



## **Preliminary Decommissioning Plan and Cost Estimate**

The Cameco Corporation (Cameco) McArthur River Operation (McArthur River) is located approximately 630 kilometers (kms) north of Saskatoon, Saskatchewan. McArthur River holds a Uranium Mine Licence from the Canadian Nuclear Safety Commission (CNSC) to prepare a site for, construct, operate, modify and decommission a nuclear facility for mining uranium ore, as well as an Approval to Operate Pollutant Control Facilities from the Saskatchewan Ministry of Environment (SMOE).

The CNSC and the SMOE require operators of licensed nuclear facilities to prepare a Preliminary Decommissioning Plan (PDP) and associated Preliminary Decommissioning Cost Estimate (PDCE) 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 provides a high-level concept of how the facility would be decommissioned. The PDCE provides an estimate of the expected cost of decommissioning the facility, based on the concepts within the PDP. Cameco is required to provide a financial guarantee, such as letters of credit or surety bonds, to the Government of Saskatchewan that cover the estimated cost of decommissioning activities described in the PDP for McArthur River.

The cost estimates and schedule within the PDP and PDCE are based upon a conceptual decommissioning plan for the site. The financial guarantee reflects the current estimated cost of decommissioning. As the site approaches or goes into decommissioning, regulators review the detailed decommissioning plans, which can result in further regulatory process, as well as additional requirements, costs and financial assurances.

The concepts outlined in the PDP are based upon the findings of previous approved studies, including environmental assessments, which have been completed at McArthur River. It is important to note that the PDP is a planning tool, as it forms the basis for establishing a financial guarantee to support future decommissioning activities. The PDP also provides the structural outline of a subsequent Detailed Decommissioning Plan (DDP). Decommissioning of the facility requires the development of a DDP and submission of this document for review and approval from the CNSC and SMOE.

### **Cameco PDP Review Process**

Cameco is required to update the PDP and PDCE 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 decommissioning of the facility. The revised PDP and PDCE are then submitted to the CNSC and SMOE for review and acceptance. Upon acceptance by the SMOE and CNSC staff, a formal CNSC Commission hearing is required for final approval of the PDP and PDCE by the CNSC. Once approved, Cameco adjusts the value of the financial guarantee to reflect the revised decommissioning cost estimate. The financial instruments are payable to the Government of Saskatchewan.

### **Basic Decommissioning Process**

The planning for the decommissioning of McArthur River is an ongoing process. The broad scope of the proposed decommissioning process is described in the PDP. The process includes a 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. At a high level, the decommissioning process requires the following activities:

- **Decommissioning Approvals:**
  - Development of DDP;
  - Application for required regulatory approvals;
- **Active Decommissioning:**
  - Ceasing production and transitioning the site to a safe state for decommissioning;
  - Underground placement of waste materials;
  - Allowing the mine to naturally flood;
  - Decommissioning of remaining surface infrastructure;
  - Contouring, grading and re-vegetation of the site;
  - Decommissioning the ore haul road and the remaining Fox Lake road infrastructure ;
- **Environmental Monitoring:**
  - Monitoring conducted during active decommissioning;
  - Monitoring conducted following active decommissioning to confirm that the site is in safe and stable condition; and
- **Transfer of the property to the Government of Saskatchewan’s Institutional Control Program**  
(Institutional Control).

The DDP would be developed with consideration of feedback provided by relevant stakeholders gathered through community outreach and stakeholder engagement.

### Basic Decommissioning Strategy

The objective of the PDP is to have a plan in place to decommission and reclaim McArthur River minesite to an ecological and radiological condition that is as similar to the surrounding environment as is reasonably achievable. An additional objective is that the minesite will be suitable for traditional land use with no access restrictions following decommissioning and acceptance into Institutional Control.

The McArthur River PDP addresses decommissioning activities that will be required after cessation of mining activities. The PDP currently includes the following strategies for decommissioning of infrastructure at McArthur River:

- **Underground facilities:**
  - Underground hazardous substances (e.g., hydraulic oil, diesel fuel, gasoline, paint, engine coolant, etc.) will be moved to surface for use or transported off-site for recycling or disposal in accordance with applicable regulations;
  - Surface boreholes will be grouted in accordance with regulatory requirements;
  - Any remaining minewater treatment plant residue, mineralized core samples and miscellaneous contaminated solid waste will be placed underground;
  - The mine will be allowed to flood naturally;
  - The shafts will be filled with decommissioning waste and capped with an engineered shaft cap;
- **Surface building and facilities:**
  - Contaminated surface infrastructure will be dismantled and placed underground or transported off site to an approved facility;
  - Non-contaminated surface infrastructure will be disassembled and disposed of at the McArthur River landfill or transported off site to an approved facility;
- **Waste rock storage areas:**
  - Clean waste rock and overburden will be used as backfill, cover material and/or material for grading and contouring the site to promote drainage and re-vegetation or be transported to the McArthur River landfill;
  - Mineralized and potentially acid generating waste rock and waste rock sub-liner materials will be moved underground;

- **Site access road and security gatehouse:**

- The ore haul road will be decommissioned with contaminated material being transported off site to an approved facility and clean material being disposed of in the McArthur River landfill; and
- All remaining Fox Lake road culverts and bridges will be removed and transported to the McArthur River landfill or Key Lake landfill.

### **Financial Guarantee**

The above information was used to develop the PDCE and associated financial guarantee for McArthur River. The current PDCE for McArthur River is \$42.1 million, which represents a decrease of \$6.3 million from the PDP and PDCE submitted in 2013. The decrease in the PDCE was primarily due to increased efficiencies in equipment usage and material handling. The current PDP and PDCE received final regulatory approval in June 2019.