages the release of information informally whenever possible.

If adopted, the transparency of the operations of the CNSC as stated in this Regulatory Policy will be relevant to all parties that interact with the CNSC.

AECB Regulatory Policy Statements

The AECB had issued Regulatory Policy Statements addressing the disposal of high-level radioactive waste. Regulatory Policy Statements were described by the AECB as: "firm expressions that particular 'requirements' not expressed as Regulations or Licence Conditions be complied with or that any requirements be met in a particular manner but where the AECB retains the discretion to allow deviations or to consider alternative means of attaining the same objectives where a satisfactory case is made." Two notable Regulatory Policies issued by the AECB are the *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concept Assessment Phase*,⁵⁹ issued in 1985, and *Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes* –

⁵⁸ CNSC, Draft Regulatory Policy C-287, *Public Access to Information held at the CNSC* (issued for public consultation: January 2003).

⁵⁹ AECB, Regulatory Document R-71, *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concept Assessment Phase* (January 1985).

Long-Term Aspects,⁶⁰ issued in 1987. Both of these Regulatory Policy Statements were issued by the AECB in response to Canada's initial attempt to identify a method for disposal of radioactive waste. While the CNSC has withdrawn the later of these two policies,⁶¹ the contents of the document remain a useful tool as historical reference material.

(a) *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concept Assessment Phase*

The AECB's review of the generic concept of deep geological disposal of nuclear fuel waste presented in the Regulatory Policy Statement entitled *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concepts Assessment Phase* was undertaken because it was expected that the nuclear disposal site would be subject to licensing by the AECB. It was also expected that members of the AECB would lead the review with assistance from Environment Canada and Ontario's Ministry of the Environment. Although the concept of deep geological disposal was later subject to public review through an federal environmental assessment, this Regulatory Policy Statement has been adopted by the CNSC and is considered a current regulatory document.

For the purposes of the Regulatory Policy Statement, the AECB had the responsibility to conduct a review of the technical issues while Environment Canada and Ontario's Ministry of the Environment took responsibility to ensure that social and economic issues were given due consideration. The proposed disposal concept was separated into two phases: pre-closure and post-closure. The AECB noted that compliance with regulations regarding radiological health and safety, conventional health and safety, environmental protection, safeguards and security and transportation of radioactive material would be important within the pre-closure period. Following closure of the facility, the probability of radiation emissions must be small. Other requirements noted addressed the structure and sustainability of the facility as well as contingency plans.

Requirements of the assessment are also outlined in this document. From ensuring that the problem has been properly defined to confirming that the proposed solution addresses the problem, it is explained that the assessment must thoroughly consider all aspects of this method of nuclear fuel waste disposal. This includes the effects on humans and the environment, socio-economic impacts and required technology.

⁶⁰ AECB, Regulatory Document R-104, *Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes – Long-term Aspects* (June 1987).

⁶¹ Canadian Nuclear Safety Commission, *Withdrawn Documents*, online: <<http://www.nuclearsafety.gc.ca/eng/licensees/documents/Withdrawn.cfm>> (last modified: 26 June, 2003).

(b) *Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes – Long-Term Aspects*

The AECB's former Regulatory Policy Statement entitled *Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes – Long-Term Aspects* was withdrawn following a review that revealed that the contents of the document were out of date due to legislative changes and technological advances that had occurred since the document was issued in 1987. Despite the withdrawn status of the document, its approach to the issues is worthy of consideration.

The objectives of radioactive waste disposal in 1987 were to minimize any burden placed on future generations; to protect the environment; and to protect human health while taking into account social and economic factors. It was noted that the minimization of burdens on future generations would take place by (a) selecting disposal options for radioactive wastes which, to the extent reasonably achievable, do not rely on long-term institutional controls as a necessary safety feature, (b) implementing these disposal options at an appropriate time, technical, social and economic factors being taken into account, and (c) ensuring that there are no predicted future risks to human health and the environment that would not be currently accepted.

Protection of the environment was addressed through the following statement: "Radioactive waste disposal options shall be implemented in a manner such that there are no predicted future impacts on the environment that would not be currently accepted and such that the future use of natural resources is not prevented by either radioactive or non-radioactive contaminants." This was described as a concern that is secondary to radiation protection and arises out of the protection of humans.

The principles applicable to the protection of human health were focused on the limitation of risk. The general requirement is stated as follows: "The predicted radiological risk to individuals from a waste disposal facility shall not exceed 10^{-6} fatal concerns and serious genetic effects in a year, calculated without taking advantage of long-term institutional controls as a safety feature." An opportunity for adopting a different standard based on an optimisation study on a case-by-case basis when the general requirement cannot be met was also available. The document also provided guidelines for the basic requirements including how to identify the risk, how to quantify the probabilities of exposure scenarios, the relevant timescale and acceptable statistical confidence levels.

Although this Regulatory Policy Statement has been withdrawn, some aspects of its content are currently reflected in Canada's current regulatory requirements discussed above. The CNSC's recently released Draft Regulatory Policy entitled *Managing Radioactive Wastes*, discussed above, implements certain policy statements from the withdrawn Regulatory Policy Statement that remain relevant while those that are no longer relevant are discontinued through the withdrawal of the Regulatory Policy Statement.

Summary of Federal Policies and Guidelines

Regulatory documents issued by both the CNSC, and its predecessor, the AECB, supplement the legally binding legislation discussed in Part III. Although these documents are not legally binding, their purpose is to provide instruction, assistance and information regarding legally binding legislative and regulatory requirements. A CNSC Policy, *Protection of the Environment* was discussed above, as well as a CNSC Standard, *Reporting Requirements for Operating Nuclear Power Plants*. Regulatory Guides issued by the CNSC that were also discussed include: (a) *Decommissioning Planning for Licensed Activities*, (b) *Financial Guarantees for the Decommissioning of Licensed Activities*, (c) *Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities*, (d) *Transportation Plans for Category I, II or III Nuclear Material*. Relevant Draft Regulatory Policies were also discussed including *Managing Radioactive Wastes* and *Public Access to Information Held at the CNSC*, both of which have been issued for public consultation. Two notable Regulatory Policy Statements issued by the AECB were also discussed: *Deep Geological Disposal of Nuclear Fuel Waste: Background Information and Regulatory Requirements Regarding the Concept Assessment Phase and Regulatory Objectives, Requirements and Guidelines for the Disposal of Radioactive Wastes – Long Term Aspects*.

PART V – PROVINCIAL AND TERRITORIAL LEGISLATION

Although it has been clearly established by the Supreme Court of Canada that Canada’s constitutional division of powers confers the authority to regulate nuclear energy to the federal government, this does not exclude provincial authority to regulate related matters within the provincial domain. Indeed, the following provincial legislative provisions establish provincial requirements for the management of radioactive material.

(a) Alberta

Nuclear substances are included in the definition of “dangerous goods” in both the *Dangerous Goods Transportation and Handling Act*⁶² and the *Dangerous Goods Transportation and Handling Regulation*.⁶³ Dangerous goods may not be transported unless all applicable safety requirements are met, all applicable documents accompany the goods and the means of containment of the goods complies with applicable safety standards and displays required safety marks. An approved emergency response assistance plan must also be in place and the transporter of dangerous goods must be financially responsible. The Act also allows municipalities to make bylaws restricting the transportation of dangerous goods on highways under the municipality’s control. The Regulations adopt the federal *Transportation of Dangerous Goods Regulations* and establish requirements for review of stop orders and applications for permits.

(b) British Columbia

Nuclear substances are not listed in the definition of “waste” provided by British Columbia’s *Waste Management Act*⁶⁴ and radioactive dangerous goods are explicitly excluded from the definition of “special waste” by the *Special Waste Regulation*.⁶⁵ However, provisions within the *Special Waste Regulation* prohibit the disposal of radioactive wastes in a “secured landfill” or “long-term storage facility,” as defined by the Regulation.

British Columbia’s *Transportation of Dangerous Goods Act*⁶⁶ includes nuclear substances in its definition of “dangerous goods”. The Act requires that any instance of transportation of

⁶² R.S.A. 2000, c. D-4.

⁶³ Alta. Reg. 157/97.

⁶⁴ R.S.B.C. 1996, c. 482.

⁶⁵ B.C. Reg. 63/88.

⁶⁶ R.S.B.C. 1996, c. 458.

dangerous goods must comply with all applicable safety requirements including the display of applicable safety marks. The *Transport of Dangerous Goods Regulation*⁶⁷ adopts the safety requirements, standards and marks established by federal *Transportation of Dangerous Goods Regulation*.

Provisions of the *Workplace Hazardous Materials Information System Regulation (Mines)*⁶⁸ promulgated under the *Mines Act*⁶⁹ other than those addressing supplier labels and material data safety sheets do apply to materials and substances that fall within the federal *Hazardous Substances Act* discussed above. Requirements for worker education and training and information management defined by the *Workplace Hazardous Materials Information System Regulations (Mines)* may therefore apply to nuclear substances. However, substances that are being properly transported according to the federal *Transportation of Dangerous Goods Act* are specifically exempt from the scope of these legislative requirements.

(c) Manitoba

The *High-Level Radioactive Waste Act*⁷⁰ is the only piece of provincial legislation that specifically and exclusively addresses high-level radioactive waste. The definition of “high-level radioactive waste” in the Act includes:

- (a) spent nuclear reactor fuel, not intended for reprocessing or research, or
- (b) the highly radioactive liquid, whose radioactivity consists mainly of fission products, with some actinides also present, that are generated during chemical reprocessing of irradiated nuclear fuel (aqueous waste from the first solvent extraction cycle and those waste streams combined with it), or
- (c) any other waste with a radioactivity level comparable to clause (a) or (b).

The Act prohibits the storage of high-level radioactive waste that was produced outside of Manitoba. It is also expressly prohibited to establish facilities for the disposal of high-level radioactive wastes within the province, regardless of the jurisdiction of the waste’s origin.

While there is no reference to nuclear or radioactive wastes within Manitoba’s *Environment Act*,⁷¹ the Act’s definition of “waste” is broadly worded and open-ended and therefore may be

⁶⁷ B.C. Reg. 231/2002.

⁶⁸ B.C. Reg. 257/88.

⁶⁹ R.S.B.C. 1996, c. 293.

⁷⁰ C.C.S.M. c. R10.

⁷¹ C.C.S.M. c. E125.

interpreted to include nuclear waste. Radioactive materials are included in the definition of “special wastes” provided in the *Environment Act’s Litter Regulations*.⁷²

The *Dangerous Goods Handling and Transportation Regulation*⁷³ adopts the federal *Transportation of Dangerous Goods Regulations*, which includes nuclear substances that are radioactive in the definition of “dangerous goods.” Dangerous goods being transported must be properly packaged and identified in the required documentation. Compliance with safety requirements, standards and safety marks is also important. The transportation, storage, treatment and disposal of hazardous wastes require the possession of a valid licence issued under the province’s *Dangerous Goods Handling and Transportation Act*.⁷⁴ The Act also allows municipalities to make by-laws respecting the transportation of dangerous goods within the municipality’s boundaries.

Provisions of the *Workplace Hazardous Materials Information System Regulation*⁷⁵ and the *Workplace Health Hazard Regulation*⁷⁶ (both promulgated under the *Workplace Safety and Health Act*⁷⁷) other than those addressing supplier labels and material safety data sheets do apply to nuclear substances that fall within the federal *Hazardous Substances Act* discussed above. Requirements for worker education and training and information management defined by these Regulations may therefore apply to nuclear substances. Substances that are being properly transported according to the federal *Transportation of Dangerous Goods Act* are however excluded from the scope of the *Workplace Health Hazard Regulations*.

(d) New Brunswick

New Brunswick’s *Environmental Impact Assessment Regulation*,⁷⁸ promulgated under the *Clean Environment Act*,⁷⁹ requires facilities that process radioactive materials to be subject to environmental impact assessments. The addition of radioactive substances to water is defined as

⁷² Man. Reg. 92/88.

⁷³ Man. Reg. 55/2003.

⁷⁴ R.S.M. 1987, c. D12.

⁷⁵ Man. Reg. 52/88.

⁷⁶ Man. Reg. 53/88.

⁷⁷ R.S.M. 1987, c. W210.

⁷⁸ N.B. Reg. 87-83.

⁷⁹ R.S.N.B. 1973, c. C-6.

“water pollution” which is generally prohibited by the *Water Quality Regulation*⁸⁰ under the *Clean Environment Act*.

The *Transportation of Dangerous Goods Act*⁸¹ includes radioactive materials in the definition of “dangerous goods.” The proper transportation of dangerous goods requires compliance with applicable safety requirements, standards and safety marks. The safety requirements, standards and marks defined by the federal *Transportation of Dangerous Goods Regulation* are adopted by New Brunswick’s *Transport of Dangerous Goods Regulation*.⁸²

(e) Newfoundland and Labrador

Nuclear substances are included in the definition of “dangerous goods” in the *Dangerous Goods Transportation Act*.⁸³ Dangerous goods may not be transported unless all applicable safety requirements, standards are met and marks are affixed. The limitations placed on transportation of dangerous goods and safety requirements imposed by the federal *Transportation of Dangerous Goods Regulations* are adopted by the *Dangerous Goods Transportation Regulations*.⁸⁴

(f) Northwest Territories

The *Transportation of Dangerous Goods Act, 1990*⁸⁵ requires that all safety requirements and standards are complied with, all shipping documents are present and all safety marks are attached for the proper transportation of dangerous goods, which includes nuclear substances that are radioactive. The Minister may request the preparation of an emergency plan and the presentation of evidence that the person transporting dangerous goods is financially responsible for their activities. The Act gives municipalities the opportunity to make a by-law addressing the transportation of dangerous goods on highways within the municipality’s borders. The federal *Transportation of Dangerous Goods Regulations* are adopted by the Northwest Territories’ *Transportation of Dangerous Goods Regulations*.⁸⁶

⁸⁰ N.B. Reg. 82-126.

⁸¹ A.N.B. 1988, c. T-11.01.

⁸² N.B. Reg. 89-67.

⁸³ R.S.N.L. 1990, c. D-1.

⁸⁴ C.N.L.R. 5/96.

⁸⁵ S.N.W.T. 1990, c. 36.

⁸⁶ R-049-2002.

(g) Nova Scotia

The *Environmental Act*⁸⁷ defers to the Regulations to define “dangerous goods” and “dangerous waste goods” and also authorizes the Minister to designate such substances and regulate their management. The *Dangerous Goods Management Regulations*,⁸⁸ promulgated under the *Environmental Act*, note that any amount of radioactive material is characterized as a “dangerous good”. These Regulations also define storage requirements, necessary approvals and contingency plans and establish an offence for management of dangerous goods or waste management goods in a manner that may cause an adverse effect unless prior written approval of the Minister or an Administrator has been attained.

(h) Nunavut

Section 29(1) of the *Nunavut Act*⁸⁹ adopts legislation that was in effect in the Northwest Territories on April 1, 1999 when Nunavut was created. The *Transportation of Dangerous Goods Act, 1990* discussed above is therefore applicable in Nunavut as are the Northwest Territories’ *Transportation of Dangerous Goods Regulations*, which adopt the federal *Transportation of Dangerous Goods Regulations*.

(i) Ontario

The *General Waste Management Regulations*,⁹⁰ promulgated under the *Environmental Protection Act*,⁹¹ defines “radioactive waste” and includes radioactive waste in its definition of “hazardous waste”. Radioactive wastes that are disposed of in accordance with the CNSC or its predecessor, the AECB, are however expressly excluded from this definition. The *General Waste Management Regulations* are therefore applicable to radioactive wastes that are not disposed of in accordance with the CNSC or the AECB. The *Environmental Protection Act* requires approval of the Minister for the use and enlargement of waste management systems and waste disposal sites while standards for such systems and sites are prescribed in the *General Waste Management Regulations*.

Nuclear substances are not subject to the requirements for supplier and laboratory labels and material safety data sheets required by the *Workplace Hazardous Materials Information System*

⁸⁷ S.N.S. 1995, c. 1.

⁸⁸ N.S. Reg. 56/95.

⁸⁹ S.C. 1993, c. 28.

⁹⁰ R.R.O. 1990. Reg. 347.

⁹¹ R.S.O. 1990, c. E.19.

*(WHIMS) Regulation*⁹² promulgated under the *Occupational Health and Safety Act*⁹³ do not apply to nuclear substances although the remainder of this Regulation does apply to materials and substances that fall within the federal *Hazardous Substances Act* discussed above. Requirements for worker education and training and information management defined by these Regulations therefore may apply to nuclear substances. It should also be noted that substances that are being properly transported according to the federal *Transportation of Dangerous Goods Act* are excluded from the scope of the *Workplace Health Hazard Regulation*.

(j) Prince Edward Island

Section 1 of the *Environmental Protection Act*⁹⁴ defines “waste”, “waste management” and “waste treatment system” broadly and none of these definitions makes any specific reference to hazardous waste. “Hazardous waste” and “hazardous waste management facility” are however defined terms within the Act’s *Waste Resource Management Regulations*.⁹⁵ Nuclear substances are included in the Regulation’s definition of “hazardous waste” yet the remainder of the Regulation only addresses hazardous waste in the context of household hazardous materials and compost material classified as such.

Prince Edward Island’s *Dangerous Goods (Transportation) Act*⁹⁶ includes nuclear substances in the definition of “dangerous goods.” The transportation of dangerous goods requires compliance with safety requirements and standards, the accompaniment of all prescribed documentation and the display of all required safety marks. The *Dangerous Goods (Transportation) Act Regulations*⁹⁷ adopts the federal *Transportation of Dangerous Goods Regulations*.

(k) Quebec

Quebec’s *Environment Quality Act*⁹⁸ applies to “hazardous material” which is defined to include material that is radioactive. The properties of “radioactive material” are established in s. 3 of the Act’s *Regulation Respecting Hazardous Materials*.⁹⁹ Radioactive materials are excluded from

⁹² R.R.O. 1990, Reg. 860.

⁹³ R.S.O. 1990, c. O.1.

⁹⁴ R.S.P.E.I. 1988, c. E-9.

⁹⁵ EC2000-691.

⁹⁶ R.S.P.E.I. 1988, c. D-3.

⁹⁷ E.C. 319/85.

⁹⁸ R.S.Q., c. Q-2.

⁹⁹ c. Q-2, r. 15.2.

the portion of these Regulations that define a standard for the storage of residual hazardous materials. Radioactive materials that meet the requirements of a permit issued by the AECB (now the CNSC) are explicitly excluded from the entire Regulation as they are excluded from the definition of “hazardous materials” by s. 2(13) of the Regulations.

The transportation of dangerous goods in Quebec is addressed by the *Transportation of Dangerous Substances Regulations*,¹⁰⁰ which are promulgated under the province’s *Highway Safety Code*.¹⁰¹ These regulations adopt many of the provisions of the federal *Transportation of Dangerous Goods Regulations*, including the federal Act and Regulation’s designation of dangerous goods. Nuclear substances that are radioactive are therefore designated as dangerous goods for the application of Quebec’s Regulation. Other aspects of the federal Regulations that are adopted by the Quebec Regulation include safety requirements and standards, information required within shipping documents, the appearance of safety marks, the means of containment of dangerous substances during transport, the approval and implementation of an emergency response assistance plan and the duty to report accidental releases of dangerous substances.

(1) Saskatchewan

Pursuant to the *Dangerous Goods Transportation Act*,¹⁰² the transportation of dangerous goods requires compliance with safety requirements and standards and the display of proper safety marks. The Minister may also require the preparation of an emergency plan for implementation in the event of a discharge, emission or escape of dangerous goods. The *Dangerous Goods Transportation Regulations*¹⁰³ adopt the safety requirements of the federal *Transportation of Dangerous Goods Regulations*. Ambiguity exists in Saskatchewan’s Regulations regarding the adoption of the federal list of dangerous goods yet the federal definition of dangerous goods is applied in practice.

The *Radiation Health and Safety Act*¹⁰⁴ regulates limits of exposure to radiation and requires permits for related activities. The *Radiation Health and Safety Regulations*¹⁰⁵ clarify the scope of the Act and specifically note that the calculation of a dosage of radiation includes contributions from radioactive substances associated with operations licensed through the *Atomic Energy Control Act* (now licensed through the *Nuclear Safety and Control Act*).

¹⁰⁰ O.C. 866-2002.

¹⁰¹ R.S.Q. c. C-24.2.

¹⁰² R.S.S. 1984-85-86, c. D-1.2.

¹⁰³ R.R.S. 1984-85-86, c. D-1.2, r. 1.

¹⁰⁴ S.S. 1984-85, c. R.1.1.

¹⁰⁵ R.R.S., c. R-1.1, r. 1.

Summary of Provincial and Territorial Legislation

A variety of Provinces and Territories have legislation and regulations addressing nuclear substances.

Manitoba has adopted legislation that specifically and exclusively addresses high-level radioactive waste. The Act prohibits the storage of high-level radioactive waste that was produced outside of Manitoba. It is also expressly prohibited to establish facilities for the disposal of high-level radioactive wastes within the province, regardless of the jurisdiction of the waste's origin.

Almost all Provinces and Territories, including Alberta, British Columbia, Manitoba, New Brunswick, Newfoundland and Labrador, the Northwest Territories, Nunavut, Prince Edward Island and Quebec, include nuclear substances in the scope of legislation and regulations addressing the transportation of dangerous goods. Two notable exceptions are Nova Scotia and Ontario, both of which do not include radioactive materials included in Class 7 of the federal list of dangerous goods in the scope of the provincial legislation and regulations. Saskatchewan also defers to the federal list of dangerous goods in practice although the legislation and regulations are ambiguous with respect to the adoption of the federal list of dangerous goods provided by the *Transportation of Dangerous Goods Act, 1992*. The jurisdictions that do address nuclear substances also adopt various aspects of the federal *Transportation of Dangerous Goods Regulations* prescribing safety standards, marks and documentation requirements.

Some Provincial jurisdictions also include radioactive waste in the scope of legislation addressing waste management. For example, British Columbia's *Special Waste Management Act*, promulgated under the *Waste Management Act* prohibits the disposal of radioactive wastes in a "secured landfill" or "long-term storage facility," as defined by the Regulation. New Brunswick's *Environmental Impact Assessment Regulation*, promulgated under the *Clean Environment Act*, requires facilities that process radioactive materials to be subject to environmental impact assessments. New Brunswick also includes the addition of radioactive substances to water in the definition of "water pollution" which is generally prohibited by the *Water Quality Regulation* under the *Clean Environment Act*. Nova Scotia's *Dangerous Goods Management Regulations*, promulgated under the *Environmental Act*, note that any amount of radioactive material is characterized as a "dangerous good". These Regulations also define storage requirements, necessary approvals and contingency plans and establish an offence for management of dangerous goods or waste management goods in a manner that may cause an adverse effect unless prior written approval of the Minister or an Administrator has been attained.

Radioactive wastes that are disposed of in accordance with the CNSC or its predecessor, the AECB, are expressly excluded from Ontario's *General Waste Management Regulations*, which are promulgated under the *Environmental Protection Act*, as well as Quebec's *Regulation Respecting Hazardous Materials*, promulgated under the *Environmental Quality Act*. This leaves radioactive wastes that are not disposed of in accordance with requirements of the CNSC or the AECB subject to the regulatory requirements of these provinces.

Waste management legislation in other jurisdictions, including Manitoba, is broadly worded and open-ended and therefore may be interpreted to include nuclear waste.

Saskatchewan also addresses radioactive substances in the context of occupational health and safety through the *Radiation Health and Safety Act*, which regulates limits of exposure to radiation and requires permits for related activities.

PART VI – INTERNATIONAL TREATIES AND CONVENTIONS

An important characteristic of international law is the fact that this law is based on co-ordinated efforts among various sovereign states. Each sovereign state has its own domestic legal system pursuant to which it may implement its treaty obligations as it deems fit.

Once an international convention has entered into force, its terms become enforceable against its state parties. Enforcement may be carried out according to the convention's enforcement provisions. Since international instruments are signed on behalf of Canada by the Canadian government, it is only the Canadian government that may be held accountable for implementation.

Accordingly, it is the responsibility of the Canadian government to implement the terms and conditions of such international instruments into Canada's domestic legal regime. Only those international obligations that are incorporated into Canada's domestic law are legally binding upon individuals, corporations and organizations that are subject to Canadian law.

Canada is involved in a variety of international agreements that address nuclear waste management including (a) Joint Convention on the Safety of Spent-Fuel Management and on the Safety of Radioactive Waste Management, (b) The Convention on the Physical Protection of Nuclear Material, (c) Convention on Nuclear Safety, (d) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter, (e) The Antarctic Treaty, (f) Treaty on the Non-Proliferation of Nuclear Weapons, and (g) Agenda 21. While the scope of each of these international instruments as well as Canada's signatory status is discussed below, it is important to remember that legal obligations imposed by international instruments that have entered into force are only applicable to the signing country's government. Only those aspects of these international agreement that have been implemented into Canada's domestic law are relevant to persons other than the Canadian government.

- (a) Joint Convention on the Safety of Spent-Fuel Management and on the Safety of Radioactive Waste Management

The *Joint Convention on the Safety of Spent-Fuel Management and on the Safety of Radioactive Waste Management* falls under the auspices of the International Atomic Energy Agency (IAEA).

This international convention defines "radioactive waste" as "radioactive material in gaseous, liquid or solid form for which no further use is foreseen by the Contracting Party or by a natural or legal person whose decision is accepted by the Contracting Party, and which is controlled as radioactive waste by a regulatory body under the legislative and regulatory framework of the Contracting Party." "Spent fuel" is defined as "nuclear fuel that has been irradiated in and permanently removed from a reactor core."

According to the convention, Contracting Parties are required to take appropriate steps to ensure that all stages of spent fuel management (which includes storage, transportation and disposal) include appropriate steps to protect individuals, society and the environment against radiological

hazards. The safety of facilities used for spent fuel management must be considered prior to their construction and operation, and this must be done through an environmental assessment processes. Safety requirements for existing and future radioactive waste management facilities explicitly apply to disposal of radioactive wastes. Activities in the transboundary movement of spent fuel and radioactive waste must also comply with the conditions defined within the convention.

Canada ratified this agreement on May 7, 1998 and has been a Contracting Party since the convention came into force on June 18, 2001.

(b) The Convention on the Physical Protection of Nuclear Material

The Convention on the Physical Protection of Nuclear Material also falls under the auspices of the IAEA.

The safe transportation of nuclear materials is a requirement of *The Convention on the Physical Protection of Nuclear Material*. According to this convention, transportation of such materials should not be authorized unless it is established that the materials will be adequately protected during transport. The convention also addresses reporting requirements in the event of a breach of security resulting in theft, robbery or other unlawful taking of nuclear material and requires that the confidentiality of certain information be maintained. State Parties to the convention also agree to enforce criminal sanctions against those committing criminal offences involving nuclear materials.

Canada signed this convention on September 23, 1980 and deposited ratification on March 21, 1986 and has therefore been a Member State since the convention entered into force on February 8, 1987.

(c) Convention on Nuclear Safety

The Convention on Nuclear Safety also falls under the auspices of the IAEA.

While safety measures for “nuclear installations” that are established by the *Convention on Nuclear Safety* are stated to apply to storage, handling and treatment facilities for radioactive materials, the text of the convention makes no specific reference to disposal facilities. Despite the lack of reference to disposal facilities, the conditions contained in this convention may be important within a radioactive waste disposal scheme for the aspects that take place within existing facilities for storage, handling and treatment. The convention encourages the implementation of a legislative and regulatory framework addressing the safety of nuclear installations and the establishment of policies that give due priority to nuclear safety.

Canada signed this convention on September 20, 1994 and deposited ratification on December 12, 1995 and has therefore been a Contracting Party to this convention since it entered into force on October 24, 1996.

(d) Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter

The Secretariat of the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* is the International Maritime Organization.

While dumping radioactive wastes was never allowed under the terms of this convention, its text was amended in 1993 to explicitly include radioactive wastes and other radioactive matter in the scope of its prohibition of ocean disposal. This was accomplished through the amendment of Annexes I and II to the convention to ban the dumping of all radioactive wastes. This amendment entered into force on February 20, 1994 and remains in force to date.

Efforts have been focused on replacing this convention with the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* (“Protocol”), which also prohibits dumping of radioactive material. Although it is not yet in force, it is interesting to note that the prohibition on the dumping of radioactive waste and other matter is reflected in Article 4 and Annex I of the Protocol. Article 4 of the Protocol requires Contracting Parties to prohibit the dumping of all wastes and other matters with the exception of those listed in Annex I. Radioactive waste and other radioactive matter is not included in the list of waste and matter that may be considered for dumping provided in Annex I. In addition, any levels of radioactivity greater than *de minimus* (as defined by IAEA and adopted by the Contracting Parties) that are found in Annex I materials that may be considered for dumping will negate the opportunity to consider the waste or matter for dumping.

Dumping is defined in Article 1 of the Protocol as (1) any deliberate disposal into the sea of wastes or other matter from vessels, aircraft, platforms or other man-made structures at sea; (2) any deliberate disposal into the sea of vessels, aircraft, platforms or other man-made structures at sea; (3) any storage of wastes or other matter in the seabed and the subsoil thereof from vessels, aircraft, platforms or other man-made structures at sea; and (4) any abandonment or toppling at site of platforms or other man-made structures at the sea, for the sole purpose of deliberate disposal. “Sea” is defined in Article I as “all marine waters other than the internal waters of States, as well as the seabed and the subsoil thereof, it does not include sub-seabed repositories accessed only from land.”

Annex I to the Protocol also requires the Contracting Parties to the convention to complete scientific studies at 25-year intervals to review the validity of the prohibition imposed on radioactive waste and other radioactive matter. This review however is required for all radioactive wastes and other radioactive matter other than high-level wastes or matter.

Canada signed this convention on December 29, 1972 and ratified the convention on November 13, 1975, shortly after it entered into force internationally on August 13, 1975. Although the Protocol has not yet entered into force, the date of Canada’s accession of the Protocol was May 15, 2000.

(e) The Antarctic Treaty

The Antarctic Treaty entered into force on June 23, 1961 and has since been supplemented by over 200 recommendations and five separate international agreements¹⁰⁶ through efforts of the party nations with consultative status.

Article V of *The Antarctic Treaty* clearly prohibits the disposal of radioactive waste material in the Antarctic.

Canada is a non-consultative party to the treaty – it has acceded to its terms and may attend consultative meetings as an observer.

(f) Treaty on the Non-Proliferation of Nuclear Weapons

The *Treaty on the Non-Proliferation of Nuclear Weapons* also falls under the auspices of the IAEA.

As a Non-Nuclear Weapon State Party of the Treaty on the Non-Proliferation of Nuclear Weapons, Canada has agreed to (a) refuse to receive any nuclear weapons or nuclear explosive devices, (b) not acquire nuclear weapons or other nuclear explosive devices and (c) not seek or receive assistance in the manufacture of nuclear weapons or other nuclear explosive devices. Non-Nuclear Weapon State Parties are required to strike agreements with the IAEA for the implementation of required safeguards.

Through the terms of the *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, Canada agreed to provide adequate information about nuclear substances within the country to verify that these materials are not diverted to nuclear weapons or other nuclear explosive devices. According to Article 8 of the agreement, information concerning nuclear material subject to safeguards under the treaty and the features of facilities relevant to safeguarding such material is to be provided to the IAEA. Measures for accounting and control of nuclear material subject to safeguards include the following:

- (a) a measurement system for the determination of the quantities of nuclear material received, produced, shipped, lost or otherwise removed from inventory, and the quantities on inventory;
- (b) the evaluation of precision and accuracy of measurements and the estimation of measurement uncertainty;

¹⁰⁶ *Agreed Measures for the Conservation of Antarctic Fauna and Flora* (1964), *Convention for the Conservation of Antarctic Seals* (1972), *Convention on the Conservation of Antarctic Marine Living Resources* (1980), *Convention on the Regulation of Antarctic Mineral Resource Activities* (1988), and *Protocol on Environmental Protection to the Antarctic Treaty* (1991).

- (c) procedures for identifying, reviewing and evaluating differences in shipper/receiver measurements;
- (d) procedures for taking physical inventory;
- (e) procedures for the evaluation of accumulations of unmeasured inventory and unmeasured losses;
- (f) a system of records and reports showing, for each material balance area, the inventory of nuclear material and the changes in that inventory including receipts into and transfers out of the material balance area;
- (g) provisions to ensure that the accounting procedures and arrangements are being operated correctly; and
- (h) procedures for the submission of reports to the IAEA¹⁰⁷ including initial reports, inventory change reports and material balance reports.¹⁰⁸

The IAEA must also receive advance notification of intended transfers of nuclear material out of and into Canada and must be informed of intended uses of nuclear material subject to safeguards, including uses of such material that do not require the application of safeguards.

The agreement between Canada and the IAEA has been simplified through the adoption of a *Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*. Some examples of information that Canada must provide to the IAEA include a description of the location of nuclear fuel cycle-related research and development activities and the location and operational status and estimated production capacity of uranium mines and concentration plants and thorium concentration plants. The protocol also provides a reporting schedule and grants the IAEA complimentary access to locations within Canada that noted in submitted reports.

It is clearly noted that the provisions of the Treaty do not affect the right of each Party to conduct research and develop nuclear energy for peaceful purposes. The Treaty allows the sharing of any identified potential benefits from peaceful applications of nuclear explosions.

The *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* entered into force on February 21, 1972. On September 8, 2000, this agreement was amended when the *Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* came into force.

¹⁰⁷ *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*, Article 32.

¹⁰⁸ *Ibid.*, Article 63.

(g) Agenda 21

Agenda 21 was signed by Participating Countries at Rio de Janeiro's Earth Summit, which was held from June 3rd through the 14th in 1992. When signed, this international instrument had a mandate to promote environmentally sound economic development.

Chapter 22 of Agenda 21 addresses the safe and environmentally sound management of radioactive wastes, which includes transportation, storage and disposal activities. The goal of the programme implemented by Chapter 22 is "to protect human health and the environment, within a wider framework of an interactive and integrated approach to radioactive waste management and safety." Activities encouraged through the programme include:

- the promotion of policies and measures to minimize the generation of radioactive wastes and provide for safe processing, conditioning, transportation and management;
- support IAEA efforts to develop and promulgate internationally accepted radioactive waste safety standards or guidelines and codes of practice;
- promote safe storage, transportation and disposal of radioactive wastes and spent radiation sources, in developing countries in particular, by facilitating the transfer of relevant technologies;
- promote proper planning prior to and after radioactive waste generating activities;
- implement international instruments addressing radioactive waste management; and
- promote and conduct related research and development initiatives.

Canada was a Participating Country of the Earth Summit and was therefore a signatory to *Agenda 21*. Canada has adopted *Agenda 21* and pledged to consider the programmes, strategies and plans encouraged within it when developing and implementing schemes for domestic economic development.

Summary of International Treaties and Conventions

Canada has ratified a number of international treaties and conventions that address the management of radioactive waste and nuclear substances. Those that have come into force since Canada's ratification include the *Joint Convention on the Safety of Spent-Fuel Management and on the Safety of Radioactive Waste Management*, *The Convention on the Physical Protection of Nuclear Material*, the *Convention on Nuclear Safety* and the *Treaty on the Non-Proliferation of Nuclear Weapons*. Canada has also ratified the *Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* and has acceded to the *1996 Protocol to the Convention on the Prevention of Marine Pollution by Dumping of Wastes and Other Matter* yet at the time of writing, only the Convention had entered into force. Canada is also a non-consultative party to *The Antarctic Treaty*.

The terms of the treaties and conventions that have entered into force are enforceable against their state parties but it is only the Canadian government that may be held accountable for the implementation of these terms. Accordingly, it is the responsibility of the Canadian government to implement the terms and conditions of such international instruments into Canada's domestic legal regime. Only those international obligations that are incorporated into Canada's domestic law are legally binding upon individuals, corporations and organizations that are subject to Canadian law.

For example, one of the stated purposes of the *Nuclear Safety and Control Act* is the implementation of international measures that Canada has agreed to that address the development, production and use of nuclear energy. Accordingly, many of the Regulations promulgated under the *Nuclear Safety and Control Act* address issues that are the subject of international treaties and conventions. For example, the *Nuclear Non-Proliferation Import and Export Control Regulations* promulgated under the *Nuclear Safety and Control Act* address issues included in *The Convention on the Physical Protection of Nuclear Material*. A series of regulations promulgated under the *Nuclear Safety and Control Act* address issues included in the scope of the *Treaty on the Non-Proliferation of Nuclear Weapons* including the *Class I Nuclear Facilities Regulations*, the *General Nuclear Safety and Control Regulations*, and the *Nuclear Non-Proliferation Import and Export Control Regulations*.

PART VII – COMPARATIVE LAW

Other countries that are considering high-level nuclear waste disposal options include Belgium, Finland, France, Germany, Japan, Spain, Sweden, Switzerland, the UK and the US. Below are brief sketches of the regulatory frameworks in each of those countries.

Belgium

The Federal Agency for Nuclear Control (FANC), established in 1994, is the body that oversees nuclear safety, including waste safety, in Belgium. To that end, FANC drafts and enforces laws and regulations. It also grants licences for nuclear facilities and monitors licence-holders to ensure they obey all applicable conditions. Responsibility for managing nuclear waste, including waste transport and interim and long-term storage, rests with the National Agency for Radioactive Waste and Enriched Fissile Materials (ONDRAF/NIRAS), established in 1980.

The two main laws governing nuclear waste are the Law of April 15, 1994 (as amended), which outlines the overall regulatory framework and the role of FANC, and the Law of August 8, 1980 (as amended), which defines the role of ONDRAF/NIRAS.

Applications for a FANC licence to dispose of nuclear waste require a safety analysis report as well as an environmental impact assessment report. FANC also consults with its scientific committee and the local authorities. The final decision on an application is issued as a royal decree. To date, FANC has not licensed any facilities for the final disposal of waste. Rather, it has only approved facilities for the interim management of waste.

ONDRAF/NIRAS is currently examining the deep geological disposal (in clay) of high-level nuclear waste. To this end, an underground laboratory, the High Activity Disposal Experimental Site (HADES), has been built. Construction of a disposal facility will not begin until 2025, at the earliest. The related siting and licensing processes have yet to begin.

Finland

According to Finland's *Nuclear Energy Act*, all spent fuel from Finnish nuclear power plants is required to be handled, stored, and permanently disposed of in Finland. The Act also prohibits the import of nuclear waste. The framework for final disposal is set out in two regulations, the Government Decision on the Safety of Disposal of Spent Fuel and the Decision of the Council of State on the General Regulations for the Safety of a Disposal Facility for Reactor Waste.

STUK is Finland's Radiation and Nuclear Safety Authority and is therefore responsible for the safe use of nuclear energy in Finland. Plans for nuclear management operations must be approved by STUK. Companies responsible for nuclear energy in Finland have joined efforts to establish a joint company responsible for the research and development of the concept and

practice of geologic disposal of spent nuclear fuel. This company will also be responsible for the construction and operation of the disposal facility.

Before any significant investment can be made in a nuclear facility in Finland, both a “Decision-in-Principle” and an environmental impact assessment are required by law. The permission of the local municipal council is also required.

Chosen from an initial group of five potential site locations, Olkiluoto, an island off of the west coast in the municipality of Eurajoki, has been approved as the designated site for the final repository of Finland’s spent nuclear fuel. This approval has been obtained through the issuance of a Decision-in-Principle and has been ratified by the Finnish government. The application for the Decision-in-Principle was based on twenty years of research and investigations and the conclusions of an environmental impact assessment with the objective of considering different alternatives and encouraging participation of stakeholders. Two separate appeals of the Eurajoki municipal council’s decision to approve the site were rejected by the Supreme Court of Administration. The facility is scheduled to begin receiving waste in the 2020s.

France

The jurisdiction to regulate nuclear safety and radiation protection in France has recently been reformed and is now the responsibility of L’Institut de radioprotection et de surete nucleaire.

The country’s national energy policies are currently under review through a national energy debate launched by government. Among the issues under consideration are the solutions that must be adopted for processing and disposing of nuclear waste. Information gathered during organized debates will be implemented into a new energy bill expected to be submitted to Parliament in late 2003.

The current nuclear waste management regulations in France require operations to be licensed, which includes consideration of waste management and decommissioning plans. French law also requires the producers of nuclear waste to fund the eventual disposal of such waste at a facility that is approved by the government. Research is currently underway to identify the optimal site for France’s repository for high-level nuclear waste.

France is known for its research efforts as pursued by the country’s national radioactive waste management agency, Agence Nationale pour la Gestion des Dechets Radioactifs (ANDRA). ANDRA’s responsibility for conducting research was defined by the *French Waste Management Research Act* which was adopted in 1991. This legislation charged ANDRA with investigating three options for the disposal of high-level radioactive waste: reversible or irreversible disposal in a geological formation, separation and/or transmutation, and long-term surface storage. ANDRA’s research will be completed by 2006, at which time the French government will chart a disposal strategy.

Germany

Under Germany's Basic Law, the federal government has jurisdiction over nuclear energy and the disposal of nuclear waste, but the *Länder* administer the federal rules. Thus, although the *Länder* are responsible for licensing the construction, operation, modification and decommissioning of nuclear installations including disposal sites, they are supervised in this capacity by the federal government.

The *Atomic Energy Act* lays out the regulatory framework for nuclear power, including the licensing requirements for the construction and operation of a waste repository. Under this scheme, the German Company for the Construction and Operation of Repositories for Wastes (DBE), through an exclusive contract with the Federal Office for Radiation Protection (BfS), is in charge of the construction and operation of nuclear waste repositories. The BfS performs a "self-surveillance" role with respect to its disposal facilities. It is ultimately accountable to the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

In 2002, the federal government passed the *Act on the Phase-Out of Nuclear Power*, which prohibits the construction of new nuclear power plants and mandates the gradual decommissioning of existing plants. The Act bans the delivery of nuclear waste for the purpose of reprocessing as of mid-2005. Thereafter, only direct disposal will be allowed. The government plans to build a permanent repository in a deep geological formation by 2030 for the disposal of all types of nuclear waste. In December of 2002, a working group established by the Environment Minister recommended a number of procedural steps for selecting a location for this repository, including ways to incorporate public input. A formal siting process is expected to be in place by 2005, at which point the evaluation of potential sites can begin.

Japan

The *Specified Radioactive Waste Final Disposal Act*, adopted in June of 2000, specifies an overall implementation scheme for Japan's disposal of radioactive waste. The Act requires the Japanese government to set the basic policy and final disposal plan on a continuing basis. The Japanese government is also responsible for supervising the activities of the Nuclear Waste Management Organization (NUMO) and the Radioactive Waste Management Funding and Research Center (RWMC). NUMO is responsible for the selection of a repository site for Japan's high-level radioactive waste, the demonstration of disposal technology at the site, all relevant licensing applications and the construction, operation and closure of the repository. While making progress towards fulfilling these responsibilities, especially the process of site-selection, the NWMO's activities will be open to the public. Considerations of safety and security have been identified as top priorities throughout the decision-making process. The producers of Japan's high-level nuclear waste are responsible for sharing the costs associated with the final disposal of this waste in Japan. The owners of nuclear power plants are therefore required to contribute to an assigned fund that will be managed by the RWMC.

Safety regulations related to the disposal of Japan's high-level nuclear waste have been addressed by the Advisory Committee on Radioactive Waste Safety Regulations of Nuclear

Safety Commission of Japan (NSC). Final safety guidelines required for a license application are expected to be issued later in the process.

Spain

The Spanish Government's Radioactive Wastes General Plan, as adopted in July 1999, established that no decisions would be made about the final management of high-level radioactive waste until the year 2010. In the meantime, the Empresa Nacional de Residuos Radiactivos, S.A. (ENRESA), a public company responsible for the management of radioactive nuclear waste produced in Spain, is continuing to set up all necessary techniques and methodologies for deep geological disposal.

Sweden

Sweden's nuclear fuel and waste management company (SKB) was formed by the owners of nuclear power plants as a result of their legislated responsibility to manage and dispose of all radioactive waste safely. The SKB's responsibilities included the planning, construction, ownership and operations of the systems and facilities necessary for transportation, interim storage and final disposal of Sweden's high-level radioactive waste. These activities are financed through a fund also established by the owners of nuclear power plants. Reactor licensees make payments to the state (set fee/kilowatt hour). This cost is essentially passed on to the energy consumer, as it is included in the energy fees charged.

Spent nuclear fuel and other high-level radioactive wastes are currently stored in the country's Central Interim Storage Facility for Spent Nuclear Fuel while research efforts are focused on site investigations.

Efforts of the SKB are combined with the Swedish Nuclear Power Inspectorate (SKI) and the Swedish Radiation Protection Institute (SSI). The SKI works to ensure that spent nuclear fuel and nuclear waste are stored safely. A principle of this body is the idea that the public health of future generations and the environment they live in must not be exposed to greater risks than is the case today. The SSI is responsible for ensuring that the harmful effects of radiation on people and the environment in Sweden are as small as possible.

Following the SKI's recommendation, the Swedish government has endorsed in principle the disposal of high-level waste in bedrock 500 metres underground. Before such a facility can be approved, however, the SKB must find an appropriate site and conduct further analysis of any possible safety and environmental impacts. According to the *Act on Nuclear Activities* and the *Environmental Code*, the SKI will appraise the SKB's safety assessment and Environmental Impact Statement. Under the *Radiation Protection Act*, the SSI will assess whether the proposal might expose workers, citizens or the environment to radiation. The SKB's application will then be reviewed by an environmental tribunal with a public hearing, according to the *Environmental Code*. The municipality where the proposed depository is sited may veto the project, although

the national government may override such a veto. The final decision on whether to issue the SKB a licence to build a repository lies with the national government. The SKB plans to submit an application for such a licence in 2007.

Switzerland

Under the Swiss constitution, jurisdiction for nuclear power and nuclear waste disposal rests with the federal government. Research addressing the safe disposal of radioactive wastes in Switzerland is the responsibility of the National Cooperative for the Disposal of Radioactive Waste (Nagra). This company was established by Switzerland's producers of radioactive waste as they are responsible for the safe management and disposal of such wastes. Nagra's research and development activities are funded by its members while present and future waste management costs are included in the price of electricity.

In its aim to safely isolate all radioactive wastes until they are no longer a hazard, the tasks that Nagra is responsible for include preparing inventories of radioactive wastes, planning repositories for disposal, conducting investigations on potential repository sites, demonstrating the safety of disposal mechanisms, promoting international collaboration and advising third parties. A report of Nagra's feasibility study was submitted to Switzerland's federal safety authorities in December of 2002 including siting demonstration, demonstration of engineering feasibility and safety demonstration.

Switzerland is currently contemplating a reform of the country's legislation addressing nuclear waste management, which has halted progress in the development of a plan for the establishment of a disposal facility. In a national referendum held in June of 2003, voters rejected two proposals that would have phased out all five nuclear power plants and extended a ten-year moratorium on new reactors.

United Kingdom

Nirex was established by the nuclear industry in order to examine the safe, environmental and economic aspects of deep geological disposal of radioactive waste. The option of deep geological disposal of the UK's radioactive waste is currently under review, as is the government's policy on radioactive waste management. Nirex remains responsible for advising producers of radioactive wastes on how radioactive wastes should be packaged. Nirex also monitors the producers of radioactive waste for adequate records and the proper immobilization of radioactive wastes.

United States of America

American efforts have been focused on the development of a central repository for spent nuclear fuel and defense-related high-level radioactive waste, which is now stored at 131 temporary

facilities in 39 states. In 1987, the U.S. Congress amended the *Nuclear Waste Policy Act* (“*NWPA*”), instructing the Department of Energy to study only one possible site: Yucca Mountain in Nevada. In February of 2002, President George W. Bush endorsed the Yucca Mountain site. The state of Nevada exercised its right under the *NWPA* to veto the siting decision, but its veto was in turn overridden by both houses of Congress. The Department of Energy (DOE) is now preparing an application for a licence from the Nuclear Regulatory Commission (NRC) to build the facility. Public participation is expected to continue throughout the consideration of the proposed disposal site. Studies and assessments are proceeding with the goal to safeguard the health and safety of current populations, future generations and the environment with a strong emphasis on safety and environmental considerations. Indeed, once the DOE submits the application to build the Yucca Mountain repository, the NRC review process is expected to take at least three years. The NRC will monitor both the construction and the operation of the facility. After construction is completed, the DOE will be required to apply for another licence before the site may receive waste.

American efforts to address the long-term management of radioactive waste taken to date and in the future have and will be effectively funded by electricity consumers as a fee included in electricity tariffs (0.1 cents/kilowatt hour) which is paid directly into a fund for radioactive waste management.

Summary of Comparative Law

Canada is not alone in the development of an approach to the management of high-level nuclear waste. The regulatory frameworks implemented in other countries that are considering high-level nuclear waste disposal options provide an international context for Canada’s undertaking as well as insight into alternative ways and means of proceeding.

CONCLUSIONS – THE FINDINGS OF THIS BACKGROUND PAPER

The legal and administrative arrangements governing the nuclear energy industry have evolved considerably since its inception in the era immediately following World War II. We now have a relatively mature legal regime that regulates the industry both through laws of general application and through specifically focused regulations, policies and license provisions.

The premise of our nuclear regulatory regime is one of risk management. The concept of risk management is central to the *Nuclear Safety and Control Act* and is in fact articulated in its statement of purpose. The balancing of risks and benefits is also a critical aspect of the statutory mandate of the Nuclear Waste Management Organization.

The management of risks is the foundation of the regulations governing the various aspects of the enterprises and undertakings of the nuclear industry, from facility licensing to the regulations governing the transportation of nuclear substances. Among the risks identified are those to public health, safety and the environment, as well as those to Canada's security.

This paper has reviewed the legislation relevant to nuclear waste management in Canada. It is comprised of federal and provincial laws of general and specific application as well as legislation which confers substantial decision-making discretion upon an administrative tribunal, the Canadian Nuclear Safety Commission, whose licensing authority pursuant to the *Nuclear Safety and Control Act* is central to the implementation of any nuclear waste management approach.

Canada does not regulate its nuclear industry in isolation from other nations. Canada is a signatory to international treaties that provide a general framework of considerations within which the country is committed to operate. For example, Canada is a signatory to the *Joint Convention on the Safety for Spent Fuel Management and on the Safety of Radioactive Waste Management* ("Joint Convention").

Canadian law in this field has evolved to include a commitment to transparency and public participation. This is reflected in the mandates of both the Nuclear Waste Management Organization and the Canadian Nuclear Safety Commission. This commitment to the public is indeed a component of the Joint Convention.

The implementation of a nuclear waste management approach will entail adherence to laws that will impose both positive duties of compliance as well as laws that will subject the implementation of the approach to regulatory scrutiny and the application of regulatory discretion. Understanding those obligations and the criteria to be applied is critical at the earliest stages of a project. Accordingly, as the process of planning proceeds, it is essential to understand the prescribed regulatory path associated with each of the alternatives under consideration.

The foregoing is an overview of Canadian law and administrative arrangements, with a brief comparative jurisdiction discussion for reference. Of course, virtually every aspect of this paper can be explored to considerably greater detail. However, it is hoped that the foregoing review will provide the Nuclear Waste Management Organization with sufficient context so as to be of assistance to it in the exercise of its mandate.

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