

Preliminary Decommissioning Plan

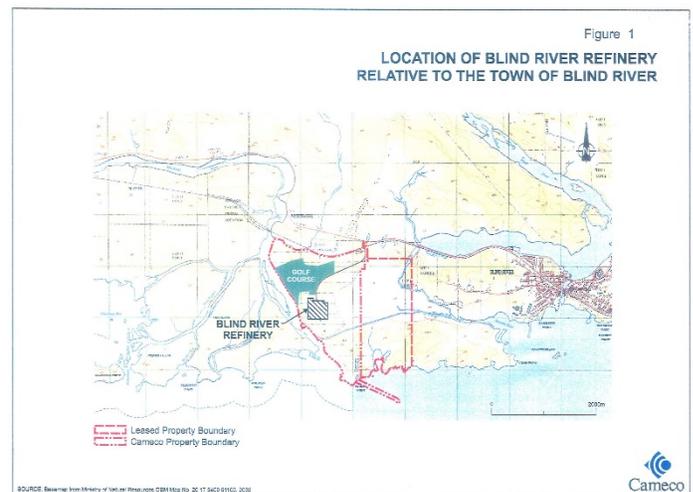
Cameco Corporation's (Cameco) Blind River Refinery (BRR) holds an operating licence from the Canadian Nuclear Safety Commission (CNSC) to refine uranium ore concentrate that is further processed for use in the fuel for nuclear generating stations. The BRR is located about 5 kilometers to the west of the Town of Blind River, with a secured area of 11.3 hectares.

The CNSC requires Cameco and all owners of licensed nuclear facilities to prepare a Preliminary Decommissioning Plan (PDP) in order to ensure that taxpayers are not left responsible for cleaning up a facility if the owner/operator were to become insolvent. The PDP includes an estimate of the cost of decommissioning the facility in present day dollars and also provides a high-level concept of how the facility would be decommissioned. The licensee is required to provide a financial guarantee to the Government of Canada that covers the estimated cost of decommissioning activities described in the PDP. CNSC regulatory guide G-219 Decommissioning Planning for Licensed Activities provides guidance to licensees on the development of a PDP. Aspects of CSA N294-14 Decommissioning of facilities containing nuclear substances describes requirements of final decommissioning planning, aspects of which have been incorporated into the PDP.

It is important to note that the PDP is a planning tool, as it forms the basis for establishing a financial guarantee for decommissioning and the structural outline of subsequent detailed decommissioning plans. Decommissioning of the facility requires the development of detailed decommissioning plans and the licensee to submit an application for and to obtain a decommissioning licence from the CNSC. This level of detail required for a decommissioning licence may only be determined once the operations have ceased.

Cameco PDP Review Process

Cameco is required to update the PDP every five years to account for changes at the facility, potential changes to the technical decommissioning options and other factors that may impact the cost estimate used to derive the financial guarantee for the decommissioning of the facility. The PDP update is completed by a third party engineering firm with expertise in decommissioning, demolition, remediation and cost estimating. It is then reviewed and revised as appropriate before it is approved by Cameco and submitted to CNSC staff for review and acceptance. The proposed changes to the financial guarantee are then presented to the Commission for approval, following which Cameco secures the appropriate financial instrument(s) for the total amount of the decommissioning cost estimate.



All of Cameco’s Ontario facilities licensed by the CNSC have their own PDP, each of which uses a common assumption that waste from the Port Hope Conversion Facility (PHCF), Cameco Fuel Manufacturing (CFM) and Blind River Refinery (BRR) would be consolidated at a low level radioactive waste management cell at the Blind River site. This location is proposed because the licensed facility in Blind River has available land, an excellent operating record and strong community support. In addition to the decommissioning licence approvals required for each of the facilities described above, this proposed waste management cell would also require a waste nuclear substance licence that would follow the CNSC licensing process, which includes public participation.

Planning and Consultation

The planning for the decommissioning of the Cameco BRR will be an ongoing and complicated process that involves consultation with:

- the CNSC;
- other interested federal departments;
- the provincial Ministry of Environment and Climate Change (MOECC);
- other provincial ministries;
- the Town of Blind River; and,
- the Mississauga First Nation.

Basic Decommissioning Principles

The broad scope of the proposed decommissioning process is described in the PDP, including a detailed description of the physical properties of the site, summary of previous environmental site characterization, a description of the areas and buildings to be decommissioned and the general structure and sequence of the main decommissioning work packages. This information is summarized below.

The decommissioning planning process requires the following activities:

- Preparation of documentation in support of obtaining a formal decommissioning licence, including:
 - Environmental monitoring and reporting;
 - Radiological monitoring and reporting;
 - Conventional health safety monitoring and reporting that is associated with the decommissioning project;
- Decontamination and segregation of chemicals, materials and equipment;
- Final disposition of chemicals, materials and equipment;
- Site restoration; and,
- Ongoing monitoring and maintenance of any institutional controls.



The cost estimates and schedule are based upon a “decommissioning tomorrow” scenario, so that financial assurances will be based upon the current estimated cost of decommissioning. This will ensure that sufficient finances are available, even if the licensee (i.e., Cameco) is not available to fulfill its obligations for decommissioning. The cost estimate for decommissioning is completed by a third party engineering firm following the guidance of G-206 Financial Guarantees for the Decommissioning of Licensed Activities.

BRR Decommissioning Strategy

The BRR PDP addresses all decommissioning activities that will be required after shutdown of the BRR at the end of its operating life many years from now. Decommissioning would occur immediately after regulatory approvals were obtained. Material would be free-released or recycled to the extent possible, however it is recognized that this is not possible for all materials. The uranium contaminated building materials, equipment and soils would be placed into an onsite encapsulated mound that would be licensed in perpetuity as a long-term waste management facility (LTWMF), which would also contain decommissioning material from Cameco's Port Hope facilities. The PDP considers the decommissioning of the existing BRR facility and the construction, licensing and maintenance in perpetuity of the Blind River LTWMF.

BRR Decommissioning Activities

It is anticipated that the decommissioning of the BRR facilities would be completed in two parts. Part I is comprised of clean work areas (areas that did not process radioactive materials and are expected to meet free-release criteria after industrial vacuuming) and Part II is comprised of uranium contaminated work areas (areas where the processing of radioactive materials took place), accumulated waste and contaminated soil.

Part II Activities are anticipated to generate approximately 45,000 m³ of contaminated materials from the BRR that would be incorporated into the conceptual on-site Blind River LTWMF.

Blind River Long-Term Waste Management Facility

The BRR PDP also documents the expectations for the on-site LTWMF that would contain decommissioning wastes from Cameco's Ontario operations licensed by the CNSC (PHCF, CFM and BRR). The conceptual design of the waste storage cell includes a base liner containment system, a leachate collection system and a final cover system. The conceptual design has been sized to provide a total capacity of 148,000 m³ including a contingency allowance.

End State Objectives

The overall end state objective is to remove all of the facility structures and services so that the site, with the exclusion of the Blind River LTWMF, will be available for a wide range of commercial, industrial and retail land uses that make use of the buildings and structures to remain.

Overall PDP Methodology

In the development of the PDP, the following information is compiled:

- An inventory of the buildings summarizing the expected contamination associated with each area;
- The soil conditions at the site including quantities of contaminated soil are summarized; and,
- Summary of the accumulated waste currently stored at the refinery.

The information was used to develop high level plans for:

- Building Demolition:
 - removal of hazardous materials;
 - decontamination of structures;
 - stripping equipment and services;
 - demolition of structures;
 - dust control;
 - preparation and decontamination of debris;
 - monitoring; and,
 - recovery of materials.
- Soil Excavation; Further considerations include:
 - underground services;
 - temporary storage of excavated soil;
 - surface water control and water treatment;
 - backfilling; and,
 - restoration.
- Radiological Monitoring and Survey Commitments
- Waste Management Strategy – includes:
 - disposition of radioactive waste at the on-site LTWMF;
 - surplus material meeting free-release criteria;
 - waste diversion; and,
 - alternate commercial waste disposal.

Summary

This information was used to develop the cost for decommissioning following the guidance of G-206 *Financial Guarantees for the Decommissioning of Licensed Activities*. The current estimated cost for final decommissioning of the Blind River Refinery, including the construction, licensing and perpetual maintenance of a long-term waste management facility is \$48 million, which represents an increase of \$9.4 million from the PDP and financial guarantee approved during the 2012 licence renewal. The \$48 million includes allocations of \$13,400,000 for demolition, \$12,500,000 for the on-site waste management facility construction and monitoring, \$1,063,000 for off-site waste management and \$21,037,000 for project related costs including engineering, construction management, radiological, and other monitoring as well as an escalation provision and contingency funds. These proposed changes to the financial guarantee will be presented to the Commission for approval in October 2017. Once approved by the Commission, Cameco will secure the appropriate financial instrument(s) for the total amount of the decommissioning cost estimate and submit this information to the CNSC.

