

FROM HAZARDOUS WASTE TO INTERMEDIATE-LEVEL WASTE: ENABLING THE REMEDIATION AND IN-SITU MANAGEMENT OF WL TRENCHES

**Sean Gamley
Canadian Nuclear Laboratories**

Abstract

Whiteshell Laboratories (WL), located in Manitoba, Canada, provided research facilities for the Canadian nuclear industry starting in the early 1960's. The facility operated until the late 1990s and is currently decommissioning the 11,000 acre site, with a target end-state completion date of 2024. A critical component of the Whiteshell Laboratories Closure Project (WLCP) is the remediation of four (4) unlined Low-Level Waste (LLW) Trenches and the development of a comprehensive safety case to enable the in-situ management of the remaining twenty-one (21) Trenches. The remediation of the Trenches will involve the retrieval, characterization, packaging and off-site transportation of various types of waste, ranging from non-radioactive hazardous wastes to Intermediate-Level Wastes (ILW).

From 1963 until 1985, the Trenches, located in the WL Waste Management Area (WMA), served as the primary on-site storage facility for LLW, as well as select Mixed Wastes generated at WL. The Trenches are unlined but are contained by a low-permeability clay and contain approximately 18,000 cubic meters of waste. The end-state vision for the Trenches (select remediation and in-situ management) was developed, communicated and tentatively accepted as part of the Comprehensive Study Report (CSR), which was completed for the decommissioning of WL under the Canadian Environmental Assessment Act (1992). The acceptance of the CSR did not constitute approval of the in-situ disposal of the LLW Trenches, and CNL made a commitment to develop a safety case, for submission for regulatory review, that addresses all the basic requirements applicable to the long-term aspects of radioactive waste management.

Since the development of the strategic remediation and in-situ management plan, Canadian Nuclear Laboratories (CNL), formerly Atomic Energy of Canada Limited (AECL), has worked on collecting environmental data (through non-intrusive and intrusive characterization methodologies) to confirm that soil and hydrogeological conditions (i.e., the natural containment system) around the Trenches are such that there will be no leaching or transport of contaminants resulting in significant effects on the environment or human health.

This paper will discuss the environmental data collected and assessments completed over the past fifty years, with a focus on the past twenty years of analyses, and will then discuss the technical approach for upcoming remediation activities planned, addressing the wide variety in hazard levels for both radiological and non-radiological contaminants, and the ongoing development of the in-situ management safety case.