

AECL and Radioactive Waste Management

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Outline

- Context
- AECL mandate, role and responsibilities
- Federal priorities in radioactive waste management
- Near surface disposal facility

Chalk River Laboratories – Leading Innovation For More Than 60 Years



Medical isotopes produced at Chalk River have benefited more than a billion people worldwide

- Chalk River Laboratories is Canada's largest science complex:
 - 9,000 acres in size, 200 acre lab complex
 - 17 nuclear facilities, 70 major buildings (including research reactors and materials research and development facilities)
- Birthplace of Canada's nuclear industry
 - First sustained criticality outside the United States
 - Developed CANDU reactor technology – 19 operating in Canada and 30 internationally (CANDU and CANDU-like)
- Breakthroughs in medical isotopes (cobalt-60), production of other medical and industrial isotopes

AECL Mandate

- Enabling nuclear science and technology
- Managing the Government of Canada's radioactive waste and decommissioning responsibilities

AECL delivers its mandate through a long-term contract with Canadian Nuclear Laboratories for the management and operations of our sites



1. Oversight: AECL brings best value to Canada by overseeing the work of Canadian Nuclear Laboratories under a Government-owned, Contractor-operated model:

- Setting priorities
- Approving annual and long-term plans
- Overseeing compliance with terms and conditions of contracts
- Measuring performance
- Ensuring value for money for Canada and Canadians

2. Interface to Government: AECL continues to be an agent of the Government, delivering on the Government's priorities and providing advice that informs policy-making



AECL does not have a role in the day-to-day operations of Canadian Nuclear Laboratories – focus on the “What” not the “How”

AECL – Priorities

Nuclear Science and Technology



- ▶ Support for the federal government and industry: health, safety, security, energy, emergency management

Decommissioning and Waste Management



- ▶ Addressing legacy and new liabilities to protect the environment
- ▶ Demolition of contaminated buildings; contaminated land remediation
- ▶ Responsibility for historic, low-level radioactive waste

Revitalization of the Chalk River Laboratories



- ▶ \$1.2 billion over 10 years
- ▶ Revitalization of the site with a view to building a world-class science campus

AECL commitment to: health, safety, security, environmental stewardship and bringing value to Canada for the long term

AECL Priority: Decommissioning and Waste Management

- ▶ AECL is responsible for addressing the Government of Canada's decommissioning and waste management responsibilities
- ▶ AECL has asked CNL to accelerate activities in this area in order to reduce risks and protect the environment
 - ▶ AECL reviews and approves CNL's high-level plans to ensure alignment with priorities and value for money for Canada



Contaminated lands



Redundant buildings



***Accumulated waste
(buried and stored)***

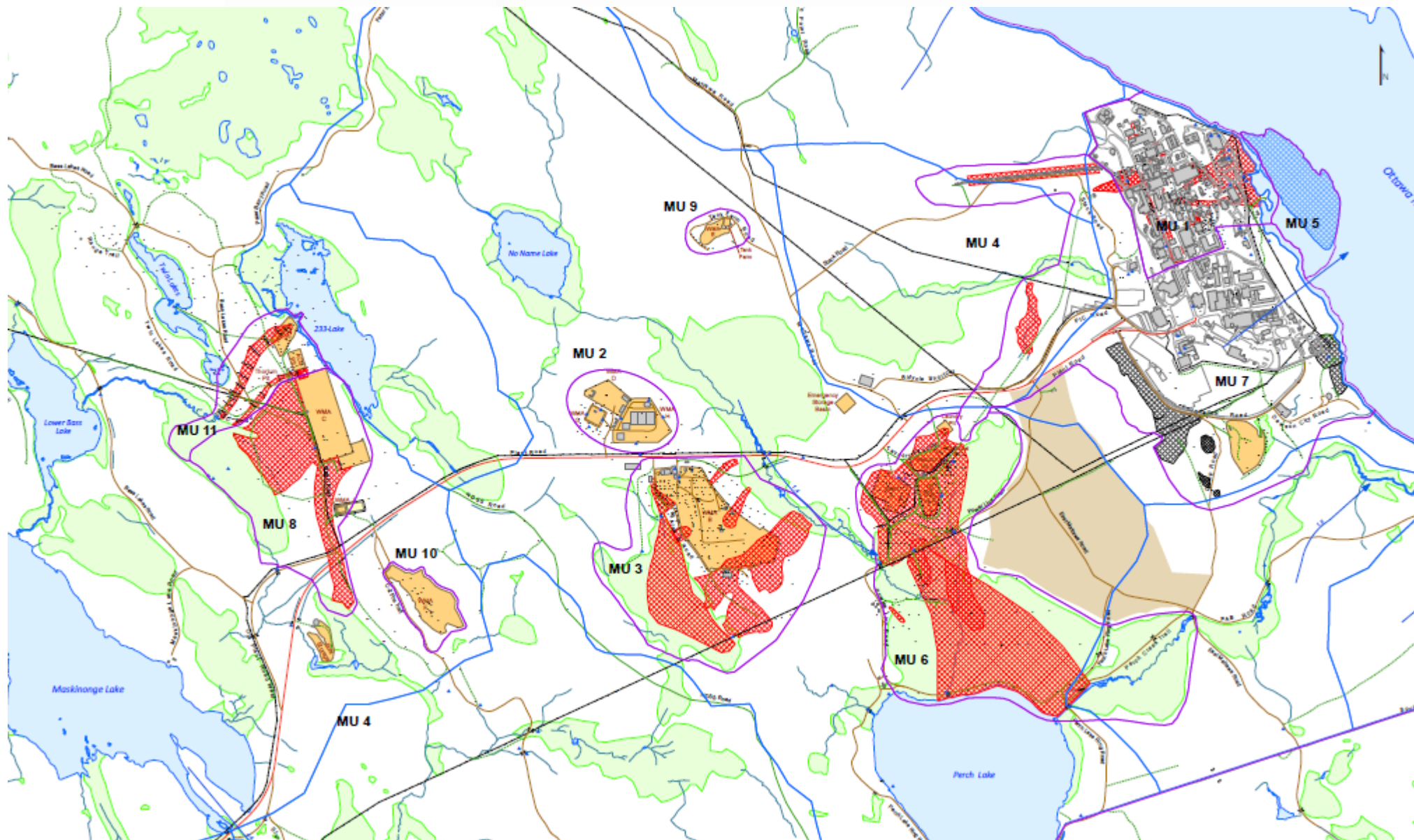
AECL has a responsibility to address its decommissioning and waste management challenges in order to reduce environmental and safety risks, remediate contaminated lands and leave a positive legacy for future generations

Accumulated Waste



Waste Management Area B –
Chalk River Laboratories

Contaminated lands



Chalk River Laboratories – The zones identified in red are contaminated and must be cleaned

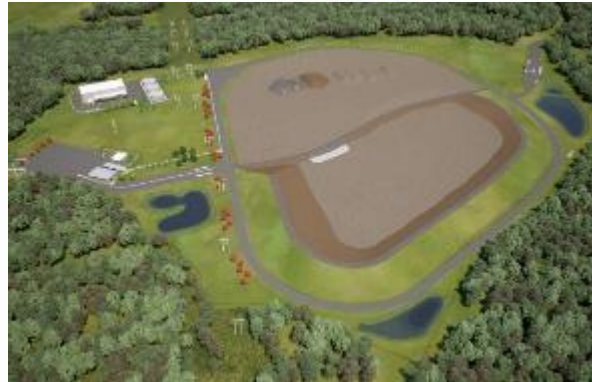
Decommissioning and Waste Management: Key Environmental Projects

Port Hope Area Initiative



- ▶ 1.7 million cubic meters of low-level radioactive waste being emplaced in two near surface long-term management facilities

Near Surface Disposal Facility



- ▶ Proposed to be built at the Chalk River site to dispose of AECL's low-level radioactive waste
- ▶ Will enable the revitalization of the Chalk River site and the remediation of contaminated lands

Nuclear Power Demonstration Reactor



- ▶ Proposal to decommission the NPD reactor in situ by cementing it in place
- ▶ Will further protect the environment and workers

Closure of the Whiteshell site

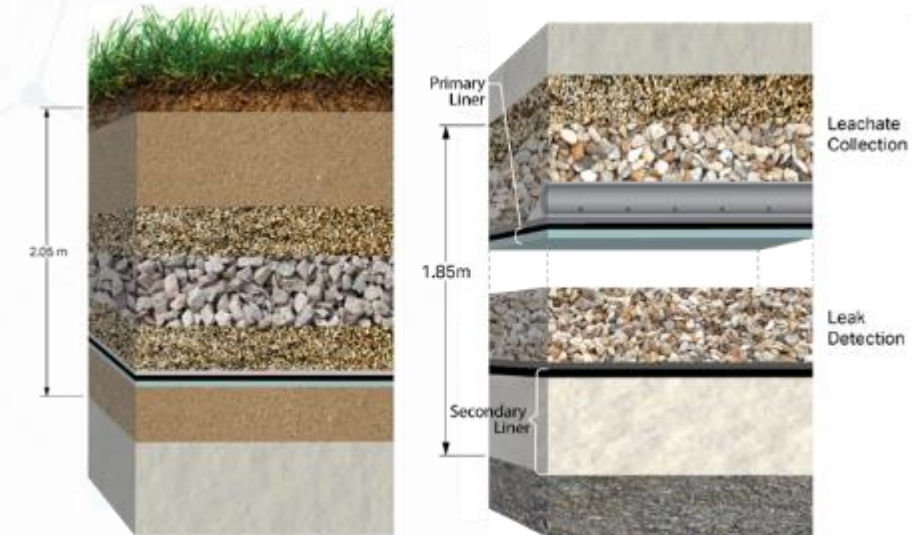
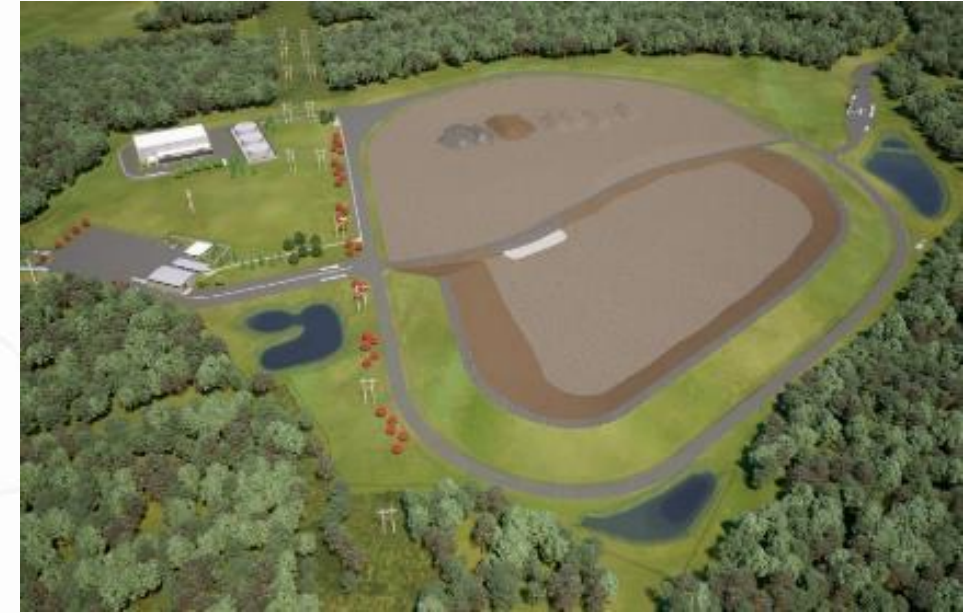


- ▶ Site undergoing decommissioning since mid-90s
- ▶ Proposal to decommission the WR-1 reactor in situ by cementing it in place

Three of CNL's projects are undergoing Environmental Assessments, a process designed to identify potential environmental impacts and engage the public and Indigenous groups. The Canadian Nuclear Safety Commission, Canada's independent nuclear regulator, will only license projects if it can assure itself that they are safe.

Near Surface Disposal Facility

- CNL is proposing to build a facility on the Chalk River Laboratories site to safely dispose of AECL's low-level radioactive waste
- The objective is to safely dispose of waste that is currently stored or that will be produced as a result of ongoing science and technology activities at the Chalk River laboratories
 - CNL plans to decontaminate and decommission more than 120 structures at the Chalk River site in the next 10 years in order to renew and revitalize the site
 - Certain areas of the site need to be remediated (contaminated soils)
 - Other AECL sites are being decommissioned
- Technology has been used at other sites in North America
 - Two similar sites are being constructed (and one is being filled) in Ontario (Port Hope and Clarington) as part of the Port Hope Area Initiative, a project managed by CNL on behalf of AECL



Origin of NSDF Waste

- Planned capacity of **1 million square meters**
- More than 95% of the waste destined to the NSDF is **waste that is owned by AECL**
 - **More than 90% is waste already stored at the Chalk River Laboratories** or which will be produced as a result of ongoing science and technology activities
 - Less than 5% is expected to come from the Whiteshell Laboratories, in Manitoba and other AECL sites (for example the demonstration reactors of Douglas Point and Gentilly-1)
- Less than 5% of the waste will come from hospitals, universities, research centres, and other commercial clients as per existing commercial agreements which have been in place for decades
- **Environmental assessment underway**



AECL and the NSDF / NPD reactor

- AECL is responsible for finding a solution for low and intermediate-level waste
 - AECL has a very large amount of low-level waste (over 95% of the Canadian total)
 - 1.2 million m³ in Port Hope / Clarington, Ontario
 - Nearly 1 million m³ at Chalk River
 - The solution for low-level waste must be based on the level of risk
 - Surface / near-surface solution used in Europe, USA, Port Hope and Clarington
 - Chalk River Site is contaminated in certain areas
 - The NPD reactor site is unique because of its underground construction (exceptional circumstances)
 - AECL has approved CNL's proposed plan for the NSDF and considers the proposed facility to be an appropriate method for the management of low-level radioactive waste
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- AECL also approved CNL's proposed plan for the NPD reactor and considers in situ decommissioning as an appropriate and proven technique to effectively restore sites contaminated with hazardous and radioactive waste and to protect the environment
 - That said, only the Canadian Nuclear Safety Commission has the authority to issue operating licenses for nuclear activities in Canada. The Canadian Nuclear Safety Commission will determine if the proposed facilities are safe

