Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Draft Environmental Assessment Guidelines (Scope of Project and Assessment)

Environmental Assessment of Proposed Modifications to Hydro Québec`s Gentilly-2 Radioactive Waste Management Facilities

Prepared by the Canadian Nuclear Safety Commission
February 2002

Canada

TABLE OF CONTENTS

1.0 PURPOSE

The purpose of this document is to provide guidance on the scope of the environmental assessment (EA) that will be conducted in relation to proposed modifications to the Gentilly radioactive waste management facilities. These modifications are needed to manage radioactive components and waste arising from plant refurbishment project activities at the Gentilly-2 Nuclear Generating Station (NGS).

A federal environmental assessment is required under the provisions of the *Canadian Environmental Assessment Act* (CEAA). Under the CEAA, the scope of the project and the scope of the factors included in the assessment are determined by the responsible authority (RA), in this case, the Canadian Nuclear Safety Commission (CNSC).

The Quebec Department of the Environment (MENV) has advised CNSC staff that the proposed refurbishment of the Gentilly NGS, including the modifications necessary for the management of radioactive waste, must be subject to the environmental impact assessment and review procedure as set out in sections 31.1 et seq. of the Quebec *Environment Quality Act* and in section 2(m) of the *Regulation Respecting Environmental Impact Assessment and Review*. MENV has already provided Hydro-Québec with a directive from the Minister indicating the nature, scope and extent of the impact study that it must conduct to meet the requirements of this process.

CNSC and MENV staff have agreed, insofar as possible, to use the same impact study in order to conduct the assessments required by the federal and provincial governments.

The EA Guidelines describe the basis for the conduct of the federal EA and focus the assessment on relevant issues and concerns. This document also provides specific direction to the proponent, Hydro-Québec, on how to document the technical environmental assessment study which will be delegated to them by CNSC staff pursuant to subsection 17(1) of the CEAA. Finally, the Guidelines provide a means of communicating the environmental assessment process to stakeholders.

2.0 BACKGROUND

Hydro-Québec possesses a licence (PEID-W4-319-11.00/2003) issued by the CNSC which authorizes it to operate the Radioactive Waste Management Facility (RWMF) and Used Fuel Dry Storage Facility (UFDSF), located within the exclusion zone of the Gentilly-2 NGS, as a Class IB Nuclear Facility under the *Nuclear Safety and Control Act* (NSCA). Hydro-Québec also possesses a licence (PERP 10.00/2006) issued by the CNSC which authorizes it to operate the Gentilly-2 NGS, located in the Gentilly district of the town of Bécancour, in the county of Nicolet, as a Class IA Nuclear Facility under the NSCA.

Hydro-Québec has notified the CNSC that it plans to carry out modifications to the radioactive waste and used fuel storage facilities in order to meet the operational requirements until 2013 (end of the useful life of the station) and following the extension of the useful life of the reactor caused by the proposed refurbishment work at the Gentilly-2 NGS.

The refurbishment of the NGS will generate a significant volume (approximately 1,300 m^3) of radioactive waste which will have to be stored in new storage units. According to the design basis scenario identified by Hydro-Québec in the Project Description, the operation of the NGS until 2035 will require the construction of a new waste management area and an increase in storage capacity of the UFDSF. The new waste management area is necessary to receive the solid radioactive waste produced by the proposed refurbishment and by the extension of the operation of the NGS until 2035. This new storage facility will occupy an area of approximately 100 m x 100 m and will be identified by the acronym SRWMF (Solid Radioactive Waste Management Facility). It will be built near the UFDSF and will be located within fenced areas and within the exclusion zone of the NGS.

The storage capacity of the UFDSF authorized by the Atomic Energy Control Board (AECB) in 1994 will have to be modified in order to meet the future storage needs created by the extension of the operation of the NGS until 2035. Initially, the construction of 16 CANSTOR modules in the UFDSF was authorized following a public review by a Canada/Quebec environmental assessment commission created under the *Environmental Assessment and Review Process Guidelines Order* (EARPGO) and section 2 of the *Rules of procedure relating to the conduct of public hearings* of the Quebec Bureau des audiences publiques sur l'environnement (BAPE). This public review ended in 1994. However, if the extension of the useful life of the NGS until 2035 is approved, Hydro-Québec plans to build 20 CANSTOR modules within the area initially authorized, i.e. 4 CANSTOR modules more than the 16 which were approved following this review.

The main activities of the proposed refurbishment are the replacement of the pressure tubes, the calandria tubes and the feed tubes. Of these activities, only those which produce waste to be stored in radioactive waste storage facilities will be considered in the environmental assessment. The NGS refurbishment, expected to take 18 months to complete, would begin in April 2008 and end in September 2009. The construction work on the SRWMF will take place in 2006 and 2007, so as to be completed in time to receive the radioactive waste generated by the operation of the station and by the proposed refurbishment, which will begin in April 2008.

If the CNSC approves the application, it will be necessary to amend the current licence, pursuant to subsection 24(2) of the NSCA.

The environmental assessment, to be completed in accordance with the CEAA, will provide part of the information that the CNSC will use in considering Hydro-Québec's application with respect to the modifications required to the radioactive waste and used fuel storage facilities.
The application will also be subjected to a thorough evaluation under the provisions of the NSCA and its regulations. That includes a detailed safety review as part of the CNSC licensing process which provides the public with opportunities to provide input to the Commission prior to any licensing decision on the operation of the radioactive waste and used fuel storage facilities.
The RWMF licensing application does not pertain to the operations of the Gentilly-2 NGS.

3.0 APPLICATION OF THE *CANADIAN ENVIRONMENTAL ASSESSMENT ACT*

The CNSC staff has determined, pursuant to paragraph 5(1)(d) of the CEAA, that a federal environmental assessment is required before the CNSC can provide Hydro-Québec with an authorization to construct and operate new storage facilities intended for the management of radioactive waste generated by the current activities, the refurbishment work and operation extension at the Gentilly-2 NGS. The CNSC is the responsible authority under CEAA for the purposes of the assessment.

With the promulgation of the NSCA, amendments to the regulations under the CEAA are needed to replace references to the *Atomic Energy Control Act* and its regulations by appropriate reference to the provisions of the NSCA. Pending completion of the amendment process by the Canadian Environmental Assessment Agency (Agency), section 44 of the *Interpretation Act* deems references to the former legislation to be references to the analogous provisions of the NSCA.

In this case, the former provision authorizing the amendment of the RWMF and IFSDF operating licence was section 27(1) of the *Atomic Energy Control Regulations*, which is listed as a 'trigger' for an environmental assessment under the *Law List Regulations* of the CEAA. Applying the NSCA in analogous fashion, the amendment to the operating licence for the RWMF and UFDSF at the Gentilly-2 nuclear complex is a 'trigger' for the CEAA under the *Law List Regulations*.

There are no other CEAA 'triggers', such as funding, being a proponent or disposing of an interest in land to support the proposed project, that involve the CNSC.

The amendment to the waste facilities operating licence necessary to carry out the proposed modification of the radioactive waste storage facilities concerns the authorization of activities related to two types of work, namely the construction and operation of new radioactive waste storage facilities and the construction of 4 additional CANSTOR modules for the UFDSF; thus there are two 'projects' for the purposes of the CEAA. In addition, although the construction of 16 CANSTOR modules in the UFDSF was the subject of an environmental assessment in 1993, the need to build 4 additional modules, bringing the total to 20 CANSTOR modules, constitutes a project which is not identical to the operation which was the subject of a previous environmental assessment. There are therefore no identified exclusions from environmental assessment for the project pursuant to section 7 of the CEAA and section 2, Part I, Schedule I of the *Exclusion List Regulations* of the CEAA.

Accordingly, CNSC's authorization of the construction work on the SRWMF and 4 additional CANSTOR modules in the UFDSF will require that a federal environmental assessment be conducted pursuant to the CEAA.

The project is not of a type identified in the *Comprehensive Study List Regulations* of the CEAA. At this time, CNSC staff is not aware of any potential environmental effects or public concerns associated with this project which would warrant a need to have it referred to a mediator or review panel pursuant to section 25 of the CEAA. Thus, pursuant to subsection 18(1) of CEAA, the CNSC is required to ensure that a screening of the project is conducted and that a screening report is prepared before the proposed licensing decision can be made pursuant to the NSCA.

4.0 APPLICATION OF THE QUEBEC *REGULATION RESPECTING ENVIRONMENTAL IMPACT ASSESSMENT AND REVIEW*

As a corporation whose sole shareholder is the Quebec government, Hydro-Québec is subject to the environmental impact assessment and review procedure as set out in sections 31.1 et seq. of the Quebec *Environment Quality Act* and in section 2(m) of the Quebec *Regulation respecting environmental impact assessment and review*. Consequently, Hydro-Québec will have to conduct an impact study in response to a directive which it received from the Minister of the Environment in March 2002.

5.0 CO-OPERATIVE FEDERAL-PROVINCIAL ENVIRONMENTAL ASSESSMENT PROCESS

Since there is no environmental assessment co-operation agreement between the federal and Quebec governments, the federal and provincial procedures will both have to be carried out. However, CNSC and MENV staff have agreed, insofar as possible, to use the same impact study in order to conduct the assessments required by the federal and provincial governments.

Every effort will be made to allow the two parties to co-ordinate the public announcement of the decision they have reached in application of their respective legislation.

6.0 IDENTIFICATION OF OTHER FEDERAL AND PROVINCIAL EXPERT DEPARTMENTS

The CNSC is the only responsible authority under the CEAA that has been identified for this screening.

Pursuant to the *Federal Coordination Regulation* made under the CEAA, Environment Canada (EC), Fisheries and Oceans Canada (DFO), Health Canada (HC), Natural Resources Canada (NRCan) and Indian and Northern Affairs Canada (INAC) have been notified of the proposed project, and have been requested to make a determination of their role, either as a responsible authority (RA) or an expert federal authority (FA).

EC, DFO, HC and NRCan have indicated that they are not responsible authorities pursuant to CEAA, but that they wish to participate in the environmental assessment process as expert federal authorities. INAC has indicated they do not have a role in the assessment, but that they would like the Abenakis of Wôlinak consulted during the process.

7.0 DELEGATION OF TECHNICAL ASSESSMENT STUDIES TO HYDRO-QUÉBEC

The CNSC, pursuant to subsection 17(1) of the CEAA, will delegate to Hydro-Québec the preparation of technical support studies for the environmental assessment which CNSC staff will require to prepare their screening report. In addition, the CNSC delegates to Hydro-Québec the development and implementation of a public consultation program.

Once the impact study and the technical support studies have been completed by Hydro-Québec, they will be submitted to CNSC staff, who will distribute them to the CNSC technical experts and to the federal and provincial authorities for technical review. Following this technical review, the impact study will be finalized by Hydro-Québec and used by CNSC staff for the preparation of a draft screening report which will be made public for review and comment.

The final screening report will be submitted to the Canadian Nuclear Safety Commission by CNSC staff for consideration and decision during a public hearing concerning the review of the application to amend Hydro-Québec's licence with respect to the construction and operation of new radioactive waste storage facilities at Gentilly-2.

8.0 PUBLIC REGISTRY

The CNSC has established a public registry for the assessment as required by section 55 of the CEAA. This includes identification of the assessment in the *Federal Environmental Assessment Index* (FEAI), which can be accessed on the Agency's website (www.ceaa.gc.ca). The FEAI number for this project is 35287.

As part of the registry, the CNSC must also maintain a list of documents pertaining to the environmental assessment. Interested parties may obtain copies of specific documents on the list by contacting the CNSC (see section 13.0).

9.0 SCOPE OF THE PROJECT

In determining the scope of a project for an assessment under the CEAA, one must determine which physical works (e.g., facilities) are involved in the proposal and what specific undertakings will be carried out in relation to those physical works. The physical works involved in this project are all structures within the SRWMF and UFDSF at the Gentilly nuclear complex. Included as part of those physical works are all associated equipment, systems and services within, or immediately associated with, the above structures. This also includes facilities and systems for maintaining the security of the site with the exception of prescribed information.

Associated physical activities that are within the scope of the project include: the modification and the construction of the physical works at the SRWMF, the operation of the physical works at the RWMF, UFDSF and SRWMF, and the specific refurbishment activities which would generate waste requiring management at the SRWMF, as well as the handling and transport of those wastes. A preliminary decommissioning plan for the radioactive waste management facilities will be included in the assessment.

The long-term management of radioactive waste, including irradiated nuclear fuel, is being developed through separate federal policy and legislation. No final options or sites for long-term nuclear fuel waste management have been defined or approved as yet. Provision of national long-term radioactive waste disposal facilities is not a matter for the environmental assessment for the SRWMF and UFDSF at the Gentilly nuclear complex, but rather for the Nuclear Waste Management Organization.

The current operation and continued operation after refurbishment of the Gentilly-2 NGS is not within the scope of the project. However, the incremental environmental effects of continued operation of the Gentilly-2 NGS following completion of the refurbishment project is a factor that is included in the environmental assessment, pursuant to section 16 of the CEAA. The scope of this assessment factor is discussed in section 11.0 of this document.

10.0 FACTORS TO BE CONSIDERED IN THE ASSESSMENT

The scope of the screening assessment under the CEAA must include all the factors identified in paragraphs 16(1) (a) to (d) of the CEAA and, as provided for under paragraph 16(1) (e), any other matter that the CNSC requires to be considered.

Paragraphs 16(1) (a) to (d) require that the following factors be included in the screening:

- 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;

- the significance of the effects identified above;

- comments from the public that are received in accordance with the CEAA and its regulations; and

- measures that are technically and economically feasible and that would mitigate any significant adverse environmental effects of the project.

In accordance with paragraph 16(1)(e) of the CEAA, the CNSC requires that the following additional factors be considered in the environmental assessment:

- the purpose of the project;

- incremental environmental effects of continued operation of the Gentilly-2 NGS following completion of the refurbishment activities; and

- the need for, and requirements of, a follow-up program in respect of the project.

Additional or more specific factors and issues to address in the EA may be identified following consultation with stakeholders during the conduct of the EA.

11.0 ASSESSMENT METHODOLOGY

11.1 Structure of the Screening Report

A recommended structure for the screening report that is to be prepared for this project is provided below as a framework for explaining how the assessment factors are to be systematically considered in the screening study. Information about the project and the existing environment is necessary to permit that consideration, and the results of that consideration will be documented in the screening report to be prepared by the CNSC staff.

The parts of the assessment that will be delegated to Hydro-Québec, pursuant to subsection 17(1) of the CEAA, are to be documented in the form of an EA study report. That EA study report will be attached to the screening report as a support document.

Section Headings for the Screening Report:

1) Introduction
2) Application of the CEAA
3) Application of the Quebec *Regulation Respecting Environmental Impact Assessment and Review*
4) Scope of the Project
5) Scope of the Assessment
6) Project Description
7) Spatial and Temporal Boundaries of the Assessment
8) Description of the Existing Environment
9) Assessment and Mitigation of Environmental Effects
   - description of the assessment methodology,
   - effects of construction,
   - effects of normal operations, malfunctions and accidents, as well as the effects of the environment on the project,
   - incremental environmental effects of continued operation of the Gentilly-2 NGS following refurbishment
10) Cumulative Environmental Effects
11) Significance of Residual Effects
12) Stakeholder Consultation
13) Follow-up Program
14) Conclusions and Recommendations for Decision
15) References.

11.2 Specific Information Requirements

11.2.1 Project Description

The screening report will include a clear statement of the purpose of the project. In this case, the purpose of the modifications to the waste management facilities at the Gentilly nuclear complex is to provide for additional physical works required as a result of the operation of the Gentilly-2 NGS. Furthermore, the new facilities will allow for the possible management of radioactive components and waste resulting from refurbishment activities planned for the Gentilly-2 NGS and from an additional operating cycle.

An adequate description of the project is necessary to permit a reasonable consideration in the screening of the environmental effects of the project. The main objective of the project description is to identify and characterize those specific components and activities associated with the project that have the potential to interact with, and thus result in a likely change or disruption to the surrounding environment, during construction and normal operations and during malfunctions and accidents.

The description of the project will refer to, and elaborate upon, the items identified in the project scope, supported with appropriate maps and diagrams. The description of the project will include a proposed schedule for the modification, construction and operation activities at the SRWMF and UFDSF, and the refurbishment activities at the Gentilly-2 NGS.

The following information will be provided in summary form; where applicable, reference may be made to more detailed information.

General Information, Design Characteristics and Normal Operations

- the location of the project;
- the basic layout and design of the RWMF and UFDSF;
- the basic layout and design of the SRWMF;
- a description of the planned construction and operation activities at the SRWMF and UFDSF;
- the key components of the SRWMF and UFDSF relevant to environmental performance and safety during the construction activities, and during the subsequent operations;
- the key components of the RWMF, UFDSF and SRWMF, and their physical security systems (excluding prescribed information) that are relevant to management of malfunctions and accidents that may occur during the construction activities, and during the subsequent operations;
- a description of the refurbishment activities which would generate radioactive components and waste requiring storage in the SRWMF and UFDSF;
- the inventories of radioactive waste at the RWMF, or that may be generated during the refurbishment activities, including locations and storage methods;
- the sources and characteristics of any potential risks to workers or the environment from the NGS refurbishment activities, and from the construction and operation activities at the RWMF, the UFDSF and the SRWMF;
- a description of the methods for handling and transport of the refurbishment waste that would be stored in the SRWMF;
- the predicted sources, quantities and points of release from the RWMF, UFDSF and SRWMF of emissions and effluents containing radioactive and hazardous waste materials;
- the sources and characteristics of any noise, odour, dust and other likely nuisance effects from the project;
- the results of past emission and effluent monitoring at the project site as relevant to establishing a pre-project environmental baseline and making predictions of environmental performance; and
- a description of the relevant organizational and management structure, and staff qualification requirements, with emphasis on safety and environmental management programs.

Malfunctions and Accidents

Information on project malfunctions and accidents is necessary to permit consideration of relevant environmental effects in the screening. The information on malfunctions and accidents will include:

- an identification and discussion of any past abnormal RWMF and UFDSF operations, accidents and spills to the extent that they are relevant to the current assessment;

- a description of specific, important malfunction and accident events that have a reasonable probability of occurring during the operating life of the RWMF, the UFDSF and the SRWMF, including an explanation of how those events were identified for the purpose of this environmental assessment;

- a description of the source, quantity, mechanism, rate, form and characteristics of contaminants and other materials (physical, chemical and radiological) likely to be released to the surrounding environment during the postulated malfunction and accident events; and

- a description of any contingency, clean-up or remediation work that would be required during, or immediately following, the postulated malfunction and accident events.

Decommissioning Plan

A preliminary decommissioning plan for the RWMF, the UFDSF and the SRWMF will be included in the assessment. The plan will document, as appropriate, the preferred decommissioning strategy and end-state objectives, and an overview of the principal hazards and protection measures envisioned for decommissioning.

The long-term management of radioactive waste, including irradiated nuclear fuel, is being developed through separate federal policy and legislation. No final options or sites have been defined or approved as yet. Provision of national long-term waste disposal facilities is not within the scope of this environmental assessment, and is not part of the decommissioning planning information.

11.2.2 Spatial and Temporal Boundaries of the Assessment

The consideration of the environmental effects in the screening needs to be conceptually bounded in both time and space. This is more commonly known as defining the assessment *study areas* and *time frames*, or spatial and temporal boundaries of the screening.

The geographic study areas for this screening must encompass the areas of the environment that can reasonably be expected to be affected by the project or which may be relevant to the assessment of cumulative environmental effects. Study areas will encompass all relevant components of the environment including the people, land, water, air and other aspects of the natural and human environment. Study boundaries will be defined taking into account ecological, technical and social/political considerations.

The following spatial boundaries will be considered for general planning purposes. Actual boundaries used in the environmental effects analysis will be selected to reflect specific interactions between the project and Valued Environmental Components (VECs). Please refer to Figures 1 and 2.

Biophysical and Health Effects

- *Site Study Area*: Corresponding to the exclusion zone around the Gentilly-2 NGS, and including the cooling water intake and outfall structures. Health and safety of workers will be evaluated within the exclusion zone.

- *Local/Regional Study Area*: VEC-specific boundaries will be established, taking into account the ecological characteristics of each VEC, where there is potential for the project to cause environmental effects beyond the exclusion zone. Health and safety of the public will be evaluated within this study area. Please refer to Figures 1 and 2.

Socio-economic Effects

- *Local Study Area*: Environmental effects on socio-economic and cultural VECs will be evaluated on a local scale. The local study area corresponds to the territory within which a comprehensive inventory of the environmental components that may be affected by the project will be conducted. It spans both sides of the St. Lawrence River and covers approximately 150 km^2. On the south shore, it encompasses part of the city of Bécancour, including the Gentilly sector. On the north shore, it encompasses a tiny part of the Sainte-Marthe-du-Cap sector of the new city of Trois-Rivières, as well as part of the municipality of Champlain. (See Figure 1.)

- *Regional Study Area*: This area corresponds to the territory covered by Hydro-Québec's monitoring program for the Gentilly nuclear complex and to the territory delineated to assess the perception of risk. The St. Lawrence River runs through the centre of the area, which covers 920 km^2. On the south shore, it is located almost entirely within the boundaries of the regional county municipality (RCM) of Bécancour which is part of the administrative region of Centre-du-Québec. It encompasses the territory between Saint-Pierre-les-Becquets and the hamlet of Port-Saint-François. On the north shore, this study area encompasses the territory between the municipality of Batiscan and the boundary between the Pointe-du-Lac and Trois-Rivières-Ouest sectors of the new city of Trois-Rivières. This territory is part of the administrative region of Mauricie. Only a small area located in the northwest part of this area is included within the boundaries of the municipality of Notre-Dame-du-Mont-Carmel, which is located in the RCM of Centre-de-La-Mauricie. (See Figure 2.)

The temporal boundaries for this assessment must establish over what period of time the project-specific and cumulative effects are to be considered. These are identified as follows:

- Short-term: construction of structures required for the NGS refurbishment activities, if they proceed, including temporary and permanent structures, and structures at the SRWMF (2006-2007);

- Mid-term: conduct of the NGS refurbishment activities, if they proceed, including retube activities, and operation of the structures at the SRWMF designed to receive retube waste (2008-2009);

- Long-term: ongoing operations at the RWMF, UFDSF and the SRWMF.

Both the study areas and time frames will remain flexible during the assessment to allow the full extent of a likely environmental effect to be considered in the screening. For instance, should the results of modelling demonstrate that there is dispersion of a contaminant that is likely to cause an environmental effect beyond the boundaries identified above, the effect will be taken into account in the assessment.

11.2.3 Description of the Existing Environment

A description of the existing environment is needed to determine the likely interactions between the project and the surrounding environment; and likewise between the environment and the project (for example, external natural hazards). Both the biophysical environment and the socio-economic (human, cultural) environment are to be considered.

An initial screening of likely project environment interactions will be considered in identifying the relevant components of the environment that need to be described.

The general components of the environment that should be described in the various study areas include, but should not necessarily be limited to:

- meteorology and climate;
- air quality;
- noise;
- physiography and topography;
- soil quality;
- geology;
- seismic activity;
- hydrogeology;
- groundwater quality (physical and chemical);
- surface hydrology;
- surface water quality (physical and chemical);
- aquatic ecology; and
- terrestrial ecology (including migratory birds and species at risk).

The description of the socio-economic components of the above environment should include, but should not necessarily be limited to:

- population (including relevant demographic characteristics);
- economic base;
- community infrastructure and services;
- renewable and non-renewable resource use;
- existing and planned land use;
- heritage, cultural or archaeological sites;
- recreation areas; and
- use of lands and resources for traditional purposes by aboriginal persons.

Valued Environmental Components (VECs) in the existing environment will be identified and used as specific environmental assessment end-points. VECs are environmental attributes or components identified as having a scientific, cultural, economic, human health or aesthetic value. The VECs proposed in the EA methodology for this project will be reviewed and accepted by CNSC staff in the early stages of the EA.

The required level of detail in the description of the existing environment will be less where the potential interactions between the project and various components of the environment are weak or remote in time and space.

Relevant existing information may be used to describe the environment. Where that information is significantly lacking, additional research and field studies may be required to complete the screening assessment. Any work being done by Hydro-Québec to fill identified gaps in information will be reviewed and approved by CNSC staff as progress is being made.

11.2.4 Assessment and Mitigation of Environmental Effects

The consideration of environmental effects in the screening will be done in a systematic and traceable manner. The assessment methodology will be summarized. The results of the assessment process should be clearly documented using summary matrices and tabular summaries where appropriate.

11.2.4.1 Assessment of Effects Caused by the Project

The assessment will be conducted in a manner consistent with the following general method:

1) ***Identify the potential interactions between the project activities and the existing environment during construction and normal operations, during identified relevant malfunctions and accidents, and during decommissioning.***

   Specific attention will be given to interactions with the identified VECs.

2) ***Describe the resulting changes that likely would occur to the components of the environment and VECs as a result of the identified interactions with the project.***

Each environmental change must be described in terms of whether it is direct, indirect, positive or adverse.

Identified changes in health and socio-economic conditions and various aspects of culture, heritage, archaeology and traditional land and resource use may be limited to those that are likely to result from the predicted changes that the project is likely to cause to the environment. The consideration of public views, including any perceived changes attributed to the project, should be recognized in the assessment methodology.

Quantitative as well as qualitative methods may be used to identify and describe the likely adverse environmental effects. Professional expertise and judgement may be used in interpreting the results of the analyses. The basis of predictions and interpretation of results, as well as the importance of remaining uncertainties, will be clearly documented in the EA study report.

3) ***Identify and describe mitigation measures that may be applied to each likely adverse effect (or sequence of effects), and that are technically and economically feasible.***

Mitigation strategies should emphasise tempering or preventing the cause or source of an effect, or sequence of effects, before addressing how to reverse or compensate for an effect once it occurs.

Where the prevention of effects cannot be assured, or the effectiveness of preventive mitigation measures is uncertain, further mitigation measures in the form of contingency responses, including emergency response plans, will be described.

Where cost/benefit analyses are used to determine feasibility of mitigation measures, the details of those analyses will be included or referenced.

4) ***Describe the significance of the environmental effects that likely will occur as a result of the project, having taken into account the implementation of the proposed mitigation measures.***

The criteria for judging and describing the significance of the remaining post-mitigation effects should include some or all of the following: magnitude, duration, frequency, timing, probability of occurrence, ecological and social context, geographic extent, and degree of reversibility. Specific assessment criteria proposed in the EA methodology for this project will be reviewed and accepted by CNSC staff in the early stages of the EA.

Existing regulatory and industry standards and guidelines can be used as points of reference for judging significance. Professional expertise and judgement should also be applied in judging the significance of any effect. All applicable federal and provincial laws must be respected.

The analysis must be documented in a manner that readily enables conclusions on the significance of the environmental effects to be drawn. The CNSC must document in the screening report a conclusion, taking into account the mitigation measures, as to whether the project is likely to cause significant adverse environmental effects.

11.2.4.2 Assessment of the Effects of the Environment on the Project

The assessment must also take into account how the environment could adversely affect the project; for example, from severe weather or seismic events. The assessment must also take into account any potential effects of climate change on the project, including an assessment of whether the project is sensitive to changes in climatic conditions during its life span. Should this be determined to be likely, specific measures should be proposed to address any potential risk to the waste facility

This part of the assessment will be conducted in a step-wise fashion, similar to that described for the foregoing assessment of the project effects. The possible important interactions between the environment and the project will be first identified, followed by an assessment of the effects of those interactions, the available additional mitigation measures, and the significance of any remaining likely adverse environmental effects.

11.2.4.3 Assessment of Incremental Environmental Effects of Continued Operation of the Gentilly-2 NGS Following Refurbishment

The assessment will take into account any incremental environmental effects that may result from continued routine operation of the Gentilly-2 NGS following completion of the refurbishment activities.

Incremental environmental effects are defined as those effects resulting from routine operations of the Gentilly-2 NGS following the proposed refurbishment project. They include environmental effects that may result from operational activities such as emissions to air and water, supply of fresh water, cooling water intake and conventional solid waste management, as well as impacts on the socio-economic and cultural environments. Incremental environmental effects are to be evaluated, to the extent reasonable, using current operating conditions as the baseline for the analysis.

This part of the assessment will be conducted in a step-wise fashion, similar to that described for the foregoing assessment of the project effects. An identification of baseline environmental conditions associated with current operations of the NGS will be provided. In addition, the analysis should provide a description of any past effluent or environmental monitoring results that may have a bearing on the prediction of any incremental environmental effects following refurbishment, if it proceeds. The assessment timeframe will be consistent with the purpose of the proposed refurbishment project, namely the extension of operations of the Gentilly 2 NGS until 2035.

Existing environmental information, studies and assessments that have been prepared for other assessment purposes may be used to the extent appropriate in support of this analysis, consistent with subsection 24(1) of the CEAA. In such a case, supplementary information should be provided for the purpose of updating the previous studies or assessments in terms of, for example, significant changes to the environment, changes in the circumstances of the operations at the site, and any significant new information relating to the past or current environmental effects of the facility.

11.2.5 Assessment of Cumulative Effects

The effects of the project must be considered together with those of other projects and activities that have been, or will be carried out, and for which the effects are expected to *overlap* with those of the project in the same geographic area and time. These are referred to as *cumulative environmental effects*.

An identification of the specific projects and activities considered in the cumulative effects will be included in the screening report. In general, the cumulative effects assessment will consider the combined effects of the project with the neighbouring or regional industries and other developments.

With regards to past and current projects, the consideration of cumulative effects in the screening should acknowledge the extent to which past and current projects, including those directly related to the Gentilly facilities, have contributed to the conditions documented in the description of the existing environment.

The consideration of cumulative environmental effects may be at a more general level of detail than that considered in the assessment of the direct project-environment interactions.

Where potentially significant adverse cumulative effects are identified, the consideration of additional mitigation measures may be necessary.

11.2.6 Significance of the Residual Effects

The preceding steps in the screening will consider the significance of the environmental effects of the project on the environment, the effects of the environment on the project, project malfunctions and accidents, and other projects and activities that could cause cumulative effects. Consideration will also be given to the significance of any incremental environmental effects resulting from continued operations of the Gentilly-2 NGS following the possible refurbishment activities.

The screening will consider all of these effects in coming to a final conclusion as to whether the project, taking into account the mitigation measures, will likely cause significant adverse environmental effects. The CNSC will document this conclusion in the screening report.

11.2.7 Stakeholder Consultation

The assessment will include notification of, and consultation with, the potentially affected stakeholders, including the local public. Various media will be used to inform and engage individuals, interest groups, local governments and other stakeholders in the assessment. Hydro-Québec will be expected to hold appropriate public consultation events. The stakeholder consultation program of Hydro-Québec is to be reviewed and accepted by CNSC staff in the early stages of the EA study.

The objective of the consultation program will include informing, consulting with, and addressing the concerns of stakeholders. The consultation plan must demonstrate that all relevant stakeholders are being covered by the program, and that consulting activities will be effective in soliciting and obtaining public input on environmental assessment issues.

Various stakeholders will be consulted throughout the environmental assessment process, including interested parties from:

- federal government;
- provincial government;
- local government;
- First Nations and aboriginal communities;
- Hydro-Québec employees;
- general public;
- neighbouring residents;
- local businesses; and
- non-government organizations and interest groups.

The screening report will contain a summary review of the comments received during this environmental assessment process. The screening report will indicate how issues identified have been considered in the completion of the assessment, or where relevant, how they may be addressed in any subsequent regulatory licensing and compliance process.

The CNSC will also establish a public consultation process in the review and decision-making process for the screening report. This will include opportunities for the public to review and comment to CNSC staff on the draft screening report, as well as to comment and present interventions before the Commission on the final screening report. The latter will be held in association with the CNSC Licensing Hearing for the amendment of the operating licence for the radioactive waste facility.

11.2.8 Follow-up Program

A preliminary design and implementation plan for a follow-up program will be included in the screening report.

The purpose of the follow-up program is to assist in determining if the environmental and cumulative effects of the project are as predicted in the screening report. It is also to confirm whether the impact mitigation measures are effective and to determine if new mitigation strategies are required. The design of the program will be appropriate to the scale of the project and the issues addressed in the EA.

The CNSC licensing and compliance program associated with the operating licence of the radioactive waste facility will be used as the mechanism for ensuring the final design and implementation of the follow-up program and the reporting of the program results. The program will be based on regulatory principles of compliance, adaptive management, reporting and analysis.

12.0 CONCLUSIONS AND RECOMMENDATIONS FOR DECISION

The Screening Report will present the conclusions of CNSC staff as to whether the project is likely to cause significant adverse environmental effects, taking into account the appropriate mitigation measures.

Recommendations to the Commission on making decisions on the environmental assessment and project-related public concerns, consistent with section 20 of the CEAA, will be provided. These decisions by the Commission will be made as part of its licensing hearing on Hydro-Québec's application for amendment of the operating licence for the radioactive waste facility.

13.0 CONTACTS FOR THE ASSESSMENT

Anyone wishing to obtain additional information or provide comments on any aspect of the environmental assessment being conducted on the proposed modifications to the radioactive waste management facilities at the Gentilly-2 NGS can do so through the following contacts:

Mr. Francois Leduc Licensing Project Officer Wastes and Geosciences Division Canadian Nuclear Safety Commission 280 Slater Street P.O. Box 1046 Ottawa, Ontario K1P 5S9 Phone: 1-800-668-5284 Fax: (613) 995-5086 Internet: ceaainfo@cnsc-ccsn.gc.ca	Mr. Guy Riverin Environmental Assessment Specialist Processing Facilities & Technical Support Division Canadian Nuclear Safety Commission 280 Slater Street P.O. Box 1046 Ottawa, Ontario K1P 5S9 Phone: 1-800-668-5284 Fax: (613) 995-5086 Internet: ceaainfo@cnsc-ccsn.gc.ca

14.0 GLOSSARY OF TERMS

1. "**environmental effect**" means, in respect of a project,

(a) any change that the project may cause in the environment, including any effect of any such change on health and socio-economic conditions, on physical and cultural heritage, on the current use of lands and resources for traditional purposes by aboriginal persons, or on any structure, site or thing that is of historical, archaeological, paleontological or architectural significance, and

(b) any change to the project that may be caused by the environment,

whether any such change occurs within or outside Canada.

NOTE: The above definition was extracted from the CEAA.

2. **RWMF**: Waste management facility where solid radioactive wastes from the operation of the Gentilly-2 NGS are being stored. This facility is not expected to be enlarged under this project.

3. **UFDSF**: Waste management facility where used fuel from the Gentilly-2 NGS is being stored. This facility will be enlarged in order to receive the used fuel generated by the continuation of operations until 2035. A total of 15 new CANSTOR modules will be built, 4 of which are over and above what was authorized in 1994.

4. **SRWMF**: Solid Radioactive Waste Management Facility to be developed in order to implement:

- waste management units intended for solid radioactive wastes resulting from the operation of the station;
- the required units for the management of radioactive wastes resulting from the reactor retubing and other station refurbishment work.