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Written submission from the Canadian Nuclear Laboratories Ltd.

Mémoire des Laboratoires Nucléaires Canadiens Ltée

In the Matter of the

À l'égard des

Canadian Nuclear Laboratories Ltd.

Laboratoires Nucléaires Canadiens Ltée

Application for the renewal of the nuclear research and test establishment decommissioning licence for the Whiteshell Laboratories site

Demande visant le renouvellement du permis de déclassement d'un établissement de recherche et d'essais nucléaires pour le site des Laboratoires de Whiteshell

Commission Public Hearing

Audience publique de la Commission

October 23-24, 2024

23-24 octobre 2024

Canada

Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

Commission Member Document for Licensing Decisions

Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories

WL-508760-REPT-006148

Revision 0

Approved by:	Brian Wilcox	2024/07/17
	GM & WL Site Licence Holder	Date

This page is for Content Controls that apply to this document. If no Content Controls apply, none will be listed.

Land Acknowledgement

Whiteshell Laboratories is situated on the traditional lands of Treaties 1 and 3, the lands of the Anicinabe, Ojibway Anishinaabe and the Homeland of the Red River Métis.

The area in which we are situated is also home to Indigenous Peoples from across the region and Canada. Canadian Nuclear Laboratories is grateful to have the opportunity to work on these traditionally and culturally significant lands and waterways. We acknowledge that this site was established without consultation with the Indigenous Peoples of this area.

We also recognize and appreciate the contributions that all First Nations, Métis, and Inuit peoples have made, and continue to make, in shaping this land we now know as Canada. We acknowledge, respect, and seek to better understand the unique Indigenous history, rights, and title on the lands where we work.

Canadian Nuclear Laboratories wishes to confirm our commitment to being an active participant in Canada's journey towards healing and reconciliation through our actions.

EXECUTIVE SUMMARY

This Commission Member Document, prepared by Canadian Nuclear Laboratories (CNL), outlines the progress made toward sustained compliance with all regulatory requirements associated with the decommissioning and restoration of the Whiteshell Laboratories site. This document serves as the basis for CNL's application to renew the Nuclear Research and Test Establishment Decommissioning Licence, set to expire on 2024 December 31.

Whiteshell Laboratories is a research campus that consists of legacy Class IB nuclear facilities, laboratories, and waste management areas established in the early 1960s by Atomic Energy of Canada Limited (AECL) for nuclear research and development. Following the discontinuation of most research programs in 1997, AECL initiated the transition from operation to decommissioning. In 2015, CNL took over as site licence holder, following the implementation of a government-owned, contractor-operated model. The current licence, issued by the Canadian Nuclear Safety Commission (CNSC), covers the period from 2020 to 2024. Canadian Nuclear Laboratories is seeking a three-year licence renewal to continue with activities for the Whiteshell Laboratories Restoration Project, to demonstrate strong, compliant licence performance while continuing with the important site decommissioning and environmental remediation work.

As Canada's leading nuclear science and technology organization, CNL conducts research and development, legacy waste management, environmental remediation, and decommissioning on behalf of AECL. The strategic priorities of CNL emphasize environmental restoration, safety, and stakeholder confidence in nuclear science and technology.

Meaningful engagement with Indigenous Peoples and the public is essential to advance CNL's mission priorities. Extensive engagement and relationship-building efforts have been conducted with Indigenous Nations and governments, including Sagkeeng Anicinabe Nation, Manitoba Métis Federation, and others. These engagements provide opportunity for Indigenous perspectives and concerns to be integrated into the decommissioning process and environmental protection program. Canadian Nuclear Laboratories has also established public liaison committees and partnerships to facilitate transparent communication and address public questions and concerns regarding Whiteshell Laboratories.

Indigenous engagement during the licence period has culminated in many significant developments. Highlights include the signing of five agreements with Sagkeeng Anicinabe Nation and the establishment of the "Niigan Aki" program for Indigenous-led environmental monitoring.

Well established monthly meeting forums with the Manitoba Métis Federation led to a multi-year contribution agreement signed in 2023, including substantial Métis participation in environmental monitoring. In 2024 February, the MMF notified CNL of the MMF's inability to continue the 2023 agreement. Canadian Nuclear Laboratories respects the MMF's decision while continuing to share information. Canadian Nuclear Laboratories remains open and interested in discussion with the MMF and aspires to rebuild a productive partnership to enable full participation of Red River Métis Citizens in projects, licensing, economic benefits and environmental protection opportunities.

Joint engagements, site tours, environmental monitoring participation, and a new relationship agreement signed in 2021 have strengthened CNL's relationship with Black River and Hollow Water First Nations. Monthly meetings have also been established with Grand Council Treaty #3, including ongoing engagement with five member communities with potential interest in the Whiteshell Laboratories Restoration Project.

During the current licence period, CNL has made significant strides in decommissioning and restoration activities, environmental protection, and compliance improvements. With respect to the decommissioning progress, key accomplishments include the removal of the Active Liquid Waste Treatment Centre, continued characterization and environmental assessment of the Whiteshell Reactor - 1, demolition of Building 402, the former Biomedical Laboratory facility, and work on converting the Shielded Modular Above-Ground Storage into a Cask Loading Facility. Canadian Nuclear Laboratories has initiated waste recovery from low level waste storage bunkers and has invested in custom-designed equipment to support safe waste retrieval from intermediate level bunkers and standpipes.

Canadian Nuclear Laboratories has achieved effective management of high, intermediate, and low-level waste. Ongoing monitoring and maintenance of the Concrete Canister Storage Facility and waste management areas have ensured safe and compliant operations.

The Environmental Monitoring Program was also enhanced during the licence period, focusing on engagement with local Indigenous communities to protect environmental resources. The program includes extensive water, air, and soil sampling to ensure protection of the environment. The program provides evidence of very low impact on the environment from the Whiteshell site.

During the licence period, CNL has enhanced safety protocols for emergency management and fire protection measures, including successful implementation of corrective actions to address compliance issues and improve overall safety standards. Enhanced capabilities in emergency management, including regular drills, staff training, and the acquisition of a new fire engine and wildfire truck.

Canadian Nuclear Laboratories has faced several challenges during the licence period, including health and safety considerations related to the COVID pandemic, worker safety, and compliance setbacks in the Fire Protection Program. These challenges led to a prolonged COVID site shut-down period and three work stand-downs. These pauses were necessary to ensure protection of the public, the environment, and staff.

Following the resumption of work after COVID restrictions, a negative trend in industrial near misses was observed by site management. Management initiated a safety stand-down and focused on staff training and work planning. Then during a maintenance activity in 2022, a worker received a low voltage shock as a result of inadequate identification of hazards in the work environment. Again, management proactively stood down all work on site, performed a root cause analysis, and developed a corrective action plan. In 2023, arising from a self-assessment, CNL discovered procedural compliance issues in the Fire and Emergency Management Program. The site was immediately stood down to lower the fire risk on site. Fully qualified staff were deployed from Chalk River Laboratories to meet the minimum on-site fire

fighter contingent. A root cause analysis was conducted and a corrective action plan prepared. Substantial investment in new firefighting equipment has been made. In addition, a comprehensive site re-start plan was developed that requires 8 phases to achieve full resumption of operations and site remediation. The stand-downs have created negative impacts on staff morale, which can be a leading indicator for events. Therefore, CNL has conservatively entered each restart phase intentionally in a slow, controlled approach. To address CNL's top priorities of safety, compliance, and people, CNL developed a House Plan for fiscal year 2024/25. This plan invests heavily in Whiteshell staff and clearly re-establishes regulatory compliance as a priority over restoration work.

Despite these setbacks, CNL has maintained a strong safety record, with no public or worker radiation doses exceeding regulatory limits and all radioactive releases below derived release limits. For the upcoming requested licence period (2025-2027), CNL plans to continue strong demonstration of regulatory performance, sustained by effective nuclear safety culture improvements. Additional improvements to self and independent assessments will closely monitor program performance. In conjunction with the Site Licence Holder, increased oversight through a new Director of Mission Assurance verifies CNL's commitment to improved and sustained satisfactory performance in all Safety Control Areas. For the upcoming requested licence period (2025-2027), CNL plans to continue refining compliance programs to assess their effectiveness over the short and long term.

Canadian Nuclear Laboratories remains committed to the safe, compliant, and transparent decommissioning of the Whiteshell site. Licence renewal is essential for continuing the progress made in restoring the site, engaging with Indigenous Nations and communities, and stakeholders, and protecting the environment. Canadian Nuclear Laboratories' strategic priorities align with its mission to ensure safety, environmental stewardship, and public confidence in nuclear science and technology. The comprehensive efforts outlined in this document reflect CNL's dedication to achieving these goals and moving forward with the restoration of the Whiteshell Laboratories site.

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1. Introduction

Whiteshell Laboratories (WL) is a research campus that consists of legacy Class IB nuclear facilities, laboratories, and waste management areas. WL was established by Atomic Energy of Canada Limited (AECL) in the early 1960s to carry out nuclear research and development activities. Atomic Energy of Canada Limited made a business decision in 1997 to discontinue most of the WL research programs and operations. In 1998, AECL received government concurrence to proceed with actions to achieve closure of WL. In 2009, this task transitioned to Canadian Nuclear Laboratories (CNL), which is carrying out the work to perform decommissioning and achieve restoration of the WL Site on behalf of the owner, AECL.

In 2002, the Canadian Government accepted the Comprehensive Study Report [1], the environmental assessment on the decommissioning of WL, and the Canadian Nuclear Safety Commission (CNSC) issued the first WL Decommissioning Licence to AECL for the period from 2003 to 2008. This Licence was subsequently renewed by the CNSC for the periods from 2009 to 2018/2019 and 2020 to 2024. The current Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5-8.00/2024, expires on 2024 December 31 [2].

Canadian Nuclear Laboratories is Canada's leading nuclear science and technology organization and a world leader in developing innovative applications for nuclear technology. Activities conducted by CNL include research and development, design and engineering of specialized technology, waste management, environmental remediation, and decommissioning. Canadian Nuclear Laboratories is committed to building assurance so that Canadians and people around the world are confident that they are safely and securely receiving energy and, health benefits from nuclear science and technology. In addition, CNL is restoring the environment affected by legacy activities. Canadian Nuclear Laboratories strives to safely deliver all work activities and to provide the highest level of performance in meeting the commitments expected of it by regulators, customers, stakeholders, and the public. Figure 1 provides a graphic of CNL's strategic priorities. Further information about CNL's strategic priorities can be found on our website at cnl.ca.

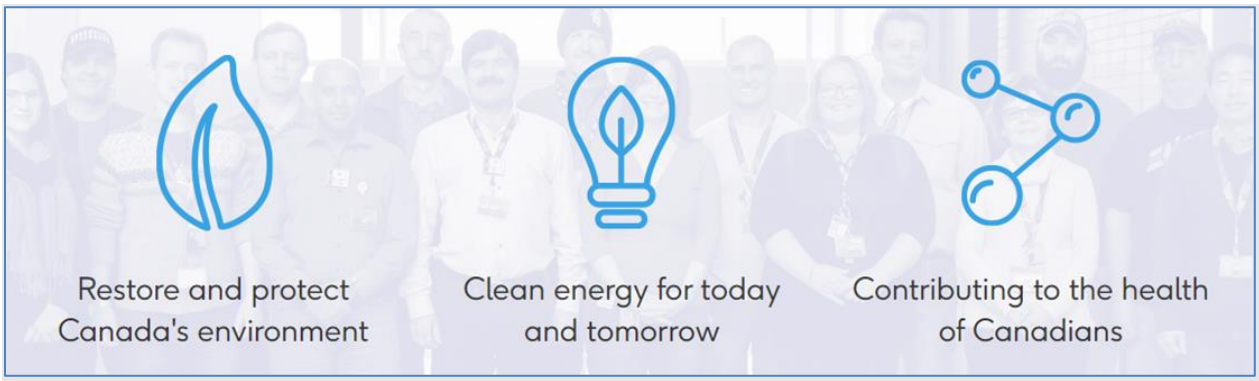


Figure 1: Canadian Nuclear Laboratories strategic priorities.

In 2022 December, the Whiteshell Laboratories Closure Project was renamed the Whiteshell Laboratories Restoration Project (WLRP) to encompass all activities conducted under the WL Licence and better reflect the work being carried out at the WL Site. The WLRP is a key project

for CNL to move forward with its strategic priority to restore and protect Canada's environment, as detailed in Section 1.2.

1.1 Licence Renewal Request

On 2023 November 21 CNL submitted an application to the CNSC for renewal of the Nuclear Research and Test Establishment Decommissioning Licence for WL [2] (CNL Licence Application – Whiteshell Laboratories). The proposed term for the renewed Licence is a three-year period to commence on 2025 January 01. Subject to CNSC approval through the issuance of the requested Licence, CNL will continue with activities for the WLRP, demonstrating strong, compliant licence performance while continuing with the important site decommissioning and environmental remediation work. The decision on the proposed in situ disposal of the WR-1 reactor is out-of-scope for this licence renewal request and will be considered by the Commission at a future public hearing.

During the previous licence period, CNL has made noteworthy progress with its Indigenous and public engagement activities and made progress in advancing ongoing environmental assessment work, repurposing and decommissioning structures, and conducting the assessments necessary for determining the site's restoration end-state.

Canadian Nuclear Laboratories has experienced challenges related to health and safety (e.g., pandemic response) and with compliance (e.g., Fire Protection Program) that resulted in extended pauses to work. At no time was the environment or public at increased risk. In response to the Fire Protection Program challenges, CNL took immediate corrective actions and has implemented numerous improvements to emergency management and fire protection capabilities. However, the extended pauses to work have impacted the schedule of decommissioning, and progress on activities at the WL Site is delayed. Canadian Nuclear Laboratories' focus has been on recovery from these challenges.

During the requested three-year Licence interval, CNL intends to:

- Apply continuous improvement to the Safety and Control Area compliance programs and assess for effectiveness over the short and long term;
- Finalize strategies for key decommissioning and remediation activities that will progress the WL Site toward closure;
- Continue to build on the relationships with Indigenous Nations, communities, organizations, and governments; and
- Ensure that Indigenous and public engagement will be a focus throughout the licence period.

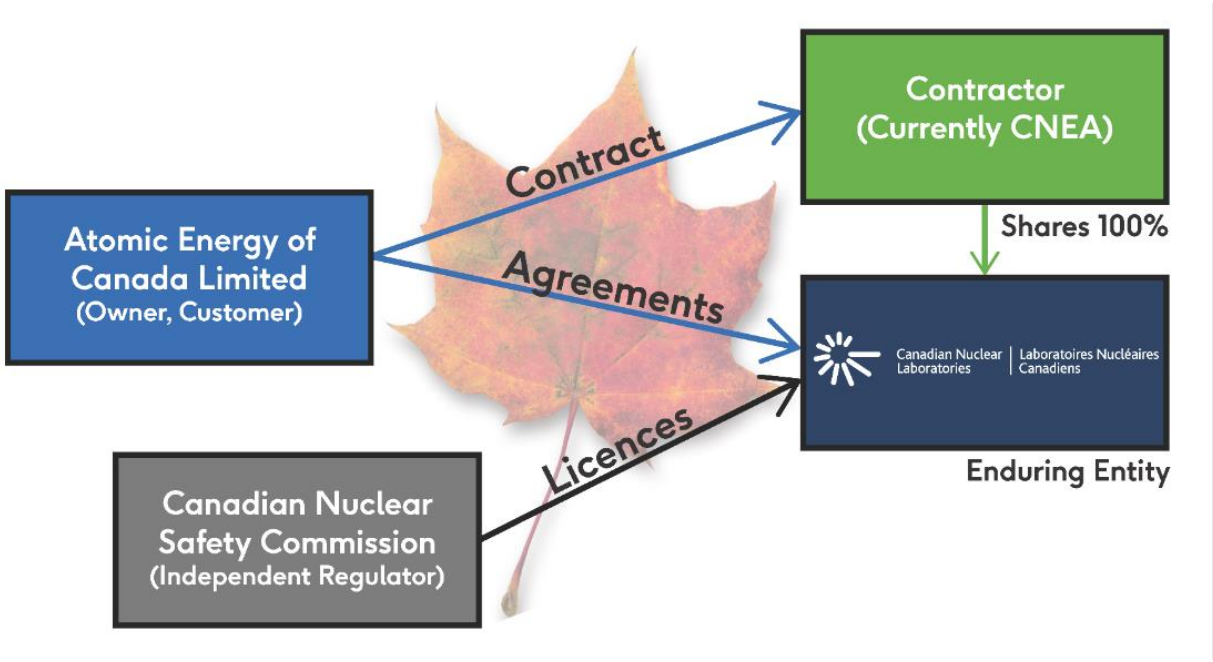
1.1.1 Management Structure

Atomic Energy of Canada Limited has contracted CNL to manage and operate its sites and facilities across Canada. Canadian Nuclear Laboratories is also contracted to carry out AECL's mandate to enable nuclear science and technology and to protect the environment by fulfilling

the Government of Canada's radioactive waste and decommissioning responsibilities. In turn, AECL sets the direction and oversees the contract.

Atomic Energy of Canada Limited delivers its mandate through a government-owned, contractor-operated model, whereby a private-sector organization, CNL, is responsible for managing and operating AECL's sites (Figure 2). Under the government-owned, contractor-operated model, AECL owns the sites, facilities, assets, liabilities, intellectual property, and responsibility for environmental remediation and radioactive waste management. Canadian Nuclear Laboratories is responsible for the day-to-day operations of the sites.

Canadian Nuclear Laboratories is the licensee responsible for the WLRP Decommissioning Licence [2] that is in place to carry out the restoration of the WL Site. As such, CNL is the proponent for the WLRP and for decommissioning associated infrastructure.



CNEA = Canadian National Energy Alliance.

Figure 2: Canadian Nuclear Laboratories and Atomic Energy of Canada Limited government-owned, contractor-operated model.

1.1.2 Whiteshell Laboratories Organization

Canadian Nuclear Laboratories is led by an Executive Team and a Board of Directors. The President and Chief Executive Officer, along with a Chief Operating Officer and Vice Presidents, are responsible for various aspects of the business. Senior leadership (e.g., Vice Presidents) is directly involved with the execution of the WLRP. A complete list of CNL's Board of Directors and Executive Team is available online at CNL Leadership Team.

The Vice President, Environmental Remediation Management and Stewardship and Renewal Group, has overall responsibility for the restoration of the WL Site. This Vice President also has responsibility for the operation of the CNL waste services, as well as the Waste Management

and Cleanup functions. Reporting to this Vice President is the WL General Manager, who is responsible for the overall site operations and restoration work, and reporting to the Deputy Vice President of Environmental Remediation Management is the WL Site Licence Holder, who is responsible for the safe and compliant operation of the facility.

The Vice President, Health, Safety, Security and Environment, has the overall responsibility for compliance programs for Health, Safety, Security and Environment Compliance. Directors, such as Radiation Protection, Environmental Protection, Occupational Safety and Health, and Fire and Emergency Management, support these compliance programs. The WLRP is conducted in accordance with CNL compliance program requirements.

The Vice President, Corporate Affairs, has the overall responsibility for the facilitation of engagement activities with the public and Indigenous Peoples to support the WLRP. Reporting to this Vice President through the Deputy Vice President, Corporate Affairs, is the Director of Indigenous Relations, who is responsible for leading Indigenous engagement activities and oversees CNL's efforts to grow its relationships with Indigenous Peoples.

The Vice President, Central Technical Authority oversees establishing, maintaining, assessing, and continuously improving the company-wide processes and programs for the following Functional Support Areas: Conduct of Operations, Fitness for Service, Design Authority and Design Engineering, Configuration Management, Pressure Boundary, Electrical Safety, Safety Analysis, Training and Development, Commissioning, Quality, Performance Assurance, Compliance, Nuclear Criticality Safety and Nuclear Materials & Safeguards Management. This role is also the Chief Nuclear Officer for CNL and is ultimately responsible to ensure compliance with CNSC license requirements at all CNL Sites.

An organization chart for the WLRP can be found in Appendix A.

1.2 Description of Whiteshell Laboratories Restoration Project

Whiteshell Laboratories was established near Pinawa, Manitoba in the early 1960s to carry out nuclear research and development activities for higher temperature versions of the CANDU® (CANada Deuterium Uranium) reactor. The initial focus of research was Whiteshell Reactor – 1 (WR-1) and the Organic Cooled Reactor concept, which began operation in 1965. This program was discontinued in the early 1970s in favour of the heavy-water-cooled CANDU system. Whiteshell Reactor – 1 continued to operate until 1985 in support of AECL research programs.

Whiteshell Laboratories is situated on the traditional lands of Treaties 1 and 3, the lands of the Anicinabe, Ojibway Anishinaabe, and the Homeland of the Red River Métis.

Its location is approximately 100 kilometres (km) northeast of Winnipeg, Manitoba, 10 km west of Pinawa, Manitoba and north of Highway 211 (Figure 3). The property measures 4,375 hectares (ha) and includes lands on both the east and west sides of the Winnipeg River. Most of the WL facilities fall within a 40 ha area adjacent to the east shore of the Winnipeg River (Figure 4). The Waste Management Area (WMA), the Concrete Canister Storage Facility (CCSF) and other facilities are located 2 to 3 km northeast of the main WL Site campus. The WL Site is at an elevation of approximately 267 metres (m) above sea level, within a broad zone

where prairie grassland to the southwest transitions into boreal forest to the northeast. The site is on the western edge of the Precambrian Shield.

As documented in the Comprehensive Study Report [1] (i.e., Environmental Assessment) on the decommissioning of WL in 2002, the AECL licensed property is delineated into two overall parts, designated as the Affected Lands and adjacent unaffected areas Figure 4. The Affected Lands, about 1,400 ha, includes buildings, spaces and lands that were, or might have been, impacted by on-site nuclear operations, as well as a buffer zone around those impacted areas. The unaffected areas contain only land that had no radiological history and was not impacted by on-site nuclear operations. The absence of radiological impacts was confirmed by a radiological verification survey performed during the summer of 2000. The unaffected areas are excluded from the scope of WL Decommissioning as defined in the Comprehensive Study Report [1].

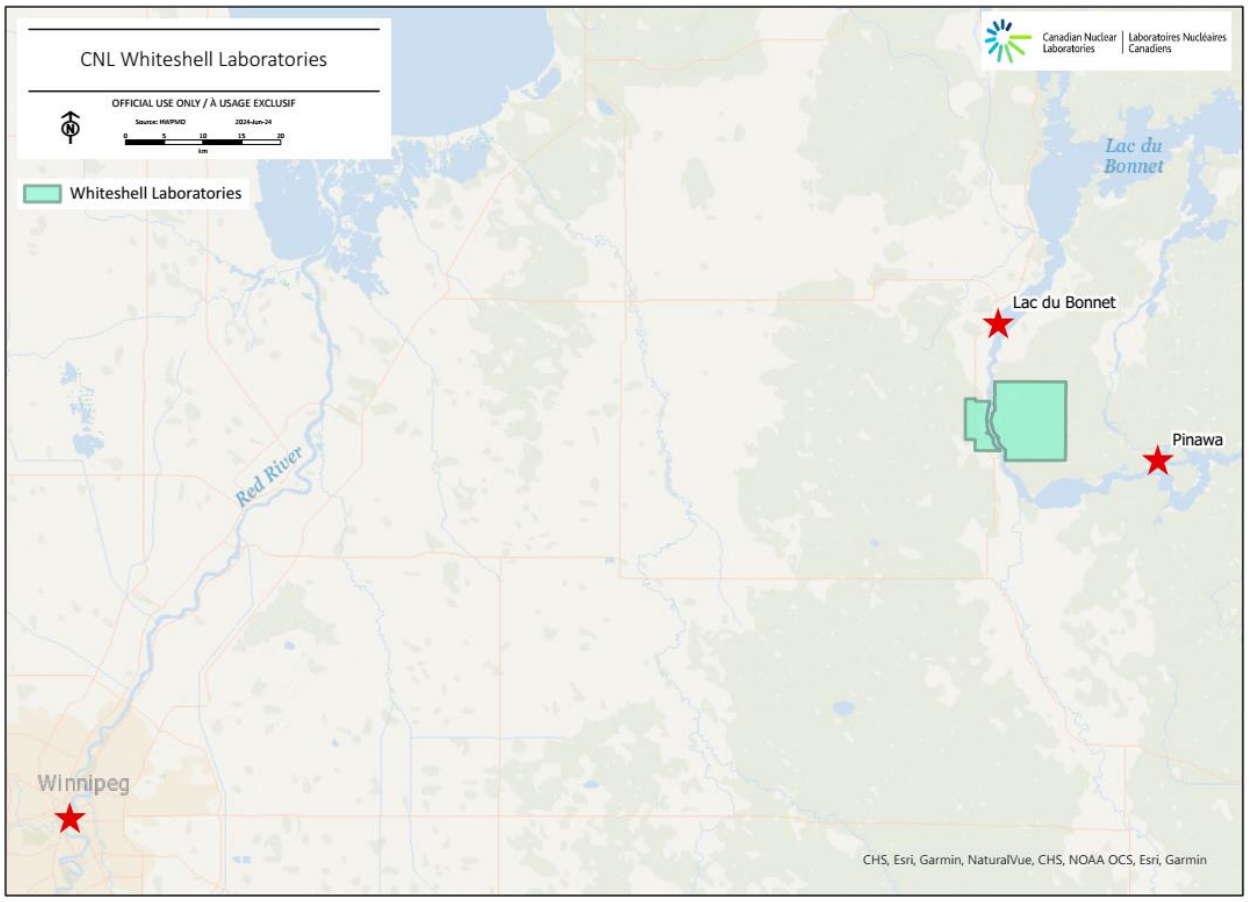
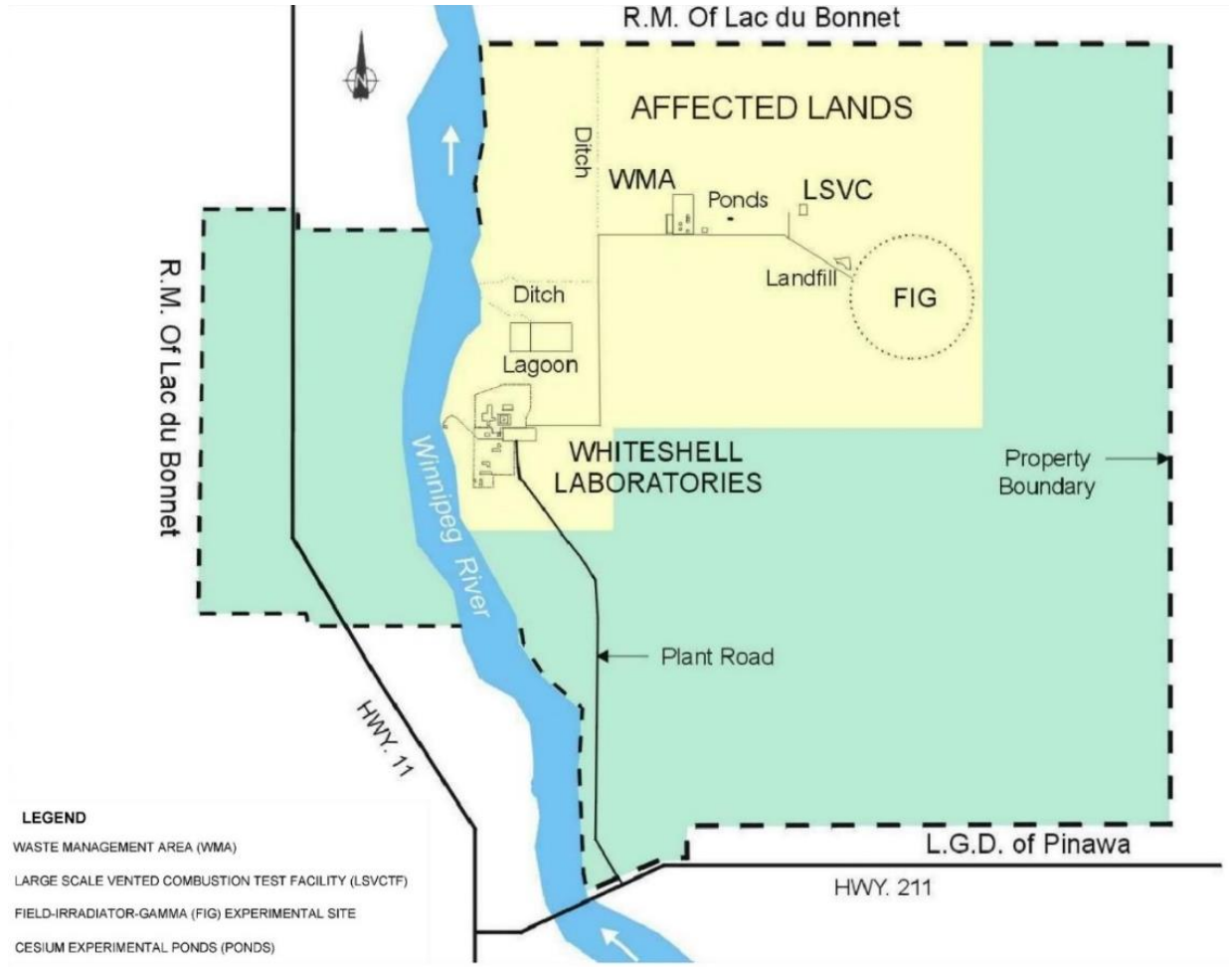


Figure 3: Map of the area of Whiteshell Laboratories Site.



LGD = Local Government District; RM = Rural Municipality.

Figure 4: Map showing the Whiteshell Laboratories Site.

2. Engagement with Indigenous Peoples

Canadian Nuclear Laboratories is committed to ongoing engagement with First Nations and the Manitoba Métis Federation (MMF) regarding current and planned activities and projects as part of its corporate, environmental, and social responsibility. Whiteshell Laboratories contains Class IB Nuclear Facilities; therefore, CNL's engagement efforts are in alignment with CNSC REGDOC 3.2.1 *Public Information and Disclosure* [4], and follow the guidance in REGDOC-3.2.2 *Indigenous Engagement* [3], as well as those found in the *Public Information Program for Canadian Nuclear Laboratories* [5].

Canadian Nuclear Laboratories continues to enhance all communications, plans and reporting to acknowledge and incorporate Indigenous rights, perspectives, values, and truths. Working in collaboration with AECL, CNL is advancing on a reconciliation journey with Indigenous communities, in part by supporting capacity building for Indigenous-led monitoring or guardian

programs and by integrating Indigenous knowledge systems into CNL project planning and activities.

Recognizing Indigenous engagement as a critical component of the WLRP, CNL acknowledges the continued need for open, honest, and transparent communication with Indigenous Peoples. An open dialogue between CNL and First Nations and the MMF is maintained throughout the engagement process, and CNL uses feedback to further refine project planning and messaging.

Over the course of engagement with First Nations and the MMF, CNL has noted preferences for communications and engagement methods, and remains open to continual refinement of approaches based on the interest and needs of each Nation.

Since 2016, CNL staff have actively participated in Indigenous awareness training, including sessions on engaging with Indigenous Peoples, cultural sensitivity, cultural awareness, the Kairos blanket exercise, and trauma-informed engagement (Figure 5).

Figure 5: Staff members participating in the Kairos blanket exercise.

Canadian Nuclear Laboratories continues to evolve its corporate Indigenous Relations Program to ensure an integrated approach across all CNL sites.

2.1 Indigenous Nations, Communities, Organizations and Governments

Canadian Nuclear Laboratories remains committed to engaging with the MMF and all First Nations that express an interest in WL projects and activities.

Over the past five years, relationships have strengthened, and engagement has evolved. It is also important to note that CNL's relationships and engagement with First Nations and the MMF are at varying stages of development and maturity. However, these relationships have significantly progressed over the current licence period, with regular communications and open dialogue, often on highly specific topics. With some, there has been less interest in engagement or more recent interest in engaging with CNL.

Canadian Nuclear Laboratories seeks to provide a forum to facilitate Indigenous awareness about ongoing activities and projects at the WL Site, and the possible effects on community members and the environment. Canadian Nuclear Laboratories also seeks to include Indigenous perspectives on traditional and current uses of land in the vicinity of the WL Site, planned and ongoing WLRP-related activities, programs, timelines, environmental protection and mitigation measures, long-term benefits, and economic opportunities.

Through engagement activities on the WLRP, CNL continues to build on years of engagement with Sagkeeng First Nation (Sagkeeng), the Black River First Nation, Hollow Water First Nation, Wabaseemoong Independent Nations, Grand Council Treaty #3, and the Red River Métis (engaged via the Government of the MMF). These relationships have evolved significantly over the past five years, with ongoing engagement on the WR-1 Project, as well as the decommissioning of the entire WL Site through the WLRP. Over the last few years, CNL has worked with First Nations and the MMF to establish substantive capacity and relationship agreements, some of which also involve AECL, to support and structure the activities and community engagement that drive these relationships forward.

During recent engagements regarding environmental assessment for the WR-1 Project, CNL heard interests and concerns that are related to the WLRP more broadly. To this end, CNL and several First Nations and the MMF are engaging on what will happen to the site in the long term through discussions around land-use and end-state (LUES) and the cleanup plan for the entire WL Site.

Of note, in 2021, CNL was exploring the opportunity to form an Indigenous Advisory Committee for the WL Site. Based on feedback received from several First Nations and the MMF, this initiative has been put on hold in favour of bilateral engagement. Canadian Nuclear Laboratories would reopen dialogue on the Indigenous Advisory Committee if there is new interest in revisiting this initiative.

Canadian Nuclear Laboratories continues to share information on WL activities and projects with the Brokenhead Ojibway Nation, Iskatewizaagegan #39 Independent First Nation, Shoal Lake 40 First Nation, Northwest Angle #33, and the Chiefs of Ontario with opportunities for further engagement available to those communities at their discretion.

More recently, Peguis First Nation (Peguis) reached out to CNL to initiate dialogue. Canadian Nuclear Laboratories continues to connect with Peguis to learn more about its interests.

Canadian Nuclear Laboratories has included the Algonquins of Pikwàkanagàn First Nation, who have an interest in the activities at the WL Site through their relationship with CNL. Waste from

the WL Site will be sent to Chalk River Laboratories, which is located within the Algonquins of Pikwàkanagàn First Nation's traditional territory.

Background information has been gathered from information sharing or public sources. A detailed summary of engagement is provided below for the MMF and each of the First Nations with which CNL has engaged.

2.1.1 Sagkeeng Anicinabe First Nation

Sagkeeng First Nation is an Anishinaabe First Nation, with traditional territory that extends across the lands and waters which make up Treaties 1, 3, and 5. Sagkeeng First Nation is located on both shores of the Winnipeg River, where it meets Lake Winnipeg, which is where the Nation's name comes from: Sagkeeng means "mouth of the river." Sagkeeng's reserve is directly downstream of WL. The Nation has an existing relationship with CNL and expressed interest in the WL Site. The WL Site is located within Sagkeeng's traditional territory, to which Sagkeeng claims unsurrendered Aboriginal title. The community has articulated to CNL that Sagkeeng's members have been impacted by the WL Site since it opened. Following the previous Licence hearing, in 2019 December, Sagkeeng and CNL met to discuss what Sagkeeng had brought forward during the hearing process. At the 2019 hearing, Sagkeeng had reiterated the position that all waste should be removed from the WL Site.

A brief list of engagement over the licence period include:

- Monthly technical working group meetings;
- Development of a community liaison position;
- Ongoing interactions for a variety of purposes, formal and informal;
- Five agreements signed between 2020 and 2023 to facilitate meaningful engagement and incorporate Indigenous concepts into WL programs (Figure 6), two of which were to direct engagement on future planning initiatives and decommissioning strategies through technical working groups;
- Several documents (including Sagkeeng's Psychosocial Impact Assessment and Sagkeeng's Alternative Means Assessment) produced by the Nation and received and recognized by CNL that have positively influenced operations and created opportunities for direct involvement in field studies; and
- Establishment of the "Niigan Aki" (meaning "Land First") guardians program for Indigenous-led environmental monitoring of WL operations.

Figure 6: Senior leadership from Atomic Energy of Canada Limited (left), Sagkeeng's Chief (centre), and Canadian Nuclear Laboratories (right) signing of a trilateral relationship agreement in December 2022.

2.1.2 Manitoba Métis Federation

The MMF is the democratically elected self-government representative of the Manitoba Métis, Red River Métis. The Red River Métis are a distinct Indigenous people whose rights have been recognized and affirmed as protected by section 35 of the *Constitution Act, 1982*, as well as by the courts, and through agreements with the Crown. The Manitoba Métis Federation represents and advances the interests of Red River Métis Citizens and harvesters that rely on and use the lands, waters, and resources of their traditional territory throughout the province of Manitoba and across the National Homeland.

Through ongoing discussions over the past five years, CNL and the MMF identified initiatives that would help address the MMF's concerns about the WLRP. As a culmination of these discussions, in 2023 August, the MMF and CNL signed a multi-year contribution agreement. This agreement established a series of ongoing engagement activities to improve communications between the parties, including an annual leadership meeting and the creation of a MMF liaison position. Other initiatives include the development of a communications protocol for reportable events, the development of plain language materials on CNL activities, and support to enable MMF participation in environmental monitoring and economic activities at the WL Site.

In 2024 February, the MMF notified CNL of the MMF's decision to end the 2023 agreement. Canadian Nuclear Laboratories respects the MMF's decision while continuing to share information. Canadian Nuclear Laboratories remains open and interested in discussion with the MMF. Canadian Nuclear Laboratories aspires to rebuild a productive partnership with the MMF to enable full participation of Red River Métis Citizens in the various projects, licensing, economic benefits and environmental protection opportunities.

The MMF and CNL have held monthly meetings for several years, which have continued into the current licence period although these meetings have ceased since 2024 February. Overall, CNL still believes the foundation of the relationship between the MMF and CNL has been enhanced over the past five years, as the MMF were engaging with CNL on key areas of interest and concern. In particular, Métis participation in WL's environmental monitoring efforts has been substantial with the involvement of the Citizen Scientists, CNL's incorporation of guidance on mushroom sampling, and the 2023 Memorandum of Agreement support for the MMF's environmental monitoring work, which has enabled the MMF-led Harvester Sampling Plan. Canadian Nuclear Laboratories anticipates that the Harvester Sampling Plan will continue to inform CNL's Environmental Protection Program for WL through the next licence period. A brief list of engagements and activities include:

- Signing of a multi-year Memorandum of Agreement contribution agreement in 2023 following a series of engagements;
- Signing of two Memoranda of Understanding in 2021 for continued involvement in environmental monitoring and species at risk sampling;
- Participation in on-site technical monitoring of waste and environmental monitoring campaigns;
- Meaningful program-level engagement for groundwater monitoring methods, environmental sampling methods, harvester sampling, and species at risk assessments; and
- Métis Cultural Awareness Training provided to CNL staff by the Louis Riel Institute.

2.1.3 Black River First Nation and Hollow Water First Nation

The Black River First Nation is an Anishinaabe community, and signatory to Treaty 5. The primary language used is Ojibwe.

Hollow Water First Nation, also known as Waanibiigaaw or Wanipigow in Ojibwe, is also an Anishinaabe (Ojibwa) First Nation and signatory to Treaty 5.

Both First Nations have potential, asserted, and/or established Indigenous and Treaty rights in the vicinity of WL.

The Black River First Nation and Hollow Water First Nation have chosen to engage jointly with CNL regarding WL. Engagement between the Black River and Hollow Water First Nations and CNL continues to create positive growth in the relationship. Canadian Nuclear Laboratories anticipates furthering the relationship into the next licence period with greater monitoring

involvement and more in-community outreach with members from the Black River First Nation and Hollow Water First Nation. A brief list of engagement activities include:

- A new relationship agreement signed in 2021 that updated the previous contribution agreement;
- CNL staff-hosted site tours, participated in community activities and led WLRP-related presentations at external venues upon request (Figure 7);
- Participation in environmental monitoring, sampling, medicinal plant reviews, and species at risk assessments; and
- Attendance at the Regional Gatherings hosted by CNL, and the Nuclear Waste Management Decommissioning Environmental Remediation conference in Niagara Falls, Ontario.

Figure 7: Representatives of Black River First Nation and Hollow Water First Nation, and the Sagkeeng Niigan Aki Program Manager, tour Whiteshell Laboratories Site in January 2024.

2.1.4 Brokenhead Ojibway Nation

The Brokenhead Ojibway Nation is an Anishinaabe (Saulteaux/Ojibwa) First Nation. The First Nation is a signatory to Treaty 1. The Brokenhead Ojibway Nation occupies three areas of

reserve lands. Brokenhead 4 Reserve No. 06361 is the largest and is situated approximately 44 km northwest of the WL Site.

Prior to 2020, the Brokenhead Ojibway Nation and CNL held some engagement activities, alongside the Black River First Nation and Hollow Water First Nation, primarily related to the WR-1 environmental assessment. However, in August 2020, the Brokenhead Ojibway Nation confirmed it did not want to participate in the Indigenous Advisory Committee, nor did it want to have an Indigenous liaison position in its community, despite CNL's offer to provide the Nation with capacity funding. The Brokenhead Ojibway Nation stated its members were content to continue to engage through the regulatory process for the WR-1 Project's environmental assessment.

Canadian Nuclear Laboratories continues to share information with the Brokenhead Ojibway Nation on activities and projects at WL, as well as invitations to meet with CNL, tour the site and share feedback on key documents and offers of capacity to support review.

2.1.5 Wabaseemoong Independent Nations

The Wabaseemoong Independent Nations (also known as Wabaseemoong Independent Nations of One Man Lake, Swan Lake, and White Dog) are signatories to Treaty 3. The Wabaseemoong Independent Nations have Indigenous and Treaty rights in the vicinity of Whiteshell Laboratories.

Canadian Nuclear Laboratories and Wabaseemoong Independent Nations have had some engagement regarding the WL Site and in 2023, Wabaseemoong Independent Nations indicated that its engagement with CNL will be through Grand Council Treaty #3.

Canadian Nuclear Laboratories continues to share information with Wabaseemoong Independent Nations on activities and projects at WL, as well as invitations to meet with CNL, tour the WL Site, and share feedback on key documents and offers of capacity to support review. Representatives participated in the two exploratory discussions on developing an Indigenous Advisory Committee for the WL Site in 2021.

Canadian Nuclear Laboratories staff have provided information, contracting opportunities, updates, and invitations.

2.1.6 Grand Council Treaty #3

Grand Council Treaty #3 is the Traditional Government of the Anishinaabe Nation in Treaty 3. Grand Council Treaty #3 represents 28 First Nations across the Treaty 3 territory. The Grand Council's mandate is to protect the future of the Anishinaabe people by ensuring the protection, preservation, and enhancement of inherent and Treaty rights. The Territorial Planning Unit is a department within the Grand Council that works with the Treaty 3 Leadership to protect the lands, water, and resources within the 55,000 square miles of Treaty 3 territory. The Territorial Planning Unit is guided by Anishinaabe Inakonigaawin - Manito Aki Inakonigaawin (Great Earth Law) and Treaty 3 Nibi (water) Declaration (Home - Grand Council Treaty #3 (gct3.ca)).

Grand Council Treaty #3 is made up of 28 First Nation communities (2 communities in Manitoba and 26 communities in Ontario). There are five member communities with potential interest in the Project including Shoal Lake 40 First Nation, Iskatewizaagegan #39 Independent First Nation, Northwest Angle #33 First Nation, and Wabaseemoong Independent Nations.

Treaty 3 territory includes parts of eastern Manitoba, including the WL Site. Within the last five years, Grand Council Treaty #3 and CNL have progressed their relationship and now have regular engagement regarding WL:

- Grand Council Treaty #3 and CNL established monthly meetings in 2022;
- Grand Council Treaty #3 representatives attended the LUES Conference hosted by CNL; and
- CNL attended the Grand Council Treaty #3 National Environmental Gathering to share information on WL programs, updates, and invitations.

2.1.7 Shoal Lake 40 First Nation

Shoal Lake 40 First Nation is an Ojibway or Ontario Saulteaux First Nation reserve located in the Eastman Region of Manitoba and the Kenora District of Ontario. Shoal Lake 40 is a member of Grand Council Treaty #3.

Canadian Nuclear Laboratories has continually reached out to Shoal Lake 40 over the past five years via correspondence and telephone calls. Shoal Lake 40 has yet to respond or indicate an interest in engaging with CNL on either the WR-1 Project or WL more generally.

Since 2020, CNL has shared information and requests for participation and feedback on the WR-1 Project, community information bulletins on the WL safety stand-down and other information, invitations to meet, information on leadership changes, the CNL Indigenous Relations Procurement Strategy, information on LUES and offers of capacity to support engagement.

Canadian Nuclear Laboratories continues to share information about ongoing and future activities at the WL Site with Shoal Lake 40 and remains open to engagement if Shoal Lake 40 expresses interest.

Canadian Nuclear Laboratories is also engaging Grand Council Treaty #3, of which Shoal Lake 40 is a member.

2.1.8 Iskatewizaagegan #39 Independent First Nation

Iskatewizaagegan #39 Independent First Nation is an Anishnaabe community located in northwestern Ontario. Iskatewizaagegan #39 Independent First Nation is a member of Grand Council Treaty #3.

Canadian Nuclear Laboratories has continually reached out to Iskatewizaagegan #39 over the past five years via correspondence and telephone calls. Iskatewizaagegan #39 has yet to respond or indicate an interest in engaging with CNL on either the WR-1 Project or WL more generally.

Since 2020, CNL has shared information and requests for participation and feedback on the WR-1 Project, community information bulletins on the WL safety stand-down and other information, invitations to meet, information on leadership changes, the CNL Indigenous Relations Procurement Strategy, information on LUES and offers of capacity to support engagement.

Canadian Nuclear Laboratories continues to share information about ongoing and future activities at the WL Site with Iskatewizaagegan #39 and remains open to engagement if Iskatewizaagegan #39 expresses interest.

Canadian Nuclear Laboratories is also engaging Grand Council Treaty #3, of which Iskatewizaagegan #39 is a member.

2.1.9 Northwest Angle #33 (Treaty 3)

Northwest Angle #33 First Nation northwestern Ontario. Northwest Angle #33 is a member of Grand Council Treaty #3.

Canadian Nuclear Laboratories has continually reached out to Northwest Angle #33 over the past five years via correspondence and telephone calls. Northwest Angle #33 has yet to respond or indicate an interest in engaging with CNL on either the WR-1 Project or WL more generally.

Since 2020, CNL has shared information and requests for participation and feedback on the WR-1 Project, community information bulletins on the WL safety stand-down and other information, invitations to meet, information on leadership changes, the CNL Indigenous Relations Procurement Strategy, information on LUES and offers of capacity to support engagement.

Canadian Nuclear Laboratories continues to share information about ongoing and future activities at the WL Site with Northwest Angle #33 and remains open to engagement if Northwest Angle #33 expresses interest.

Canadian Nuclear Laboratories is also engaging Grand Council Treaty #3, of which Northwest Angle #33 is a member.

2.1.10 Peguis First Nation

Peguis First Nation is a Treaty 1 First Nation, located approximately 163 km from the WL Site, and is the largest First Nation community in Manitoba.

Peguis First Nation reached out to CNL's Indigenous Relations Advisor on 2023 August 24 inquiring about ongoing and upcoming work at the WL Site. Canadian Nuclear Laboratories responded to coordinate a discussion.

In 2024 March, Peguis First Nation, CNL and AECL met in Winnipeg to discuss CNL activities which included an overview of CNL, WLRP, and the WR-1 Project. Peguis and CNL are currently working together to determine next steps with respect to engagement.

Canadian Nuclear Laboratories invited Peguis First Nation for a tour, which resulted in representative from Peguis First Nations visiting the WL Site in 2024 April.

Canadian Nuclear Laboratories is committed to meaningful engagement with Peguis First Nation on WL going forward.

2.1.11 Algonquins of Pikwàkanagàn First Nation

The Algonquins of Pikwàkanagàn First Nation (AOPFN) are Algonquin peoples of the Ottawa River (Kichi-Sìbì) Valley. Algonquin people have lived in the Ottawa River Valley for at least 10,000 years before Europeans arrived in North America.

The AOPFN has never ceded any traditional Algonquin territory in Treaty with the Crown. Members of the AOPFN have, since time immemorial, exercised their rights to hunt, trap, fish, gather, and perform other activities integral to their culture and way of life throughout the unceded traditional territory, including in the area where CNL's main site, Chalk River Laboratories (CRL), is located. Members of the AOPFN have long exercised governance and stewardship activities in Algonquin territory.

The AOPFN continues to exercise Algonquin Aboriginal title and Aboriginal rights to and in all parts of AOPFN unceded traditional territory, including lands under water. The AOPFN has an obligation to its members to plan for the future and to ensure self-determination, self-reliance, and self-governance. The AOPFN is committed to respecting and protecting its unceded traditional territory and the rights and interests of its members.

The AOPFN relies on the health of the environment for survival, and therefore the health of the lands and waters is essential to the continued existence of the AOPFN people. The AOPFN must be recognized — and is recognized by CNL and AECL — as a rightful, respected, and principled steward of the environment.

Since 2020, AECL and CNL have participated in extensive engagements with the AOPFN, particularly related to CNL's Near Surface Disposal Facility project. With the Near Surface Disposal Facility project, CNL has proposed an engineered containment mound to permanently dispose of one million cubic metres of low-level waste (LLW). Of this waste, up to five per cent (%) originates from WL and other AECL nuclear liabilities. As well, CNL is planning to consolidate intermediate-level waste (ILW) and high-level waste (HLW) from the WLRP in storage at CRL until disposal facilities become available.

In 2023 May, the AOPFN, AECL, and CNL signed a Long-Term Relationship Agreement (LTRA). The LTRA was the culmination of intensive efforts, negotiations, and engagement to establish a productive relationship between the owner and operator of Canada's national nuclear laboratories and the AOPFN, built on mutual respect and understanding, and cultivated through ongoing opportunities for dialogue and participation. It also partially resolves and addresses key areas of concern identified by the AOPFN, including environmental protection, radioactive waste management, cultural protection and promotion, and the pursuit of collaborative economic and business opportunities.

An important outcome of the LTRA was CNL's commitment to the AOPFN for engagement on the importation of waste from outside of AOPFN territory. The AOPFN do not endorse any importation of waste into their territory — including waste from WL.

CNL has ongoing dialogue with the AOPFN on waste management, including importation, via the Radioactive Waste Subcommittee, which was established by the LTRA.

2.2 Engagement on the Licence Renewal Process

Canadian Nuclear Laboratories provided information on the 2024 WL Licence renewal application during meetings with First Nations in 2024 February and March, including at the following meetings:

- 2024 February 07 between Sagkeeng First Nation and CNL (monthly);
- 2024 February 14 between Black River and Hollow Water First Nations and CNL (monthly);
- 2024 March 05 between Peguis Fist Nation and CNL (initial meeting); and
- 2024 March 14 between Grand Council Treaty #3 and CNL (monthly).

In 2024 March, CNL shared an email with the MMF and First Nations with interests and/or rights within the Whiteshell region.

This email contained a link to CNL's Licence application, the CNSC's Notice of Hearing and the information of the CNSC's Participant Funding Program. Canadian Nuclear Laboratories also offered a meeting and support for community participation in the licensing process.

Canadian Nuclear Laboratories also shared a similar email with Indigenous Nations, communities and organizations engaging with CNL around activities and projects at the CRL Site.

In addition, CNL had discussions and/or shared information on site relicensing during the following meetings (current to 2024 June 23):

- 2024 March 06 between Sagkeeng First Nation and CNL (monthly);
- 2024 March 20 between Black River and Hollow Water First Nations and CNL (monthly);
- 2024 March 25 between Mississaugas of Scugog Island First Nation and CNL (quarterly);
- 2024 March 27 between Hiawatha First Nation and CNL (quarterly);
- 2024 March 27 between Curve Lake First Nation and CNL (quarterly);
- 2024 April 03 between Sagkeeng First Nation and CNL (monthly);
- 2024 April 10 between Black River and Hollow Water First Nations and CNL (monthly);
- 2024 April 16 between Grand Council Treaty #3 and CNL (monthly);
- 2024 April 23 between Peguis First Nation and CNL (WL Site tour);

- 2024 April 24 between Williams Treaties First Nations and CNL (quarterly);
- 2024 May 01 between Sagkeeng First Nation and CNL (monthly working group meeting);
- 2024 May 02 Black River and Hollow Water First Nations (Core Engagement Team meeting); and
- 2024 June 04 at the Regional Gathering (annual).

Canadian Nuclear Laboratories also emailed First Nations and the MMF an invitation to the April public webinar on the WL Fire Protection Program. The beginning of this webinar was a slide highlighting how to participate in the Whiteshell Licence Renewal Hearing.

On 2024 May 15, CNL emailed an invitation to review the Indigenous engagement section of CNL's Commission Member Document ahead of CNL submitting the Commission Member Document to the CNSC:

- Sagkeeng First Nation;
- Manitoba Métis Federation;
- Black River First Nation and Hollow Water First Nation;
- Brokenhead Ojibway Nation;
- Wabaseemoong Independent Nations;
- Grand Council Treaty #3;
- Shoal Lake 40 First Nation;
- Iskatewizaagegan #39 First Nation;
- Northwest Angle #33 First Nation;
- Peguis First Nation; and
- Algonquins of Pikwàkanagàn First Nation.

In this email, CNL reiterated an offer to meet and provide capacity for hearing participation and re-shared a link to websites with information on the licensing process. Sagkeeng First Nation, the MMF, Grand Council Treaty #3, and Algonquins of Pikwàkanagàn First Nation all provided a review to CNL and comments, which were incorporated.

2.3 Future Engagement Activities Planned

Sections 2.1.1 through 2.1.11 describe engagement activities and the immediate next steps CNL is committed to with each First Nation and the MMF. These activities focus on continued relationship building, addressing ongoing interests and concerns, and involvement in environmental monitoring at the WL Site, where there is interest.

Canadian Nuclear Laboratories aims to create sustainable engagement through developing relationship agreements with work plans that support addressing an individual First Nation's or the MMF's interests and concerns regarding CNL's activities and projects at WL.

With potential First Nations yet to express interest or currently interested in engaging through Grand Council Treaty #3, CNL will continue to reach out with invitations for engagement and to share information on the WL Site and CNL's activities and projects there.

3. Public Engagement

The *Public Information Program for Canadian Nuclear Laboratories* (PIP) [5] ensures effective communication with local communities throughout the region, as well as the wider Canadian public.

Additional information regarding how the PIP meets regulatory requirements and identified activities can be found in Section 1.3 of CNL's PIP [5]. A selection of photographs showing examples of CNL's public engagement is provided in Figure 8.

Figure 8: Selected photographs of public engagement activities.

Interest in the WLRP often spans national and international borders, as this project is the first of its kind in Canada. Canadian Nuclear Laboratories is committed to sharing information with the public in a manner that earns trust, identifies and understands issues and values, and builds and maintains community support for the WLRP. Ongoing dialogue and opportunities to provide feedback ensure that members of the public and other participants are knowledgeable about upcoming work and project activities, and that questions, issues and concerns are identified and addressed.

3.1 General Information

In accordance with the CNSC REGDOC-3.2.1 *Public Information and Disclosure* [4] and CNL's PIP [5], CNL continues its work to build relationships and understanding of CNL and the WL environmental remediation mission. Throughout the current licence period, CNL used webinars, site tours, participation in community events, meetings, presentations, and other modes of dialogue, such as newsletters, to share updates and receive feedback.

3.2 Outreach and Engagement

Canadian Nuclear Laboratories shares information with the public through hosted webinars, a virtual visitor centre, media releases, the corporate website, a toll-free line, social media accounts, and involvement in community events. Canadian Nuclear Laboratories also provides presentations to varied audiences including all levels of government, local residents, community groups, service clubs, and local/national/international audiences.

Guided tours of WL, led by CNL's subject matter experts, provide a first-hand look at the decommissioning, waste management, and environmental protection work, promoting an in-depth understanding and appreciation for the complexity of the ongoing work. Canadian Nuclear Laboratories' *Whiteshell Contact* and *Kids Contact* newsletters highlight CNL's ongoing commitment to safety and provide updates to the community on upcoming and planned work, changes to planned work or programs, and in-depth descriptions of activities. Newsletters are distributed by mail and email and posted on cnl.ca.

3.2.1 Public Liaison Committee

Established in 2003, the Public Liaison Committee meets twice annually. The objective of the Public Liaison Committee is to build working relationships and create opportunities for open dialogue between various stakeholders, local communities, and CNL. Members include local elected officials and staff from related provincial government departments.

During regularly scheduled meetings, Public Liaison Committee members are presented with information about the WLRP, updates on the WR-1 Project, and environmental practices. Members and are given the opportunity to ask questions, seek clarification, raise concerns, and discuss the information presented. Public Liaison Committee members are also asked to take meeting information back to their respective constituents. Meeting notes are taken to record all questions and actions raised during each meeting. Guided tours of the WL Site, including areas of interest such as the WMA, are provided following many of the meetings.

3.2.2 Whiteshell Community Regeneration Partnership

The Whiteshell Community Regeneration Partnership (the Partnership) was formed in 2015 by the Local Government District of Pinawa and neighbouring municipalities. The Partnership addresses the economic concerns of the local municipalities that have historically had residents working at WL and is driven by a desire to encourage post-closure economic development. According to the Terms of Reference from 2015 October 21: "The proposed mandate of the Community Regeneration Partnership will be to develop a socio-economic plan for the vicinity

of the region affected by the WL decommissioning activities, to subsequently implement the plan and to review, update and report on the plan annually." Overall, the goal of the Partnership is job creation, replacing the employment that has been and will continue to be lost as decommissioning is completed. The Partnership consists of six municipalities, three economic development organizations, Sagkeeng First Nation, CNL, and AECL.

Canadian Nuclear Laboratories' involvement in the Partnership includes:

- **Listening to members:** Canadian Nuclear Laboratories actively engages with members with the goal of hearing and understanding their priorities and concerns regarding the WL Site;
- **Data integration:** Canadian Nuclear Laboratories will provide requested data to the Partnership to provide the region and the socio-economic plan with details such as annual and five-year rolling forecasts of employment levels and external contracting needs;
- **Regional educational and outreach programs:** These programs provide CNL employees and the regional workforce with an opportunity to improve their employment skills with educational assistance and access to internal CNL training and outside training and reskilling programs, including programs related to (e.g., decommissioning and waste management), and unrelated to decommissioning objectives (e.g., new business incubation);
- **Regional purchasing programs:** Canadian Nuclear Laboratories develops multiple programs to support the regional supply chain so the region can benefit from the extensive work scope to be accomplished at the WL Site and to establish a supply chain that will be sustainable after the WL Site has been decommissioned; and
- **Community support:** Canadian Nuclear Laboratories sponsors specific regional community activities and not-for-profit organizations and supports individual employees that are available to participate in regional activities and organizations.

As a result of the Partnership, a regional business incubator program called North Forge East (recently rebranded as Innovate Eastman) has been set up in the Local Government District of Pinawa and is funded by the Canadian National Energy Alliance. Canadian Nuclear Laboratories meets with and participates in the business incubator activities, which have included on-site events, presentations, and tours related to the WLRP. In addition, and to date, CNL has introduced representatives from Sagkeeng First Nation, the Black River First Nation, the Brokenhead Ojibway Nation, Hollow Water First Nation, and the MMF to the Partnership.

The Partnership provides another venue for communication to the public about WL and to receive feedback as well. During meetings, Partnership members are presented with information about the WLRP (including the 2023 WL safety stand-down and potential future land-use), the WR-1 Project, and CNL's environmental practices. They are given the opportunity to ask questions and discuss the information presented. Several guided tours have been provided to the Partnership members since the Partnership's inception.

3.2.3 Municipal Liaison

Canadian Nuclear Laboratories regularly engages with the rural municipalities, including the Town and the Rural Municipality of Lac du Bonnet and the Local Government District of Pinawa,

the Town of Powerview – Pine Falls, and the Rural Municipality of Alexander. Elected officials from the nearest communities are also members on the Public Liaison Committee.

Within the current licence period, CNL has made a particular effort to engage the rural municipalities. In spring of 2023 and 2024, CNL staff attended meetings at municipalities in the surrounding area to share information on the LUES engagement and seek feedback on the draft LUES Plan. Canadian Nuclear Laboratories attended council meetings in the Local Government District of Pinawa, the Town of Powerview – Pine Falls, the Rural Municipality of Lac du Bonnet, the Town of Beausejour, the Town of Lac du Bonnet, and the Rural Municipality of Whitemouth.

Canadian Nuclear Laboratories also hosted regional leader gatherings in 2023 May and 2024 June. Although the council updates focused on the LUES for the WL Site, after conducting a public survey at the end of 2022, it was determined that the public generally see the WL Site as a whole, not as separate projects. Therefore, CNL staff were prepared to answer questions about WR-1, waste management, and environmental and radiation protection.

3.3 Engagement Methods

Canadian Nuclear Laboratories uses a variety of methods to engage the public as outlined below.

Presentations

Canadian Nuclear Laboratories uses presentations to help share information, build awareness, and facilitate learning about the WLRP and hosts tours of the WL Site for government representatives, stakeholders, and interested members of the public (Figure 9).

Figure 9: Presentation at the 2024 Regional Gathering to provide information and gather input.

These presentations and tours provide an opportunity for a general overview of the WLRP and foster information sharing and open dialogue between CNL and stakeholders about the various projects that make up the WLRP. These visits are used as one of several means of engaging with stakeholders and generate discussion that helps to inform the WLRP throughout the regulatory process (Figure 10).

Figure 10: Example of information flow and feedback obtained during the 2024 Regional Gathering.

Virtual Visitor Centre

The virtual visitor centre is a website that focuses on the WLRP, addresses public concerns heard in pre-engagement, and answers questions received during the 2022 telephone survey. The WL Site also has many opportunities for visitors to ask questions and send feedback about the WLRP and the future of the WL Site.

The website was advertised in local magazines, including Discover Lac du Bonnet and Lac du Bonnet Living, in the CNL LUES brochure that was handed out at events, and in the Lac du Bonnet Clipper newspaper. The website can be found at www.engagewithcnl.ca/whiteshell.

Online Seminars (webinars)

An online seminar, or webinar, is an internet-based interactive forum that enables information sharing and two-way dialogue between CNL and the public. Webinars have the advantage of allowing people to participate from anywhere. The cost and time associated with travel to an alternative engagement activity is eliminated. Anonymous participation is possible if desired by participants.

Beginning in 2022, WR-1 and the Nuclear Power Demonstration Closure Project hosted combined webinars approximately every two months, which increased visibility of the WR-1 Project and more broadly the WLRP. Canadian Nuclear Laboratories will continue to host webinars for public information and engagement. All webinars are advertised in local papers and on CNL's social media channels. All webinars are available in both official languages and posted on CNL's YouTube page.

Canadian Nuclear Laboratories hosted 12 webinars featuring WL in the current licence period.

Breakfast Sessions

A series of technical Breakfast Sessions was held late 2019 and 2020 in person, changing to an online seminar later in 2020 because of COVID-19 restrictions. These sessions provided an opportunity to share the technical details of the WLRP with interested participants, as well as respond to questions and receive feedback. A total of four Breakfast Sessions were conducted in the current licence period.

Internal Engagement

To reach internal stakeholders (employees), different methods are employed including myCNL TV broadcasts, these are live broadcasts like the webinars that are distributed via CNL's intranet, employee information sessions, "lunch and learns," and content distributed via internal newsletters and intranet content. Weekly all-staff meetings are held at WL each Thursday to keep staff informed. Questions can be submitted anonymously by staff at stations located around the site or through instant messaging during meetings. Senior leadership answers these questions at the all-staff meetings. Whiteshell Laboratories also relaunched the internal employee newsletter, specifically for WL staff, called "The Loop" in 2022 October. The newsletter is distributed to staff quarterly.

Whiteshell Laboratories is prioritizing enhanced internal communications with a renewed focus on fostering stronger connections across the site. Recognizing valuable feedback from a Listening Campaign conducted in 2024 April and May about the need for improved communication, CNL is developing a comprehensive internal communications strategy aimed at facilitating cascading communications and building better relationships between departments and individuals across different work areas. In addition to revamping communication strategies, CNL is actively organizing more in-person events and workshops designed to encourage staff interaction and collaboration, and promote a cohesive work environment.

The "Our House" in-person all staff meeting was held on 2024 May 23 in Beausejour. The purpose was to bring all staff together in a fun, informative day to benefit morale and culture.

Workshops were held in 2024 June with WL departmental groups to help team-build and develop departmental values and culture statements. The workshops are part of a series that will continue in the fall of 2024.

Alumni Event

On 2023 December 7, CNL Alumni attended a meeting in Pinawa, hosted by CNL. The afternoon began with setting the context with current developments at the WL Site by CNL staff including

discussion of the draft LUES Plan, and a presentation by Sagkeeng Anicinabe First Nation's Niigan Aki Program Manager about the community environmental monitoring program developed and administered by Sagkeeng First Nation with support from CNL and AECL.

The group was then guided through breakout discussions about four predetermined topics to share their views: 1) Restoration and Waste Management, 2) Economic Opportunities in the Region, 3) WR-1 Decommissioning, and 4) Future of the Site and Legacy.

Web Page Content

Canadian Nuclear Laboratories has a dedicated web page for WL within the corporate website. It can be found at Whiteshell Laboratories Decommissioning - Canadian Nuclear Laboratories (cnl.ca). This page has information on the decommissioning of buildings at the WL Site and associated projects including WR-1, which has its own page at www.cnl.ca/wr-1, which includes an online feedback form. The web page also contains information related to the 2024 licence renewal hearing. There are also quick links to related videos and presentations.

Newsletter

The *Whiteshell Contact* newsletter is mailed to approximately 8,100 homes in the vicinity of the WL Site and is available on Home - Canadian Nuclear Laboratories (cnl.ca). This publication informs the reader on activities undertaken at the WL Site with a focus on safety and profiles CNL's community activities.

In 2023, CNL also began sharing the *Kids Contact* newsletter in the region to engage youth on the science and technology related to CNL's work across all our sites.

Emails

Emails have been used to connect with internal and external audiences. Emails were sent out to promote different events and to provide responses to questions submitted electronically. Individuals are encouraged to be added to an email distribution list to receive notices of upcoming events related to the project (e.g., webinars, breakfast briefings).

Advertising

Canadian Nuclear Laboratories has used many different means of advertising including advertisements in local newspapers, radio advertisements, flyer inserts in local distributions and social media posts to publicize webinars, and the virtual visitor centre.

Social Media

Social media is used to share information and increase awareness about CNL activities, including events and to receive feedback.

Facebook is the largest with the strongest engagement through "comments, shares and likes" of posts. When CNL wished to raise the profile of project events or information, "boosted" posts were used to target by location and demographics. Boosted posts are paid posts through Facebook. Social media platform X (formerly Twitter) has not been used as broadly as other platforms as Posts/Tweets have been found to receive little traction, and comparatively CNL has a much larger Facebook following. While numbers are significantly larger on LinkedIn, the

demographics are far more industry based, rather than public based. Therefore, CNL utilizes LinkedIn, but in a much lower capacity than Facebook to ensure engagement is a balanced approach with the public in comparison to those actively part of the nuclear industry. YouTube has also been used successfully to engage with stakeholders. Webinars have been posted on YouTube for future access by the public.

To support the projects at the WL Site, CNL has used social media to promote events, share and receive information, and engage with the public. Social media has been an effective tool to reach and engage stakeholders. For example, CNL's post on 2020 April 16, sharing the support the WL team was giving to the COVID-19 response, had an elevated level of engagement.

Media

Canadian Nuclear Laboratories responds to media requests in a timely manner and facilitates interviews with subject matter experts to assist the public in accessing facts about WL activities and projects. Media coverage related to WL from the current licence period is shown in Table 1.

Table 1: Media coverage during the licence period.

Date	Article	Publication
2020 July 30	Nuclear Waste Disposal Plan Fuels Frustration	*Winnipeg Free Press*
2021 January 20	O'Regan all in on unnatural resources	*Winnipeg Free Press*
2021 January	Canada's Radioactive Waste Policy Review	Pinawa Community Newsletter
2021 March 18	CNL contributes to Pinawa daycare upgrades	*The Clipper*
2021 April	Canada's Radioactive Waste Policy Review	Pinawa Community Newsletter
2022 July 20	CNL moves forward on Whiteshell decommissioning	*North Renfrew Times*
2023 May 11	Whiteshell Labs Work Stood Down for Review	*The Clipper*
2023 May 16	Fire safety staff from Chalk River now in Pinawa at Whiteshell Laboratories	*CBC Radio*
2023 May 23	Whiteshell Laboratories — 60+ Years of History	*Discover Lac du Bonnet Magazine*
2023 August 04	Decommission work halted at old nuclear facility in Whiteshell	*Winnipeg Free Press*
2023 August 05	Work Halted to Decommission Nuclear Research Facility Due to Deficient Emergency Protocols	*EnergyPortal.eu*
2023 November 13	Canadian Nuclear Laboratories fined for failing to comply with terms of [Nuclear Safety and Control] Act	*Winnipeg Free Press*
2023 December 13	CNL resumes work at Whiteshell	*North Renfrew Times*
2023 December 13	Whiteshell Labs Employees Return to Work	*The Clipper*
Date	**Opinion**	**Publication**
2020 February 03	Reliable energy	*Winnipeg Free Press*
2021 March 24	Who decides where nuclear waste goes	*Winnipeg Free Press*

2021 March 26	Nuclear waste solution	*Winnipeg Free Press*
2021 April 12	Reforms needed at Canadian Nuclear Safety Commission, say activists	*Hill Times*
2023 March 01	No such thing as "absolutely safe" reactor	*Winnipeg Free Press*
Date	**CNL Media Release**	**Publication**
2022 July 11	WR-1 Closure Project submits the revised draft Environmental Impact Statement (EIS)	Cnl.ca News
2022 December 12	We want to hear from you!	Cnl.ca News
2023 January 19	WR-1 EIS Passes Completeness Check	Cnl.ca News
2023 March 23	Majority of residents view CNL as a trustworthy, capable and transparent in the operation of the Whiteshell Laboratories site, new survey reveals	Cnl.ca News
2023 August 9	The Manitoba Métis Federation and Canadian Nuclear Laboratories sign five-year contribution agreement	Cnl.ca News

Public Attitudes Survey

Canadian Nuclear Laboratories engaged a consultant to conduct a public attitude survey in 2022 December. The purpose of the survey was to gauge public opinion and understanding about the WLRP. Results indicated positive attitudes towards CNL and the WLRP.

Completed by phone with 368 residents in Eastern Manitoba, the public attitude survey revealed that 60% of respondents view CNL as trustworthy, 59% view CNL as capable, and 56% view CNL as transparent. The survey also found that 51% are very or somewhat familiar with CNL, 62% are familiar with the WL Site, 60% consider CNL very or somewhat approachable, and 53% believe that CNL is somewhat or very committed to the best interests of the region.

Results showed that people in the communities surrounding the WL Site are most concerned about the environmental impact of the decommissioning process, particularly the effects on plants and wildlife, and how nuclear waste will be managed. They are also worried about the economic impact on local jobs. Canadian Nuclear Laboratories uses the results of the public attitude survey to tailor its communications and engagement approach. Canadian Nuclear Laboratories repeated a similar public attitudes survey in early 2024, results are pending.

3.4 Special Events in the Community

One approach to sharing information, hearing feedback, building awareness, and facilitating learning opportunities during the current licence period was to have CNL representatives attend community events local to WL. Canadian Nuclear Laboratories representatives were available to answer questions, collect feedback, and provide information about the WL Site and associated projects and activities. Canadian Nuclear Laboratories had staff and information available within the community at the special events listed in Table 2.

Table 2: Community event participation.

Date	Activity
2020 August	CNL booth at the Lac du Bonnet Night Market
2020 September	CNL booth at the Lac du Bonnet Home and Cottage Expo
2022 September	CNL Whiteshell booth at FireCon in Thunder Bay, ON
2023 May	CNL booth at the Lac du Bonnet Home and Cottage Expo
2023 June	CNL Regional Leadership Gathering in Brokenhead Ojibway First Nation
2023 July	CNL booth at Pinawa's 60th Birthday
2023 December	LUES Alumni Event in Pinawa
2024 February	Lac du Bonnet Ice Fishing Derby Sponsorship
2024 April	CNL Booth at Lac du Bonnet Job Fair
2024 June	CNL Regional Leadership Gathering in Beausejour
2024 June	CNL Booth in Lac du Bonnet Outdoor Expo

3.5 Public Information Program Evaluation and Improvement

Canadian Nuclear Laboratories is committed to conducting all our operations in a safe and responsible manner, in compliance with and under a well-established quality program outlined in the PIP [5]. As required by the PIP [5], CNL regularly reviews the Public Information Program as it progresses. Effectiveness is measured based on public input and other factors. Revisions to the program may be required to consider input from the public, to adapt to changing business needs or circumstances, to accommodate the latest information, or in response to other factors.

Through the program, CNL is committed to actively seeking public feedback to improve public engagement. Canadian Nuclear Laboratories' engagement activities for WL were assessed based on the level of participant satisfaction, audience representation, level of engagement with subject matter experts, and level of increased understanding of community and public issues. The findings of the self-assessment, along with public feedback, guide CNL's planning for future engagement activities.

3.6 Future Engagement Activities Planned

This section details how CNL will continue to engage the public, including local elected officials, industry, and non-governmental organizations, through a variety of mechanisms – demonstrating transparency and access to information. Canadian Nuclear Laboratories will continue to promote all milestones and noteworthy events through public information sessions, site tours, meetings of the Public Liaison Committee, and engagement with First Nations and the MMF. Canadian Nuclear Laboratories will continue to use social media to engage the public on CNL's WL operations, projects, and activities, as well as on planning for the future LUES of the WL Site.

Planned future engagement activities include:

- Community information sessions;
- WL Site tours;
- Participation in special community events;
- Regular website review and content update with current information added as it becomes available;
- Semi-annual Public Liaison Committee meetings;
- Bi-monthly webinars;
- Public polling; and
- Semi-annual *Whiteshell Contact* newsletters, including *Kids Contact*.

4. Whiteshell Laboratories Restoration Project

The WLRP has been focused on three main operational elements: compliance verification across Safety and Control Areas (SCAs); planning/procurement for ongoing and future decommissioning projects; and active decommissioning and waste transfer. Canadian Nuclear Laboratories' efforts have been successful in obtaining an overall reduction of hazards on the WL Site. This has been achieved through ongoing promotion and retention of a positive nuclear safety culture and by reducing the potential for adverse effects on the environment, public, and workers through proper planning and execution. Decommissioning of both nuclear and non-nuclear facilities has continued during the current licence period, 2020 January 01 to 2024 December 31. There were no new licensed activities that required notification to, or approval by, the CNSC during the licence period. A recent aerial photograph of the WL Site is provided in Figure 11.

Figure 11: Aerial view of the Whiteshell Laboratories site in 2024 June.

4.1 Progress during Current Licence Period (2020 to 2024)

Over the current licence period, the WLRP has experienced successes and setbacks. As a result of setbacks, planning and planned activities have progressed more slowly than anticipated. Canadian Nuclear Laboratories' response to COVID-19 and other safety stand-downs demarcate the periods of reduced productivity. Overall, all facilities on the WL Site were operated safely to ensure that potential radiation hazards were kept as low as reasonably achievable (ALARA) for the public, workers, and the environment. During the stand-downs, WL continued to maintain the minimum staffing requirements for compliance and safety support.

Despite some challenges, efforts toward hazard reduction were made while implementing the WLRP decommissioning strategy. Decommissioning highlights during the current licence period include:

- Shut-down of the operations in Building 200, the Active Liquid Waste Treatment Centre (ALWTC); the building was demolished in 2021 October;
- Continued characterization of WR-1 reactor components, as well as hazard reduction activities such as removal of asbestos;
- Preparation of a Recoverable Surface Storage and Staging Area, which was placed into service in early 2022 to enable safe, interim storage and handling of waste containers;
- Operational cleanout of the health and safety facilities, and demolition of Buildings 402 and 305;
- Demolition of non-nuclear facilities (Containment Test Facility [Building 303] and Waste Clearance Facility [Building 304]), in 2020;
- Removal of waste from Shielded Modular Above Ground Storage (SMAGS) in preparation for the conversion of the building into a Cask Loading Facility;
- Shut-down of Building 405 (Lunchroom/Offices, formerly the library) and operational cleanout in preparation for its demolition;
- Construction of an office trailer complex on the main campus; and
- Design and construction of decommissioning equipment to support waste retrieval and characterization and packaging of waste materials from the standpipes and ILW Bunkers.

Performance highlights for 2020 to 2024 activities:

- Licensed activities continued to be carried out safely and securely;
- No member of the public received a radiation dose that exceeded any regulatory limit;
- No WL worker received a dose in excess of any of the applicable radiation dose limits for radiation workers, as defined in the Radiation Protection Regulations;
- All releases of radioactive material in WL effluents during this licence period were below their respective derived release limits; and
- The WL Site maintained safe and compliant performance under COVID-19 pandemic conditions and protocols. As a result of the COVID-19 pandemic and in alignment with

actions recommended by the Canadian government and public health authorities, CNL opted to reduce operations at the WL site beginning 2020 March 18. The reduced operations state meant that only the work necessary to ensure that WL facilities, equipment and grounds were maintained and kept safe and compliant with regulatory requirements was conducted. Canadian Nuclear Laboratories actively addressed COVID-19 pandemic concerns and implemented numerous mitigating measures aligned with public health protocols to prevent or limit the spread of the COVID-19 virus.

Sections 4.1.1 to 4.1.7 provide more detail on the activities performed during the current licence period.

4.1.1 Shielded Facilities

The WL Shielded Facilities (SF) consists of the Hot Cell Facility (HCF) and the Immobilized Fuel Test Facility (IFTF). The SF is in the Research and Development Facilities Complex (Building 300) and is operated by personnel in the Site and Nuclear Operations Branch. There were no program or organizational changes for the SF during the current licence period.

The HCF Cells 1 to 5 and IFTF Cell 13 remain operational, while HCF Cells 6 to 11 have been shut down and partially dismantled. The waste handling area, located in the IFTF, was operated for compaction and assaying of radioactive waste.

Operations and decommissioning activities were conducted throughout the current licence period. Operations activities included:

- Maintenance of HCF and IFTF ventilation system equipment;
- Replacement of High Efficiency Particulate Air (HEPA) filters;
- Packaging and storage of radioactive waste;
- Cleanup activities; and
- Routine maintenance to ensure compliance with the Licence.

The waste handling area processed wastes generated at SF, as well as from other on-site nuclear facilities and decommissioning projects.

4.1.2 Whiteshell Reactor – 1

The WR-1 facility is in a shut-down, de-fuelled, and partially decommissioned state. It is described in *The WR-1 Reactor Phase 1 Decommissioning Project Interim End-State Report – Facility Description* [6]. The facility is monitored and maintained as defined by the *Storage with Surveillance Plan for Whiteshell Laboratories Building 100 – Whiteshell Reactor – 1* [7].

During the current licence period, the operations status of WR-1 remained unchanged. There were no changes to the reactor's equipment.

The decommissioning strategy for WR-1 was changed in 2016 from the approach described in the 2002 Comprehensive Study Report [1]. The new approach accelerates decommissioning through the implementation of demolition and in situ disposal. It was determined that an

environmental assessment and licence amendment was necessary. The environmental assessment is being conducted under the *Canadian Environmental Assessment Act 2012*.

The WR-1 Project's draft Environmental Impact Statement (EIS) was submitted (Figure 12) and has passed the CNSC's completeness check and entered the final technical review stage. Canadian Nuclear Laboratories is preparing revised responses to all outstanding information requests and comments from the Federal Provincial Indigenous Review Team. The submission of revised dispositions to comments is planned to be complete in the summer of 2024. Once responses meet reviewer expectations and the final EIS and supporting documents and documents required for licensing are deemed complete by CNSC staff, CNL will apply to amend the Nuclear Research and Test Establishment Decommissioning Licence for WL [2] to the Commission for consideration a future public hearing.

Figure 12: Photograph of the Whiteshell Reactor – 1 Environmental Impact Statement preparation team celebrating the submission.

4.1.3 Active Liquid Waste Treatment Centre

The ALWTC was operated in Building 200 until 2020. While in operation, the routine poly-alpha-olefin testing of the exhaust HEPA filter was carried out. The test results were presented in the annual compliance monitoring reports.

In 2020 October, the operating systems in Building 200 were shut down and isolated (i.e., ventilation and compressed air systems). The demolition of the building started later in October. The demolition of the ALWTC (Building 200) above grade was mostly completed in 2021 October, reducing the site's liabilities. The demolition footprint remains fenced and protected. The fence will be maintained until the potentially contaminated ground can be remediated.

4.1.4 Concrete Canister Storage Facility

Concrete storage canisters located at the CCSF have been used since 1975 to store irradiated fuel; there are currently 16 canisters in use. Each canister has a closed air-circulating system to allow monitoring of the internal space between the canister liner and the sealed fuel basket for the presence of fission products and moisture.

During the current licence period, routine operations in the CCSF have been carried out by CNL staff in the Site and Nuclear Operations Branch. All routine maintenance for systems required to be operational was carried out per the facility maintenance plan. The following equipment tests and compliance monitoring were conducted:

- All canisters were checked annually for deviation from vertical;
- Air monitoring was conducted on each of the canisters in the CCSF. This involved an air pump that circulates air from an outlet line on the canister through a Dexter filter and returns it through an inlet line. These readings were taken once per month over a period of approximately one work week during warm weather months. Typically, this is the six months of the year when air temperatures are normally above zero. As of 2022, the air line in Canister C8 has been blocked and air samples cannot be obtained from that canister;
- Visual observations (spallation surveys) were made of each canister quarterly to assess concrete condition;
- Gamma exposure rates from the canisters were measured quarterly;
- Groundwater samples from deep-well sites in the vicinity of the CCSF were obtained twice a year;
- Surface water measurements were obtained from compliance monitoring ditches. The frequency of surface drainage sampling is controlled by the amount of spring runoff and the amount of rainfall throughout the spring-to-fall period; and
- Monthly housekeeping and fire prevention inspections were conducted.

In 2020, the accessible basket parts were examined using a remote borescope camera. The results of the monitoring and inspections are provided in the WL annual compliance monitoring reports.

The fuelled canisters are inspected for cracking or spallation of concrete. When required, selective patching is done of the pour pockets. Coating of canisters is done as required to further protect the concrete from weather and maintain fitness for service. No increased radiation field was noted from the canisters. There were no canister loading or unloading operations during the current licence period.

No program changes were made for the CCSF during the current licence period. A revised Facility Authorization document and a Nuclear Safety Note for initial uranium oxide fuel retrieval were written and both were accepted by CNSC staff.

4.1.5 Waste Management Areas

Waste Management Areas are subject to ongoing compliance monitoring. An aerial view of the WL WMA is presented in Figure 13.

Figure 13: Aerial view of the Whiteshell Laboratories Waste Management Area in 2024 June.

During the licence period, monitoring included the following activities:

- Surface drainage water samples from compliance monitoring ditches were initially analyzed for gross beta, gross alpha, and tritium. If the alpha activity in the surface water was above 0.5 becquerels per litre (Bq/L), the sample was submitted for gamma spectrometry and uranium analysis. The frequency of surface drainage sampling was controlled by the amount of spring runoff and the amount of rainfall throughout the spring-to-fall period;
- Water samples were collected from wells in and around the WMA in the spring and fall;
- Water samples were collected from a series of shallow near field wells adjacent to the ILW Bunkers;
- The high-level liquid waste tank tray water was monitored to confirm there is no leakage from the residue remaining in the storage tanks. This was sampled in the summer months;
- Radiation field measurements were taken semi-annually at established points (normally every 38 m) along the perimeter fence, as well as within the WMA;
- Vegetation sampling was carried out at monitoring locations within the WMA;
- Filled storage facilities with accessible drainage sumps were inspected monthly during the summer months, when water ingress is most likely;

- Annual inspections of the visible outer surfaces of WL WMA concrete bunkers were completed;
- ISO containers (i.e., intermodal containers that meet International Standard Organization [ISO] standards) with waste being held pending shipment were inspected monthly;
- Quarterly inspections of the perimeter fence were completed; and
- Monthly housekeeping and fire prevention inspections were conducted.

While tritium is elevated at some locations in the WMA ditches, periodic monitoring of the ditches beyond the immediate WMA area has indicated that the levels of tritium at the points leaving CNL property remain quite low. Note that the elevated tritium occurrences around the WMA are not at all measurement points. There were no radioactive and/or hazardous effluents (i.e., liquid or gaseous) released into the environment from the WMA as part of routine operations.

For the near field well monitoring around the ILW Bunkers, the water sample analysis indicated no migration of cesium-137 (Cs-137) from the ILW Bunkers. Levels of strontium-90 (Sr-90) were orders of magnitude below the levels observed in the water in the adjacent ILW Bunkers. Other than at ILW Bunkers 3 and 5, tritium was also orders of magnitude below the internal bunker water samples, and ILW Bunkers 3 and 5 were still below the internal values measured.

At ILW Bunker 2, the tritium results have increased to 7,738 Bq/L. At ILW Bunker 3, the tritium results remain elevated (76,569 Bq/L, but that is a drop from a maximum of 150,411 Bq/L in 2022) and indicated a maximum of 10,345 Bq/L at ILW Bunker 5. There is no evidence that would lead CNL to conclude there is currently any significant contaminant migration pathway from the ILW Bunkers. Notably, results from wells farther from the bunkers show much lower levels of tritium.

No program changes were made for the WMA during this licence period. The Safety and Hazards Analysis document for the SMAGS facility was removed from use as the structure is being converted for use as a Cask Loading Facility. A Nuclear Safety Note for the manual retrieval of material from 21 non-fissionable material-bearing standpipes at the WL WMA was sent to the CNSC, comments were addressed and were acceptable, and a revised copy will be sent in 2024, which will enable this work to proceed. The Recoverable Surface Staging and Storage Area inside the WMA footprint, which is a gravel pad for ISO container loading and storage, went into service.

4.1.5.1 Standpipes and Intermediate-Level Waste Bunkers

Standpipes

The standpipes are vertical, in-ground, tubular concrete structures. There are 171 in-ground standpipes located in the southwest section of the WMA providing near surface storage for ILW packages and some quantities of irradiated and unirradiated fuel in 69 of those standpipes. Ninety-five standpipes contained in rows A to C and the west half of row D are buried under up

to 50 centimetres (cm) of soil. The remaining 76 standpipes in the east half of row D and in rows E, F, and G have their tops exposed up to 50 cm above ground.

There are two types of standpipes with the first generation, consisting of two concrete pipes attached to a concrete base and held together by a steel cable and having a poured in-place concrete cap, and a second-generation type consisting of a cast-in-place concrete pipe that is lined with steel and has a removable concrete plug. The first generation of standpipes come in four sizes while the second generation have two sizes. The standpipes no longer receive material for storage. There are three empty standpipes in the standpipe area. The standpipes are not operational, and no waste was added during the licence period.

Intermediate-Level Waste Bunkers

There are seven ILW Bunkers in the south portion of the WMA. A summary is provided in Table 3 along with the status of the bunkers. Some water infilling has been identified through assessment work at some of the bunkers. Water is being closely monitored to ensure the protection of the environment until the waste can be removed.

Table 3: Intermediate-Level Waste Bunker summary.

ILW Bunker	Dimensions (l × w × h in metres)	Volume (m^3)	%Full [a]	Condition Remarks
1	13.0 × 5.6 × 3.3	160	100	Closed. Infilled with water and no sump system.
2	13.0 × 5.6 × 3.3	160	100	Closed. Infilled with water and no sump system.
3	13.0 × 5.6 × 3.3	160	100	Closed. Infilled with water and no sump system.
4	13.0 × 5.6 × 3.3	160	70	In service, no new waste added. Some water inflow, regulated by a sump.
5	13.0 × 5.6 × 3.3	160	100	Closed. Sealed and graded. Some water present due to pipe damage.
6	11.1 × 6.5 × 5.0	219	60	In service. Segregated internally for shielding.
7	12.0 × 6.0 × 3.3	190	86	In service. Segregated internally for large items.

a Percent full represents an estimated value.

Work Completed

Inspections of the bunkers are completed each year. Work to prepare for extraction of waste from the ILW Bunkers and standpipes commenced in 2017 and continued into 2024 with physical preparatory work done and fabrication of the extraction equipment occurring off site. Design documents are being prepared for modifications to the grounds surrounding the ILW Bunkers and standpipes to facilitate waste recovery. No modifications were made in those areas between 2020 and 2023.

Development of manual retrieval equipment is progressing and will be used to remove waste from ILW Bunkers 4, 6, and 7.

Automated equipment has been designed, fabricated, and assembled at an off-site location, to address waste retrieval from both standpipes and bunkers. Standpipe waste retrieval equipment includes a standpipe headworks for removing standpipe plugs, and a standpipe waste retrieval system to recover high radiation field standpipe contents. Bunker waste retrieval system equipment is for the recovery of waste from ILW Bunkers 1 to 3 and 5. It includes a sorting and conditioning unit to sort and characterize recovered waste prior to packaging into containers.

This equipment is currently being assembled for acceptance testing at an off-site location, prior to being transported to WL. For mock testing purposes, an outdoor concrete pad was constructed adjacent to the fabrication facility that emulates the standpipe and bunker storage structures. The mock testing pad with the equipment in various stages of assembly is shown in an aerial photograph in Figure 14.

Figure 14: Aerial photograph showing the off site concrete pad that emulates site conditions with the waste retrieval system constructed on top for testing purposes.

4.1.5.2 Low-Level Waste Bunkers

There are six LLW Bunkers in the WMA. Low-Level Waste Bunkers 1 to 4 are located near the west side of the WMA and LLW Bunkers 5 and 6 are in the northwest section of the WMA. A summary of the status of the bunkers is provided in Table 4.

Table 4: Low-Level Waste Bunker summary.

LLW Bunker	Dimensions (l × w × h in metres)	Volume (m^3)	%Full [a]	Condition Remarks
1	26.4 × 6.6 × 5.2	805	100	Closed. Built in two 13.2 m long sealed sections. Situated at an elevation above the water table.
2			100	
3			100	
4			100	
5			35	Waste removal is ongoing and approximately 65% complete.
6			0	Built as one complete unit. Being repurposed for liquid waste processing/solidification.

a Percent full represents an estimated value.

A fabric structure with a ventilated enclosure was built on the east end of LLW Bunker 5. The structure allows waste to be removed out of the weather, and the ventilated enclosure isolates the waste from the rest of the workspace. The ventilated enclosure is immediately in front of the east wall of the bunker, where an opening has been made to access the waste. A ventilation unit on the west side of the bunker draws air through a HEPA filter to provide a negative pressure workspace in the bunker so that disturbed material is drawn through the filter rather than the workspace. Waste has been partially removed from the bunker, and some has been sent to CRL.

A large fabric structure is under construction connecting the space between LLW Bunkers 1 to 4. Each bunker will have a similar ventilation unit to Bunker 5 installed when the waste is to be removed.

The bunkers are inspected annually, and repairs to the concrete and cementitious coating are made as required to keep the bunkers fit for service.

4.1.5.3 Trenches

Within the WMA, there are 25 filled trenches numbered 1 to 12, 13A, 13B, 14 to 18, 18A, and 19 to 23. The trenches are unlined, and each is approximately 6 m wide by 4 m deep with lengths up to 60 m. These trenches were excavated with a backhoe and wastes were transferred into the trench with a front-end loader. The trenches were then covered with approximately 1.5 m of excavated material after they were filled. Trench 10 was specially constructed for filtration of WR-1 wastewater containing small amounts of organic materials at low specific activity. In preparation for remediation, work around Trench 10 commenced by laying out ground mats and beginning to assemble equipment. Trench 6 contains fuel channels from WR-1 covered by 4 m of fill and clay.

The trenches and the rest of the WMA are monitored by a series of groundwater wells arranged in well nests. The nests typically have four wells with different depths: one collects water from in the clay layer, one in the clay till, one in the basal sand, and one in the underlying rock.

As described in the Comprehensive Study Report [1], Trenches 1, 4, 10, and 16 are planned for complete waste retrieval and trench remediation.

In the 2019 Licence Hearing, a path forward for 21 of 25 LLW trenches had not been confirmed. These trenches are identified for in situ disposal and natural attenuation in the Comprehensive Study Report [1], pending approval of a final safety case. In 2021 January, publication and implementation of REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste* [8], resulted in an internal preliminary review of the publication. During the review CNL's original plan was assessed, and other options were developed for the consideration of all parties involved. Detailed reviews are underway on the three main options below:

1. In situ disposal of the trenches' waste as stated in the 2002 Comprehensive Study Report [1];
2. Removal of the dry active waste with the clay cap and liner materials remaining in situ for natural attenuation: The dry active waste would be sorted and processed (compaction or incineration) and shipped for off-site processing and/or interim storage; and
3. Full removal of all dry active waste and affected clay material (caps and liners): The dry active waste and affected clay material would be sorted and processed (compaction or incineration) and shipped for off-site processing and/or interim storage.

Engagement with First Nations, the MMF and the public began in latter part of 2023 to gather feedback on the three options. The engagements are focused on giving First Nations, the MMF and the public a background of what type of waste is in the trenches and describing options regarding paths forward that are within the current regulatory requirements. Feedback received will help CNL choose a preferred option for the path forward for the trench waste.

Further characterization of the WMA and trenches is planned, and a characterization plan was developed to help guide that effort. Initial characterization work in 2024 will focus on collecting samples adjacent to trenches. A second phase of sampling in 2025 is to focus on samples from inside trenches.

4.1.5.4 Other Waste Management Area Facilities

The WMA contains other structures and areas including:

- Building 423;
- Building 533;
- Storage Quonsets (Buildings 431, 432 and 433);
- Soil Storage Compound;
- Building 923;
- Recoverable Surface Staging and Storage Area; and
- Building 202.

Building 423 was the former operations and entry building. It was renovated to become an entry-exit and radiological monitoring building with emergency showers.

Building 533 is a trailer complex for Nuclear Operations and Security. Project personnel performing decommissioning work at the WMA are also based in the building. The building has showers, change rooms, and a lunchroom for workers.

Building 431, a Storage Quonset, contains historical waste which is in the process of being characterized and packaged. Building 432 and Building 433 also contain various historical wastes and wastes held in various stages of characterization and repacking operations. Most work has been halted since the safety stand-down; the current waste inventory is safe and monitored by operations personnel.

The Soil Storage Compound is a raised landfill-like structure. No waste was stored or received at the compound over the duration of the licence period.

Building 923, the former SMAGS facility, was emptied of waste and is in the process of being converted to the Cask Loading Facility to support packaging and transport of waste from the ILW Bunkers and standpipes. An overhead crane has been installed and internal shielding wall installation was started. These walls are for radiological shielding during holding of waste recovered from bunkers and standpipes prior to off-site shipment. Installation of mounting for electrical gear has begun. The Cask Loading Facility took delivery of the components required to assemble a waste transfer station in 2023. The planned schedule for installation of the concrete pad and subsequent installation of the transfer station components was delayed by the weather and further by the site safety stand-down.

The surface limestone pad to the east of the north access road within the WMA was placed into service as the Recoverable Surface Staging and Storage Area and is used as is an interim storage area for ISO containers which contain waste or waste materials. The ISO containers, or oversized items, in this area are those awaiting processing, characterization, and packaging for off-site shipment. The Recoverable Surface Storage and Staging Area was required to allow Building 923 to be converted to a Cask Loading Facility.

In 2022, the process began to convert LLW Bunker 6 to the Intermediate-Level Liquid Waste Treatment Centre, Building 202. This primarily focused on roof coating and coating of the walls of the future tank area in the west end of the structure. A proposed approach to further reduce the volume of radioactive liquid waste is being reviewed prior to progressing with installation of solidification equipment in the building.

4.1.6 Auxiliary Operational Facilities

The auxiliary operational facilities consist of Buildings 300, 305, and 402. Buildings 305 and 402 have already been decommissioned and demolished. Building 300 is still in operation. All maintenance and non-routine work in the remaining facility (Building 300) that may affect the safe operation of facilities, systems, and laboratories, or that may present a hazard to the public, are conducted in accordance with CNL’s work permit system.

All routine maintenance for systems required to be operational was carried out, and all equipment tests and inspections were completed. No program changes were made for the auxiliary facilities during the current licence period.

In addition, a new building (Building 543) is currently under construction. When completed and operational, the new building will house the whole-body counter and will be added to the list of facilities in this section.

4.1.6.1 Research and Development Facilities Complex (Building 300)

Building 300 was the primary research laboratory for the WL Site, housing a wide range of nuclear research and development programs. The building comprised an area of approximately 17,000 square metres (m^2) and was built in seven stages from 1964 to 1982. The building contained 68 laboratories, as well as numerous offices. The south end high-bay area contained experimental activities that required large areas and significant headroom; RD-14M and RD-17 experimental loops were in the south end high-bay.

WL Site and Nuclear Operations staff and user groups in Building 300 carried out routine operations which included:

- Non-radiological laundry activities;
- Respirator fit test / maintenance activities;
- Sample management office lab;
- Environmental lab;
- Cleanup activities associated with decommissioning;
- Routine building and system maintenance; and
- Surveillance to ensure compliance with the Licence.

4.1.6.2 Health and Safety Facilities (Buildings 402 and 305)

Building 402 had three floors comprising an area of approximately 2,162 m^2, housing WL dosimetry services and Environmental Management laboratories. The CNL facilities in Building 402 included a whole-body counting facility, thermoluminescent dosimeter readers, environmental laboratories, and a cesium-137 (Cs-137) gamma calibrator.

Demolition of Buildings 402 and 305 was carefully executed with the whole-body counter in an annex to building 402 until the whole-body counter structure was moved into its new location, Building 543, in 2022 January. Building 543 is still waiting for services (electrical) to be connected and turned over to Radiation Protection Branch so that the whole-body counter instrumentation can be set up, commissioned, and put back into service (note that internal bioassay was conducted using urinalysis while the whole-body counter has been unavailable). Demolition of Buildings 305 and 402 was completed in 2022 March, reducing the site's liabilities. The building's footprint has had a gravel pad installed and will house trailers for staff offices and washrooms.

4.1.7 Land-Use and End-State

The development of the WLRP LUES Plan continued over the last licence period. The LUES Plan will define the WL post-decommissioning, post-remediation, and post-closure LUES categories and their allocation for the WL lands. The document will discuss and provide reference to the

end-state clearance levels and cleanup criteria for the decommissioning of the nuclear facilities, non-nuclear buildings, utilities, general infrastructure, and impacted lands. This document will meet regulatory requirements including CNSC's REGDOC-2.11.2 *Decommissioning* [9] and the Canadian Standards Association (CSA) N294:19 *Decommissioning of Facilities Containing Nuclear Substances* [10].

At the "Regional Gathering," one of the focus areas was the LUES Plan. The gathering had about 85 attendees with representation from elected individuals from local municipalities, as well as representatives from First Nations and the MMF. Along with the roll-out of the LUES Plan, other items discussed were environmental monitoring, radiation protection, waste management, and economic development ideas. In early 2023 July, the latest draft of the LUES Plan was distributed to communities seeking their review and feedback. As of spring 2024, limited feedback has been received. Canadian Nuclear Laboratories will continue Indigenous and public engagement to gather feedback on the plan.

Another Regional Gathering, with many of the same participants, took place 2024 June 04 to continue with LUES engagement. A total of 94 participants attended the 2024 Regional Gathering. Feedback on the LUES Plan and other WLRP projects was collected, and CNL is now working on bilateral meetings with interested parties.

To help with the public engagement aspect of the LUES Plan, CNL has engaged a third party to help develop and plan various strategies to gather public feedback regarding the WLRP, including the LUES. This multi-phased plan includes phone polling of local communities, directly attending municipal council meetings, meeting with specialized focus groups (e.g., AECL/CNL Alumni), and attending local events to engage the public. Gathered feedback is being used to customize the engagement strategy to be effective in engagement. As a result, CNL has attended several local events such as trade shows and farmers markets.

To engage with Indigenous communities, CNL has added LUES to the agenda of existing bilateral meetings. Canadian Nuclear Laboratories is developing a plan to engage directly with individual First Nations and the MMF that will extend into the next licensing cycle.

Canadian Nuclear Laboratories plans on continuing engagement with First Nations, the MMF and the public to incorporate feedback into the LUES Plan. At the end of the current licence period, the LUES will still be in draft form and meaningful engagements will be continuing.

4.2 Plans for Proposed Three-Year Licence Period (2025 to 2027)

Canadian Nuclear Laboratories plans to continue to decommission the WL Site as described in the *WL Detailed Decommissioning Plan* [DDP]*, Volume 1 - Program Overview* [11]. This section presents summarized information relating to key decommissioning projects planned during the proposed three-year period of the renewed Licence. Subject to CNSC approval through the issuance of the requested Licence, CNL will continue with activities for the WLRP, demonstrating strong, compliant licence performance while continuing with the important site decommissioning and environmental remediation work.

4.2.1 Shielded Facilities

During the upcoming licence period, SF will continue work safely and ensure ALARA principles are applied to ongoing activities. The focus will be on repairing or replacing components credited with performing a safety function that are no longer operable or obsolete and no longer reliable. The SF safety analysis report is being revised and is scheduled for submission to the CNSC in 2026 Q1. Once approved, the SF will be fully operational to support waste packaging operations needed for work such as standpipe retrievals. Hot cells are planned to be operational during the upcoming licence period.

Planned activities include:

- Upgrade/maintain hot cell exhaust fans (VF90/91);
- Repair exhaust fans for IFTF (VF109/110);
- Maintain/replace continuous air monitoring systems;
- Maintain/replace area radiation monitoring systems; and
- Repair roof.

4.2.2 Whiteshell Reactor – 1

Ongoing maintenance and compliance activities will continue over the next licence period. In addition, work continues on an environmental assessment, engagement, and regulatory review that are required for a proposed amendment to the licensing basis. The EIS is being prepared to evaluate the proposed change to the licensing basis. A revised version of the EIS was submitted to the CNSC to address the comments received in 2022 December. Canadian Nuclear Laboratories will submit an updated EIS package in 2024 to address review comments by the Federal/Provincial/Indigenous Review Team. The environmental assessment and licensing review is expected to conclude in the next 2 years. Should CNL proceed with the proposal to amend the licensing basis, a new CNSC hearing would be scheduled.

4.2.3 Concrete Canister Storage Facility

Planned activities at the CCSF will be focused on retrieval of the irradiated natural uranium oxide fuel baskets. Safety analysis for retrieval of the mixed fuel types will be undertaken during the upcoming licence period. In addition, mock trials using the on-site demonstration canisters will occur late during the current licence period.

Plans also include installation of IAEA monitoring equipment. This equipment is required for undertaking any activities involving handling of irradiated fuel baskets. Recovered fuel baskets will be transferred to the receiving facility at CRL for storage until a disposal site is available.

4.2.4 Waste Management Areas

In addition to the activities in Sections 4.2.4.1 to 4.2.4.4, planned activities in the WMA will also focus on manual retrieval of waste from standpipes and bunkers and recovery of waste from Quonsets and LLW Bunkers.

Completion of the WMA power upgrades will be done to connect a new power line from the WL substation to a series of transformers and generators to the west of the WMA. These transformer and generators will provide power and emergency back-up power for the Cask Loading Facility and associated liquid waste treatment (Building 202).

A soil management area pad will be installed to the northwest of the WMA. This will allow collection and radiological/chemical clearance of clearable soil recovered from the WL Site and the WMA. Soil cleared at this location will be available for backfill on site. An additional road will be installed west of the CCSF and WMA to access this location. Drainage from the pad will be directed to WMA compliance ditches to allow sampling of any runoff.

Additional trailers will be placed on the nearby Building 503 building pad to provide space for workers performing decommissioning work.

4.2.4.1 Standpipes and Intermediate-Level Waste Bunkers

Construction of ground works to support Standpipe and Bunker Waste Retrieval System equipment will be done including relocation of south road, leveling of the standpipe area, and installation of travel and operating pads for the Standpipe and Bunker Waste Retrieval System. The Standpipe and Bunker Waste Retrieval System will be delivered and assembled with pre-operational testing done. Operation of the equipment also requires completion of the Cask Loading Facility and Intermediate-Level Liquid Waste Processing Centre construction and commissioning, along with review and approval of associated documentation by the CNSC.

The 21 standpipes with low radiation fields will be put back into operational status in the next licence period to allow manual retrieval. The recovered waste will be characterized, sorted, segregated, and repackaged for off-site shipment. In some cases, wastes will be characterized and processed in a ventilated enclosure in the WMA or the HCF.

4.2.4.2 Low-Level Waste Bunkers

Construction of a ventilated enclosure around the LLW Bunkers 1 through 4 will be commissioned for use. Access to the waste contents within the bunkers will be made by creating openings in the bunker walls. This will allow safe retrieval of the LLW contained within the bunkers.

4.2.4.3 Trenches

The public and Indigenous engagement activities related to the trenches options for the 21 trenches began in 2023, as discussed in Section 4.1.5.3, engagement will continue into 2024 until a preferred decommissioning option is selected. It is anticipated that in the summer of 2024, CNL will conduct the first phase of the WMA characterization. This characterization will not be intrusive to the trench waste but will gather data on groundwater dynamics.

In 2025, the second phase of the WMA characterization will be conducted. The intent of this phase of characterization will be to gather data related to amounts of contamination in the clay caps and soil lining the trenches. This data will support the basis of the preferred

decommissioning option and help identify any steps to be taken to attain any required regulatory approval.

Once a preferred decommissioning option is selected, there will be a need to update documents such as a DDP, safety case, and work plan. The preferred option will be executed based on timing and availability of the selected off-site waste-receiving facility.

4.2.4.4 Other Waste Management Area Facilities

Other WMA facilities are described under their respective sub-heading below.

Storage Quonsets

Planned work includes characterization and packaging of waste currently in the Quonsets. Two of the Quonsets have large doors that can be difficult to open depending on normal ground movement from freeze–thaw activity. These doors will be modified or replaced to enable the waste handling work to proceed.

Soil Storage Compound

During the upcoming licence period, there is no planned work for the Soil Storage Compound; previously, it was used to store packaged contaminated soil. The original inventory was transferred to the CRL Site. The adjacent “suspect clean” soil pile was generated during construction of the Soil Storage Compound. In the future, the compound will be converted to a non-operational area. The DDP covers this facility, and a work package for decommissioning and demolition is in place.

Cask Loading Facility

Planned work in the Cask Loading Facility includes several tasks including completion of electrical systems installation, installation of the transfer station that will allow assay and transfer of waste into shipping casks for off-site shipment, lowering of the duct work to permit installation of the new fire detection system, completion of the shielding walls, and commissioning of systems and training of personnel to operate the facility.

Recoverable Surface Storage and Staging Area

Planned work for the Recoverable Surface Storage and Staging Area includes shipping of the current inventory of materials. In addition, work will continue to support decommissioning of the WMA structures by reducing hazards to safely package and ship waste to appropriate receiving facilities.

Intermediate-Level Liquid Waste Treatment Centre, Building 202

Planned work for the Intermediate-Level Liquid Waste Treatment Centre includes an assessment of the current process with the intention of reducing the volume of radioactive liquid waste to be solidified. Pending the outcome of the assessment, work will proceed to install, commission, and put into operation equipment to pre-treat, treat, and/or condition the radioactive liquid waste.

4.2.5 Auxiliary Operational Facilities

Considering that Buildings 305 and 402 have already been decommissioned and demolished, there is no immediate plans for the next licence period, although trailers will be installed on the footprint where these buildings existed. Building 300 is still in operation. When completed and operational, Building 543 will be added to the list of auxiliary operational facilities.

4.2.5.1 Research and Development Facilities Complex – Building 300

Building 300 remains in operation and houses offices, as well as laboratories for Environmental Management and the Sample Management Office. Canadian Nuclear Laboratories will continue to maintain the structure for its current purpose. Non-routine work in this facility that may affect the safe operation, systems, and laboratories, or that may present a hazard to the public, will be conducted in accordance with CNL's work permit system.

4.2.6 Land-Use and End-State

Canadian Nuclear Laboratories will continue to execute the engagement plan for the end state of the site following completion of the decommissioning and environmental remediation. Engagement feedback will be considered and integrated into the end state documentation which will be submitted to the CNSC for acceptance. The plan will continue to be a living document and be updated if needed based on continued engagement and feedback.

Canadian Nuclear Laboratories envisions ongoing and positive engagement with the public and Indigenous communities. Canadian Nuclear Laboratories will continue to implement and improve the strategy to acquire meaningful feedback and incorporate the information into the LUES Plan.

5. Safety and Control Areas

The *Licence Conditions Handbook for Whiteshell Laboratories Nuclear Research and Test Establishment Decommissioning Licences* (LCH) [12] and NRTEDL-W5-8.00/2024 [2] identify 14 SCAs that are applicable to the WL Site. Each SCA is described below along with a synopsis of Changed to acceptance progress over the licence period and predictions for the requested licence renewal period.

5.1 Management System

This section describes CNL's robust management system, which is aligned to focus on safety and support the safe conduct of licensed activities. Canadian Nuclear Laboratories' management system follows the *Class I Nuclear Facilities Regulations* [13] and the *General Nuclear Safety and Control Regulations* [14] pursuant to the *Nuclear Safety Control Act* (NSCA) [15]. Canadian Nuclear Laboratories is also compliant with CSA N286:12 (R2020) *Management system Requirements for Nuclear Facilities* [16], CSA N286.6 *Decommissioning Quality Assurance for Nuclear Power Plants* [17], CNSC REGDOC-2.1.2 *Safety Culture* [18] and have developed several CNL management system documents surrounding quality, functional authority, licences, certificates, permits, along with codes, standards, and site-specific plans.

5.1.1 Management System Program

Canadian Nuclear Laboratories is governed and managed through an integrated set of documented policies, expectations, standards, procedures, and responsibilities. Canadian Nuclear Laboratories' integrated management system demonstrates and documents the commitment to maintaining high quality and excellence in the management of all CNL activities in an environment that prioritizes safety and fosters continuous improvement.

The CNL management system provides the framework of processes, procedures, and practices used to ensure that CNL can fulfill all tasks required to achieve our objectives safely and consistently. This foundational framework delivers quality research and development; design engineering; procurement; manufacturing; qualification testing; construction; commissioning; operations; decommissioning; demolition; waste management; inspection; maintenance; and plant life management and project management for nuclear power plants, research reactors, and nuclear or non-nuclear facilities and installations.

The management system provides, enables, and defines a detailed framework for full nuclear facility life cycle phases, including construction, commissioning, operations, decommissioning, and long-term safety of the nuclear facilities and laboratories at all CNL sites. The existing programs and processes will continue to evolve as required to meet changes to regulatory requirements.

Effective corporate governance of CNL's management system is achieved through the establishment and implementation of controls that are defined within the CNL Management System Manual. A functional authority structure is applied to all CNL management system components, with assigned responsible executives and functional support manager roles to ensure CNL functions meet external requirements; protect workers, the public, and the environment; and adequately address other vulnerabilities (e.g., financial, legal, or security).

Canadian Nuclear Laboratories uses a suite of management system documents that encompass the top tier of the CNL management system; a program description and corresponding program requirements documents are supplemented by those that control site licences, certificates, permits, building/facility contacts and licence representatives, and codes, regulations, and standards.

5.1.1.1 Problem Identification and Resolution Program

The CNL Problem Identification and Resolution Program supports the management system by coordinating the management of incidents, events, opportunities for improvements, and corrective actions.

The Problem Identification and Resolution Program applies to all CNL sites and all its employees and contractors; the program is described as a process for:

- Identifying, prioritizing, investigating, documenting, trending, tracking, preventing, and resolving problems;
- Capturing opportunities for improvement and actions from Operating Experience; and

- Documenting non-conformities and verifying their disposition.

The DevonWay software application contains the data and tracking functionality to allow CNL to monitor the health of the Problem Identification and Resolution Program and other associated processes. The metrics are defined and communicated using the ImpAct Process Health Report and the Contractor Assurance System corporate scorecard.

In collaboration with the Problem Identification and Resolution Program, human performance events are identified and trended in the Contractor Assurance System scorecard. The Problem Identification and Resolution Program process supports timely identification, corrective action development, and resolution of these events.

The Problem Identification and Resolution Program is used to identify, track, and trend human performance–related events as a primary metric of the company scorecard. These results are communicated through all levels of the organization. These indicators reflect the effectiveness of management in improving organizational processes.

The operating experience and lessons learned process promotes the identification and dissemination of operating experience and lessons to be learned from internal and external industry events to improve safety, reliability, and business processes, while reducing the time at risk and improving the overall performance of CNL. This includes the process for receiving, processing, screening, reviewing, evaluating, and sharing internal and external operating experience across the CNL organization, as well as to the nuclear industry, while endorsing a learning organization culture.

5.1.1.2 Quality Assurance Program

Canadian Nuclear Laboratories' Quality Assurance Program is based on and meets the requirements of CSA N286.12 (R2022) *Management System Requirements for Nuclear Facilities* [16], CSA N286.6, *Decommissioning Quality Assurance for Nuclear Power Plants* [17], and ISO 9001:2015, *Quality Management Systems – Requirements* [19]. A site-specific WL decommissioning quality assurance plan provides a detailed approach to quality assurance for WL.

The CNL Quality Assurance Program document serves the following purposes:

- Explains the CNL Quality Assurance Program and identifies CNL's top level required methods for operating within the quality assurance requirements;
- Establishes quality assurance requirements for conducting activities or services that affect, or may affect, nuclear safety of facilities in a graded manner to ensure that environmental, safety, and health risks or impacts are minimized; and
- Ensures that safety, reliability, products, and performance are maximized by using effective management systems. The CNL graded approach is based on the importance of safety and the safety significance of structures, systems, and components and on a specific evaluation of regulations, risks, complexity, and history of previous implementation. All requirements apply to varying degrees, depending upon the safety significance and complexity of the work being performed.

Quality requirements are addressed for all CNL facilities, locations, and activities in the overall management system using a graded and integrated approach, along with health, safety, security, and environment; statutory; and regulatory requirements. All work is executed in accordance with controlled procedures to achieve a desired performance that includes both full compliance with the applicable customer requirements along with the efficient and effective delivery of results.

5.1.1.3 Information Management

The Information Management Program implements and monitors controls that apply to all information assets, including structured, unstructured, or transitory, and extends to all activities throughout CNL. Information management follows the requirements of all relevant certifications, as well as other standards that have been adopted by CNL as best practices. All CNL employees are responsible for abiding by the controls that information management processes define, especially relating to the information in their direct care.

The mandate of the Information Management Program is as follows:

- Govern the creation, classification, capture, use, dissemination, retention, preservation, and disposition processes of information throughout the enterprise;
- Preserve company records that are centrally archived;
- Uphold the integrity of the management system document framework;
- Uphold the quality of document capture into the Electronic Document and Records Management System; and
- Provide personnel with information resources on site and access to worldwide resources through online subscriptions and inter-library loans.

Information management facilitates compliance with all applicable requirements to retain and manage information, to deliver targeted services and solutions to the business groups, and to ensure that records remain available and usable until they are no longer required to meet operational or regulatory obligations. The Information Management Program is responsible for setting the strategies to manage information and the governance framework and procedures that guide employees from the creation to the disposition of information assets. Information management establishes standards and procedures to facilitate the following:

- The ownership and stewardship of information assets;
- The creation, capture, and use of information;
- The storage and protection of records to guarantee their accessibility and usability for the length of time required; and
- The disposition of records with due diligence when their retention expires.

Storing and handling information is a controlled activity at CNL. The Information Management Program develops and maintains processes to ensure the authenticity and integrity of records so that CNL can meet its long-term information requirements.

Documents related to the WLRP are controlled to ensure they are prepared and accepted by qualified staff, reviewed for adequacy, approved for use, and distributed to the required personnel, as required by the Information Management Program. Essential and non-essential records are identified, controlled, filed, and maintained in accordance with company-wide procedures including project documentation, operating and maintenance procedures, waste data records, regulatory correspondence, and non-conformance reports.

Information management applies during all phases of the WLRP, and the appropriate records will be retained as a permanent record to be used by future generations. For example, CNL has recently transitioned to a modern electronic waste tracking system to ensure reliability and efficiency of waste tracking while safeguarding the information in a secure, retrievable, and traceable manner to meet business and regulatory requirements. The new system has the capability to capture, store, and retrieve information related to waste data including a transactional history from generation through processing to storage and/or disposal.

5.1.2 Past Performance

The CNL management system implements the requirements in REGDOC-2.1.2, *Safety Culture* [18] and CSA N286.12 (R2022) *Management System Requirements for Nuclear Facilities* [16] and ensures compliance with these regulatory requirements at CNL.

Canadian Nuclear Laboratories continually assesses the management system performance through the following mechanisms:

- Safety and security culture assessments and the annual monitoring of CNL, as well as individual sites such as WL, against the maturity model indicators;
- Nuclear Performance Assurance Review Board, which reviews the performance of CNL's nuclear facilities and SCAs quarterly;
- Corrective Action Review Board, which reviews the status of the Problem Identification and Resolution Program, its outcomes, and the results of nuclear oversight audits;
- Contractor Assurance System, which is used to integrate various performance measures and indicators to provide an evaluation of CNL performance; and
- Facility authorities / Chief Nuclear Officer monthly meeting reviews of nuclear facilities safety performance.

The CNL management system is relevant to all phases of the WLRP Licence requirements to ensure safe, effective, and efficient conduct of design, construction, commissioning, operations, and decommissioning of the nuclear facilities and delivering against commitments within appropriate accountabilities and controls.

Internal quality audits of the WL Environmental Protection Program were conducted in 2020, 2022, and 2023. Quality audits in 2023 also included WL Pressure Boundary and Supply Chain programs. In addition, several self-assessments were conducted in 2020, 2021, and 2022 that spanned several SCAs. In 2023, additional self-assessments were conducted that considered aspects of all SCAs. Management reviews of the management system are conducted annually.

An external audit of the Fire Protection Program was conducted in 2021. A corrective action plan was developed to address instances of non-compliance and submitted to the CNSC in 2022. In addition, annual external audits are conducted on the WL Environmental Management System ISO 14001:2015 (2019, 2020, 2021, and 2022). All actions resulting from audits, inspections, reviews, and self-assessments are managed and tracked through CNL's Problem Identification and Resolution Program. During the licence period, CNSC conducted several inspections as summarized in Table 5.

Table 5: Canadian Nuclear Safety Commission inspection conducted at Whiteshell Laboratories.

Inspection No. [a]	Area Inspected	No. of NNCs	No. of NNCs Closed/Requested Closed
No inspections were performed in 2020			
CNL-WL-2021-01	Human Performance Management	2	2
CNL-WL-2021-02	Management System	6	6
CNL-WL-2021-03	General	3	3
CNL-WL-NSD-T2-2021-001	Security	7	7
CNL-WL-2022-01	Radiation Protection	0	N/A
CNL-WL-NSD-T2-2022-001	Security	0	N/A
CNL-WL-2022-03	Waste Management Area	5	4
CNL-WL-2023-01	Environmental Protection	2	1
CNL-WL-NSD-T2-2023-001	Security	1	1
CNL-WL-2023-02	Emergency Response and Fire Protection Equipment	10	10
CNL-WL-2023-03	Emergency Response and Fire Protection Fire Drill Evaluation	8	8
CNL-WL-2023-04	Human Performance Management – Personnel Training	4	0
CNL-WL-2024-01 and **CNL-WL-2024-02**	Problem Identification and Corrective Action Program, General	3	0
CNL-WL-2024-03	General		Inspection report forthcoming

Inspection No. [a]	Area Inspected	No. of NNCs	No. of NNCs Closed/Requested Closed
CNL-WL-2024-04	Emergency Management and Fire Protection		Inspection report forthcoming
CNL-WL-2024-05	General		Inspection report forthcoming
CNL-WL-NSD-T2-2024-001	Security		Inspection report forthcoming

a As of 2024 June.

NNC = Notice of Non-compliance. N/A = Not applicable.

The International Atomic Energy Agency (IAEA) conducted design information verification (DIV) inspections and physical inventory verification (PIV) inspections, and requested complementary access (CA) to the WL Site during the licence period. Design information verification inspections verify the information provided by CNL in the design information questionnaire (DIQ). In 2019, the IAEA requested that the DIQ be updated to reflect the changes to the WMA fence line and new buildings. Inspections in subsequent years confirmed the accuracy of the DIQ. As a result of a 2022 PIV inspection related to testing of fissionable materials, two actions were raised by CNL to address IAEA observations and were promptly completed. The CA request in 2022 was related to inspection for undeclared nuclear materials and to confirm decommissioning of a structure. A summary of IAEA inspections is presented in Table 6.

Table 6: International Atomic Energy Agency inspections conducted at Whiteshell Laboratories.

Whiteshell Laboratories	Activity						Total
	PIV	DIV	RII	IIV	UI	CA	
2020	1	1	0	0	0	0	**2**
2021	1	1	0	0	0	0	**2**
2022	1	1	0	0	0	1	**3**
2023	1	1	0	0	0	0	**2**
2024 [a]	1	1	0	0	0	0	**2**
Total	5	5	0	0	0	1	**11**

a As of 2024 May.

IIV = interim inventory verification; UI = unannounced inspection.

Transport Canada conducted inspections of WL's Transport of Dangerous Goods Program in 2021. No non-conformances were raised in 2021. In 2023, 16 Assurances of Voluntary Compliance or directions were issued by Employment and Social Development Canada, with five still in progress.

Should events occur at WL, they are recorded in the Improvement Action (ImpAct) system. This information is regularly reviewed to identify any trends. Formal event-based trend reports continue to be prepared monthly to predict any adverse trends and identify improvements. No event trends were identified in 2023.

The use of the Problem Identification and Resolution Program continues to foster the internal reporting of lower significance level events (Level 4 and some Level 3), thus affording the opportunity to implement continuous improvement initiatives through robust Problem Identification and Resolution processes. A summary of ImpActs raised over the licence period is presented by significance level in Table 7.

The reporting of lower significance level events continues to be encouraged to improve safety culture.

Operating experience bulletins, from across different business lines, were requested by responsible managers, management review meetings, and senior leadership to be shared company-wide, demonstrating a continuous organizational willingness, at multiple leadership levels, to share events and learn from each other.

Table 7: Number of ImpActs raised at Whiteshell Laboratories during the licence period.

Year	Level 0	Level 1	Level 2	Level 3	Level 4	Total
2020	13	0	3	58	276	350
2021	5	0	2	81	336	424
2022	2	1	4	61	306	374
2023	8	1	6	90	312	417
2024 [a]	2	0	1	21	150	174

a 2024 total current to 2024 May.

The CNL management system is built on years of experience at multiple sites, conducting work through the full nuclear facility life cycle phases, including the long-term safety of the nuclear facilities. During 2022 and 2023, two Level 1 ImpActs were raised in association with deficiencies in lock-out tag-out procedures (see Section 5.2); and issues were identified during a self-assessment of the Fire Protection Program (see Section 5.10).

5.1.3 Future Plans

The CNL management system enables continued safe operational practices at CNL throughout the next licence period. Canadian Nuclear Laboratories will continue to apply the management system, adapting as required to changing conditions and regulatory requirements.

5.2 Human Performance Management

The Human Performance Program consists of two parts, the Human Performance Program and a Training and Development Program. The Human Performance Program manages the outcome of human behaviours, functions, and actions in each environment. The Training Program

requires all functional support areas, line management, and employees to complete general company-wide and position-specific required training and implement specific documented programs and processes in their respective areas. To achieve this goal, CNL provides tools, methods, training, and expertise. Human development and training programs interface with other CNL programs to ensure training requirements are implemented in accordance with the Licence. The programs are designed to manage risks related to variability in individual performance. Efficient program delivery is achieved by maintaining an elevated level of line engagement across program services.

The CNL Human Performance Management Program and Training Program follow the Class I Nuclear Facilities Regulations and the General Nuclear Safety and Control Regulations pursuant to the NSCA [15].

5.2.1 Human Performance Program

Canadian Nuclear Laboratories maintains compliance with the Performance Assurance Program by implementing REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue* [20], REGDOC-2.2.4, *Fitness for Duty, Volume II: Managing Alcohol and Drug Use* [21], and REGDOC-2.2.4, *Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness* [22].

The Human Performance Program is managed by the Operational Excellence department within the Central Technical Authority organization at CNL. Performance assurance requires all functional support areas, line management, and employees to report distinct types of events and implement specific documented programs and processes in their respective areas. To achieve this goal, the performance assurance function provides tools, methods, training, and expertise. The program also interfaces with other programs with respect to risk management related to variability in human performance and maintains a high level of line engagement to provide efficient delivery of program services.

The main objectives of the program are to:

- Strengthen the safety culture at CNL;
- Evaluate human performance effectiveness in the work environment;
- Reinforce the use of human performance methodology through training, communication, and observations;
- Assist leaders in promoting and modelling safe work practices and behaviours;
- Assist employees to recognize and avoid error-likely situations;
- Evaluate error-likely situations, assess defences based on evaluations, and ensure defence in depth; and
- Reduce the error rates using human performance tools.

5.2.1.1 Past Performance

The WL Human Performance Program continued to participate with CNL's overall Safety Excellence initiative through various means, including the stop/pause process and awarding the Safety Excellence trophy (Figure 15).

The goal of the stop/pause process is to capture the conditions that could lead to a failure and impede work projects and deadlines. The process also promotes autonomy and empowers everyone to stop, without fear of retribution, when unwanted, unexpected, and unsafe conditions are observed. It is a proactive approach to safety and preventing accidents. The Safety Excellence team has created resources (e.g., presentations, articles, and current statistics) to help establish a healthy stop and pause culture.

Figure 15: The Bison Trophy, awarded for Safety Excellence.

During the current licence period, WL experienced three safety stand-downs associated with the stop/pause process.

Stand-downs from 2020 and 2022 are related to the Human Performance Program; the more recent stand-down is related to the Emergency Management and Fire Protection SCA (Section 5.10). All three are listed here for completeness:

- On 2020 November 16, CNL initiated a 10-week fieldwork pause in response to an adverse trend in human performance during fieldwork activities and heightened COVID-19 risk;
- On 2022 May 27, WL experienced an event where a worker, while performing maintenance activities on a pump, received an electrical shock. As a result of this incident, WL senior leadership immediately initiated a safety stand-down of all hazardous energy control work. Initial evaluation by a CNL investigative team revealed the event was due to non-adherence to the company-wide hazardous energy control procedure, resulting from human performance errors that identified a lack of thorough hazard identification and mitigation with an overall weakness in the release of work and maintenance supervision. On 2022 June 13, a site-wide safety pause of all fieldwork was declared. The full return to fieldwork occurred on 2022 December 09; and
- On 2023 April 28, following an assessment of the fire system by the Director, Corporate Fire and Emergency Management, the WL Site was placed into a safety stand-down state with only essential compliance and maintenance work being undertaken. Section 5.10.3 discusses this safety stand-down in detail.

The 2020 fieldwork pause resulted in the execution of an extensive corrective action plan, including comprehensive reviews and updates to procedures and a significant investment in employee training. Improvements included increased supervisor presence in the field, in-depth review of proper use of tools and equipment, procedure awareness and compliance, sharing of lessons learned, and better pre- and post-job briefs.

Another outcome of the 2020 fieldwork pause was the development and delivery of general employee training. Training and Development Program staff reviewed the WL Site, provided project updates, as well as a review of policies and procedures. General training was delivered to all WL employees.

In 2021 CNSC conducted a remote inspection focused on the Human Performance SCA (see Table 5). Two non-compliances were addressed by ensuring that CNL's procedures align with the criteria used to assess employee work schedules for safety-sensitive positions at WL. Actions also included ensuring that safety-sensitive positions at WL work within the limits on hours of work and recovery periods per Sections 4.2 and 4.3 of REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue* [20].

As a result of the 2022 stand-down where a worker received a mild electric shock, immediate corrective and compensatory actions included a re-evaluation and re-training of the "Core 5" (i.e., work permit authorization, job safety analysis, pre-job brief, stop/pause work, and integrated work controls), as well as other key training procedures, such as lock-out tag-out. Whiteshell Laboratories enlisted the support of the CNL Strike Team, composed of experts from across CNL, to investigate the lock-out tag-out event that resulted in the safety stand-down at the WL Site. An outcome of the investigations was improvements made to the tracking of training. Whiteshell Laboratories senior leadership developed a comprehensive plan for the safe restart of on-site activities. Phases of the plan were focused on communication,

management oversight, work activity reviews, training, extent of condition, restart authorization, and a phased approach to the full return to fieldwork.

An assessment of the Management Observation Program during 2023 identified an increase in field observations and leaders who understand the program's objectives. These leaders are in the field and provide excellent content that is documented. The success of this group is being used to provide peer mentoring to encourage good reporting practices.

In 2023, field data from the stop/pause initiative indicated that the top three conditions for stopping work are:

1) Unexpected results or unfamiliar situations encountered;
2) Conditions inconsistent with procedures; and
3) Conditions experienced different than expected from the pre-job brief and/or work control processes.

This trending information helps to identify areas for improvement and highlights potential schedule impairments that could interfere with milestones and deadlines. In addition, the effectiveness of WL Human Performance Program implementation has been enhanced through delivering in-person on-site training on the topic of human performance for leaders. The training course Fundamentals of Human Performance was revised to improve the occupational safety content and to clarify the usage of the observation and coaching platform.

5.2.1.2 Future Plans

In addition to maintaining annual plans that include training for all employees, promotion of worker tools, and supporting improvements in field, WL will be implementing actions identified in the gap analysis for the new REGDOC-2.2.1, Human Performance, Version 2 (cnsc-ccsn.gc.ca) [23].

5.2.2 Training and Development Program

The Training and Development Program ensures that employees are adequately and efficiently trained to perform their roles and responsibilities safely and competently. The CNL Training and Development organization maintains the program's governing documents, oversees the implementation of a systematic approach to training, and ensures Licence conditions and legislative/regulatory requirements are met.

The Systematic Approach to Training processes are applied to the development of training plans for positions that perform licensed activities. The CNL Systematic Approach to Training is based on fundamental processes and sound practices that systematically assess the need for training, type of training, and the training content, as well as providing standards for the development, implementation, and evaluation of training. A graded approach, commensurate with risk, is used in the application of the Systematic Approach to Training. A graded approach supports decisions related to the specific processes used and the rigour and level of detail required in the supporting Training and Development Program documents.

The CNL Training and Development Program implements the requirements in *REGDOC-2.2.2, Personnel Training,* Version 2 [24] and other CNL licensing basis documents and ensures compliance with these regulatory requirements at CNL. The main objectives of the Training and Development Program are as follows:

- Strengthen the safety culture at CNL;
- Ensure human performance effectiveness through highly trained, competent employees;
- Maintain the company-wide training standards required to ensure a rigorous and compliant Training and Development Program;
- Provide training oversight, guidance, and resources to support all CNL missions;
- Provide oversight;
- Evaluate all training plans to ensure quality and compliance with requirements; and
- Maintain a Learning Management System that ensures employee qualifications are recorded and accessible to CNL management.

The CNL Training and Development Program has assigned dedicated resources to support the implementation and maintenance of WL training plans. Canadian Nuclear Laboratories has and will ensure that WL worker training requirements are identified, conducted, and documented. This includes ensuring that WL training plans are structured within CNL's Learning Management System, enabling more efficient training reports and increased rigour in tracking worker training compliance.

Whiteshell Laboratories hires external contractors to carry out field work, and all contracts stipulate the prerequisite qualification requirements for contract staff performing work at CNL. Contract companies are responsible for ensuring that these prerequisites are met for their own staff before sending workers to CNL sites. In addition to these prerequisites, contractors working at CNL sites are required to complete CNL-specific training including general safety orientation, facility-specific training, and radiation protection training.

5.2.2.1 Past Performance

In 2020, Training and Development defined a list of CNL positions at WL and roles that require compliant training plans. The requirements of the Systematic Approach to Training align with CNL licence requirements and REGDOC-2.2.2, *Personnel Training*, Version 2 [24].

In 2022, Training and Development implemented a new CNL Learning and Development standard to the management system governing documents. This document will be used to develop training programs for positions not listed in Application of the Systematic Approach to Training. The standard enables a flexible approach to the identification, development, implementation, and maintenance of training plans. This flexible approach will be used to train workers in positions and roles at CNL that are not included on the list. The CNL Learning and Development standard aligns with the requirements of REGDOC-2.2.2, *Personnel Training,* Version 2 [24].

The Learning Management System at CNL was updated in 2022. New software enables more efficient and effective management of training records, including immediate access to worker training records for managers and supervisors.

In 2023 December, CNSC conducted a Focused Type II Personnel Training inspection at WL. As a result of this inspection, CNSC issued four notices of non-compliance and one recommendation. Canadian Nuclear Laboratories developed a corrective action plan to address these non-compliances and is working with the CNSC to resolve the notices of non-compliance.

Whiteshell Laboratories continues to use trainee feedback forms to capture learner input as part of Training and Development Program improvement and maintenance activities. To increase the number of evaluations performed by Training and Development Program owners and managers with Systematic Approach to Training positions and roles, an evaluation plan template was developed in late 2023. This tool aids in planning when evaluations will be completed and helps to ensure that all courses/instructors within a function are evaluated. The documentation of additional evaluations in 2024 will quantify the efficacy of the tool.

In early 2024, a company-wide event was reported to the CNSC indicating that radiation protection (RP) training refreshers had not been completed as required. This event is being investigated to determine the full extent of condition related to types of refresher training. However, WL has confirmed that RP training refreshers for its staff have been completed as required.

Whiteshell Laboratories currently maintains a sufficient number of qualified workers to carry out the licensed activities safely and in accordance with the NSCA [15] and its regulations. All WL personnel, both employees and contractors, are adequately trained (including refresher training) to help ensure safe operation of their facilities and to conduct compliant work under the Licence.

5.2.2.2 Future Plans

During the next licence period, the Training and Development Program will continue to provide centralized leadership and management of training functions at CNL and will remain responsible for the assessment, development, implementation, and monitoring effectiveness of training programs and authorization activities throughout CNL.

Canadian Nuclear Laboratories' Training and Development staff administer the CNL Systematic Approach to Training documentation, the CNL required training, and the Learning Management System, and will continue to maintain this accountability.

5.3 Operating Performance

Whiteshell Laboratories decommissions and operates its facilities safely, according to operating limits and conditions, facility authorizations, laboratory protocols, prescribed programs, and procedures. Operating performance is monitored through the Nuclear Performance Assurance Review Board and other internal assessment activities such as self-assessments and audits.

5.3.1 Conduct of Operations

Conduct of operations documents ensure appropriate integration and adequate reflection of safe operating practices to meet business requirements. Inputs to the CNL Conduct of Operations Program include:

- Site and facility licensing (acts, regulations, licences, handbooks);
- Industry standards;
- Compliance programs;
- Policies; and
- Commitments.

5.3.2 Past Performance

The performance over the current licence period is described in Sections 5.3.2.1 and 5.3.2.2 for WL facilities operations (Licence Condition 3.1, LCH [12]) and for reporting requirements (Licence Condition 3.2, LCH [12]).

5.3.2.1 Facilities Operations

The nuclear facilities located at WL continue to operate safely according to operating limits and conditions. Any non-compliances that were identified during the operation of the facilities and laboratories were reported to CNSC staff, as required, and were addressed. Operational details on facilities can be found in Section 4.1. All temporary and permanent modifications to facilities at CNL are made following defined Engineering Change Control processes.

In accordance with the specific requirements of the current WL LCH, Section 3.1 [12], a revised *Storage with Surveillance Plan for WL Building 100 – WR 1* document [7] was submitted and accepted by the CNSC. This document cancelled and superseded RC-1291-R1, *The Monitoring and Surveillance Plan for the WR-1 Deferment Period* [25].

5.3.2.2 Reporting

Events at the WL Site are reported to the CNSC as required by the NSCA [15], the regulations, and/or the WL Licence [2] and LCH [12].

Table 8 provides a summary of reportable events categorized by nuclear facility and SCA during the current licence period.

Table 8: Total number of reportable events categorized by nuclear facility and program.

Year	Nuclear Facility	SCA/Program	Total
2020	2	2	4
2021	5	1	6
2022	2	1	3
2023	0	15	15
2024 [a]	0	3	3

a As of 2024 May.

For each calendar period of the current Licence, annual compliance monitoring reports have been provided to CNSC staff in accordance with the specific requirements of the current WL LCH, Section 3.2 [12]. The Annual Compliance Monitoring Report for WL for a given calendar year is submitted to CNSC staff by April 30 of the following year, and the Environmental Monitoring Report and the Environmental Assessment Follow-Up Program (EAFP) Report for each calendar year are submitted to CNSC staff by June 30 of the following year.

5.3.3 Future Plans

Canadian Nuclear Laboratories will continue to provide notification to the CNSC as required, based on Licence conditions outlined in the LCH [12]. Canadian Nuclear Laboratories will continue to provide monthly, quarterly, and annual reporting, as well as reports on project progress, completion, and significant milestones identified in the LCH [12].

5.4 Safety Analysis

The Safety Analysis Program develops and controls the suite of nuclear safety analysis documents required to support the licensing basis of all nuclear facilities at CNL, including WL. This program applies to all safety analysis activities involving CNL structures, systems, and components and all management, supervision, and staff.

5.4.1 Safety Analysis Program

Safety analysis reports are produced to demonstrate that the nuclear facilities are appropriately designed to meet health, safety, security, environmental, and regulatory requirements and are operated safely. These safety analysis reports form part of the basis for a set of limiting conditions for safe operation that are documented within Facility Authorizations for each nuclear facility. Three WL facilities have safety analysis reports and Facility Authorizations:

- SF;
- WMA; and
- CCSF.

5.4.1.1 Past Performance

Two Nuclear Safety Notes were placed into use following CNSC staff acceptance. They were for the operation of the Recoverable Surface Storage and Staging Area in the WMA and retrieval of the natural uranium fuel baskets from the CCSF (fuel baskets that were originally transferred to WL from the Douglas Point Nuclear Generating Station). Another Nuclear Safety Note for Phase 1 of retrievals from the standpipes was submitted to CNSC staff and comments provided to CNL; comment disposition has been accepted and has been incorporated into a revision of the Nuclear Safety Note.

5.4.1.2 Future Plans

During the upcoming licence period, there will be revisions to several governing documents for facilities. This includes the safety analysis reports for the CCSF, SF, and WMA. There will also be review and revision to the Facility Authorizations to the above facilities to reflect safety analysis report revisions.

During the next licence period, safety analysis for operation of the Standpipe and Bunker Waste Recovery System, Cask Loading Facility, and the Intermediate-Level Liquid Waste Processing Centre will be conducted and appropriate submissions to the CNSC prepared.

5.4.2 Nuclear Criticality Safety Program

The CNL Nuclear Criticality Safety (NCS) Program provides oversight and direction to all activities that involve fissionable materials. Nuclear criticality safety documentation ensures criticality safety with activities being performed and materials being handled or stored in accordance with limits and restrictions outlined in the relevant criticality safety document. Criticality safety documents continue to be updated on a risk-graded approach; upper subcritical limits have been documented and criticality hazard identification studies have been completed for all nuclear criticality controlled areas. In addition, criticality accident mitigation measures are documented.

Implementation of the NCS Program has been enhanced through:

- Updating of criticality safety documents to meet current standards per the risk-graded approach;
- Criticality hazard identifications prepared for nuclear criticality controlled areas;
- A training process that categorizes all staff based upon their involvement with fissionable materials;
- Annual delivery of the NCS course and availability of computer-based refresher training;
- Continuing to provide technical and regulatory site-wide support to various CNL groups to improve and strengthen program processes; and
- Holding semi-annual meetings with CNSC staff to provide updates on the status of the NCS Program.

5.4.2.1 Past Performance

During the 2020 to 2024 licence period, the NCS Program at WL has been:

- Continuing to provide technical and regulatory site-wide support to various CNL groups to improve and strengthen the NCS Program processes;
- Holding semi-annual meetings with CNSC staff to provide updates on the status of the NCS Program;
- Providing general NCS training to WL; and
- Providing NCS Program review on WL engineering risk assessments.

Several criticality safety documents are currently under revision to allow retrieval of waste from the WMA and CCSF.

5.4.2.2 Future Plans

Plans for the next licence period include revision of existing criticality safety documents for the CCSF, SF, and WMA. In addition, new documents will be drafted for the operation of the Cask Loading Facility and the Intermediate-Level Liquid Waste Processing Centre.

5.5 Physical Design

Compliance with the Physical Design SCA is accomplished by implementing the Design Engineering Program and the Configuration Management Program, along with a Pressure Boundary Program. Each is described below.

5.5.1 Design Engineering Program and Configuration Management Program

The Design Authority and Design Engineering Program maintains and controls the design basis of CNL sites within approved safety margins and regulatory requirements. It establishes the requirements for CNL design work and applies to all design engineering activities performed at all CNL sites. The purpose of the Design Engineering Program is to ensure that design is planned, executed, verified, and documented according to applicable codes, standards, and regulatory and design customer requirements.

The Design Engineering Program complies with:

- CSA N286 *Management System Requirements for Nuclear Facilities* ; and
- CSA N285.0 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26] when it is applied in conjunction with the applicable pressure boundary quality assurance manuals.

The WL change control process is governed by the Configuration Management Program, which is the mechanism the Design Engineering Program employs to ensure changes are assessed, designed, reviewed, controlled, implemented, and appropriately captured in compliance with relevant safety and configuration management requirements. The Configuration Management Program provides the framework to maintain and control the physical configuration of

structures, systems, and components at CNL. This program applies to all design, operations, decommissioning, and maintenance activities, as executed by all management, supervision, staff, and contractors. It applies to all non-nuclear and nuclear documents, policies, programs, and procedures containing information or instructions that could impact:

- Design (both regulatory and non-regulatory);
- Any plant physical configuration; or
- Any configuration item or information.

The WLRP employs the CNL suite of design planning, development, and review procedures to the design works produced internally and to design works produced by others.

5.5.1.1 Past Performance

The Design Authority and Design Engineering Program ensured that items important to safety met and maintained their design basis and that any changes made were controlled through the Engineering Change Control process. Whiteshell Laboratories engineering transitioned from a Microsoft Windows-based file server storage system to using the AutoCAD Vault system for storing all drawings and documents prepared by engineering.

The Certificate of Authorization from Engineers and Geoscientists of Manitoba was renewed every year before its expiry on April 30 during the licence period.

5.5.1.2 Future Plans

Whiteshell Laboratories will continue to adhere to the Design Authority and Design Engineering Program. All design activities performed at WL will be planned, designed, executed, verified, and documented according to applicable codes, standards, and regulatory and customer requirements. The Design Authority and Design Engineering Program will ensure that items important to safety meet and maintain their design basis and that any changes are controlled through the Engineering Change Control process. The Certificate of Authorization from Engineers and Geoscientists of Manitoba will be maintained current.

5.5.2 Pressure Boundary Program

The WL Pressure Boundary Program establishes a cross-organizational framework to provide assurance that CNL's obligations and risks pertaining to pressure boundary systems, structures, and components are being executed and managed safely and responsibly, in full compliance with the applicable codes, standards, and regulatory requirements. The program is governed by a quality assurance plan that is specifically designed to ensure the compliance of pressure boundary systems at WL.

The WL quality assurance plan for pressure boundaries defines the pressure boundary requirements applicable to design, procurement, fabrication, installation examination, testing, repair, modification, and maintenance of pressure-retaining systems and components. The Certificate of Authorization from Inspection and Technical Services Manitoba lists the scope of pressure boundary activities that can be completed by WL personnel.

The Pressure Boundary Program is maintained in compliance with CSA N285 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26], CSA B51 *Boiler, Pressure Vessel and Pressure Piping Code* [27] standards, and other standards referenced in CSA B51 *Boiler, Pressure Vessel and Pressure Piping Code* [27].

All pressure boundary systems are classified under the Code Classification Procedure required by the CSA N285 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26] standard.

5.5.2.1 Past Performance

The Certificate of Authorization for WL's Pressure Boundary Program was renewed on 2021 August 10, and it is current until 2024 August 10. This Certificate of Authorization will be renewed during the licence period, after the submission of this document to the CNSC. A self-assessment of the Pressure Boundary Program was completed in 2023 June to provide assurance to CNL that WL's Pressure Boundary Program meets the requirements outlined in the program requirements and the LCH [12]. The self-assessment concluded that the Pressure Boundary Functional Support Area meets the requirements and recommended that a gap analysis be completed against implementation of the latest version of CSA N285 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26] and CSA B51 *Boiler, Pressure Vessel and Pressure Piping Code* [27]. The gap analysis resulted in an action plan designed to align the WL implementing documents with CSA N285.0-17 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26].

Whiteshell Laboratories code classifications and design registrations were revised in 2023/2024 to incorporate changes to CSA N285.0-17 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26]. The latest version of the revised procedure was submitted to the CNSC staff 2024 January 09.

5.5.2.2 Future Plans

Plans for the Pressure Boundary Program include:

- Ongoing application of the Design Authority and Design Engineering and Configuration Management programs;
- Ongoing participation in CNL engineering self-assessments and performing additional engineering oversight self-assessments;
- Revising the System Classification Lists for all Pressure Boundary systems at WL per CSA N285.0-17 *General Requirements for Pressure-Retaining Systems and Components in CANDU Nuclear Power Plants* [26], along with CNSC staff comments; and
- Revising the pressure boundary quality assurance plan.

5.6 Fitness for Service

The Fitness for Service Program is implemented through the Fitness for Service Functional Support Area. The program aims to improve the reliability of important systems and thereby minimize nuclear and safety risks, improve operating performance, and enhance compliance with regulatory requirements.

During the WLRP, on-site structures and systems must be maintained in an operable state to ensure compliance with regulations and to support the closure mission. Whiteshell Laboratories' Fitness for Service Program work includes preventative and corrective maintenance, equipment operational checks, and alarm checks, along with periodic inspections of the state of structures and housekeeping inspections.

Preventative and corrective maintenance is carried out on WL's nuclear and non-nuclear facilities' safety systems. Activities focus on those aspects of buildings, structures, and grounds required to maintain personnel and structural safety, protection of assets, protection of the environment, and support of the closure mission. Maintenance is carried out by qualified maintainers.

Preventative maintenance of safety-related systems in WL's nuclear facilities is conducted in accordance with each facility's maintenance plan, manufacturer's specifications, and approved maintenance procedures. Preventative maintenance is defined as the pre-planned routine testing, calibration, inspection, service, and overhaul of safety-related systems, structures, and components. Preventative maintenance is performed to prevent failures from occurring and to assure the continuing capability of the system, structure, or component to perform its design function.

5.6.1 Fitness for Service Program

The maintenance tasks and frequencies specified in the facility maintenance plan are based on recommendations from qualified engineering and maintenance personnel and available vendor data. Corrective maintenance follows the same process but is undertaken when a system, structure, or component is not performing its design function. Maintenance functions are planned and tracked in the site maintenance database.

Operations personnel perform functional checks of systems and alarms within the facilities to ensure systems required to operate are functioning correctly. This includes a regime of daily, weekly, monthly, quarterly, semi-annual, and annual checks as described in operating procedures. Regular (monthly) housekeeping inspections are also part of this process. Fire protection systems undergo periodic inspection and testing per the *National Fire Code of Canada* [28]. Deficiencies from these inspections are corrected by operations personnel. Alternatively, requests for items requiring corrective maintenance are submitted through the site planning and maintenance group.

Under the long-term EAFP (see Section 5.9), concrete waste storage structures (bunkers) are assessed under a periodic inspection plan, which was implemented to confirm their ongoing fitness for service. The periodic inspection plan describes methods for conducting scheduled

inspection surveys of these facilities. An inspection is defined as examination, measurement, and testing work done to ensure the bunker systems are functioning as designed and the bunkers remain fit for service. The inspections are documented annually, with preventative maintenance and repairs occurring as needed.

5.6.2 Past Performance

Preventative and corrective maintenance continued to be performed. Preventative maintenance was optimized by ensuring systems that were under this program were those required for nuclear safety, personnel safety, compliance, operational need, and environmental protection. Historical systems no longer required for these functions were removed from the preventative schedule to allow resources to focus on those systems required; however, recent reviews have shown the need to bring some equipment removed from preventative maintenance back into the maintenance system. This is in part due to the longer time anticipated to fully decommission the WL Site and a re-examination of the previous decisions on preventative maintenance reduction.

Preventative or corrective maintenance and testing of WL's safety-related systems are carried out to ensure the systems are fit for service. Situations where there is evidence of deteriorating conditions or suggestions of an increased probability of upcoming failure are addressed as they are identified through the WL work request system. Issues with missed preventive maintenance activities were identified in 2021 and reported to the CNSC. A corrective action plan was developed and implemented to fix the issues and prevent recurrence. In 2023, the actions taken were found to not be fully effective, and additional corrective actions are being taken.

Housekeeping inspections have continued, and corrective actions (i.e., ImpActs) from the inspections are managed and prioritized by maintenance. To address missed preventative maintenance, and the increased workload of site maintenance personnel, a separate maintenance group was established in December 2022 that is supported by the WL Site planning and maintenance group.

The annual inspections of WL WMA concrete bunkers are conducted in accordance with the periodic inspection plan, and repair items are identified, tracked through the WL work request system, and completed. Additionally, quarterly inspections of the CCSF take place and have shown no significant cracking or spallation. As with the WMA concrete bunkers, preventative maintenance and repairs are performed as required.

In 2022, the Aging Management Program assessed ongoing programs against REGDOC-2.6.3, *Aging Management* [29]. The assessment determined that WL implements the appropriate portions of the guidance document, despite it not being part of the current licensing basis. In 2023, a review was conducted that recommended several actions including replacement of the Computer Maintenance Management System, assessment of the scope of WL fitness for service, and increasing staffing to support required maintenance.

5.6.3 Future Plans

Preventative and corrective maintenance will continue to be performed. As systems and structures are decommissioned, they are removed from service and preventative maintenance tasks are removed from the system. Facility maintenance plan updates remain on a five-year review cycle.

The Fitness for Service Program will continue to ensure operability of WL Site facilities until they are decommissioned. As bunkers at the WMA are decommissioned, they will be removed from service and from the periodic inspection plan's preventative maintenance and inspection schedule.

5.7 Radiation Protection

The RP Program applies to the operation and activities that affect the safety of staff and equipment in terms of exposure to ionizing radiation at all CNL sites. The program is applied to all employees and other personnel (e.g., visitors and contract staff) conducting work at CNL sites. The RP Program applies to all activities conducted where CNL holds a Licence issued by the CNSC in Canada. Canadian Nuclear Laboratories' dosimetry services are licensed by the CNSC under the CNL Dosimetry Service Licence (15193-1-26-4) [30].

The objective of the RP Program is to ensure and demonstrate compliance with applicable CNSC regulations and maintain doses to workers ALARA, considering social and economic factors. Canadian Nuclear Laboratories applies the ALARA principle to all activities involving the use of ionizing radiation. All radiation doses to personnel or members of the public must be justified, in accordance with the ALARA principle, and maintained below regulatory limits.

5.7.1 Radiation Protection Program

Canadian Nuclear Laboratories' RP Program is designed and implemented to ensure CNL complies with, or exceeds, the level of radiation safety that is required by the *Radiation Protection Regulations* [31] and the NSCA [15].

The CNL Corporate RP Program develops and provides oversight of the RP Program across CNL sites. The provision, management, and oversight of site-specific radiation protection at WL is provided by the WL RP Branch. Branch staff include health physicists, dosimetry staff, radiation surveyors, radiation protection assistants, and decontamination operators, along with laundry and respirator maintainer staff.

The fundamental objectives of the CNL RP Program are:

- **Justification:** to ensure no activity involving exposure to radiation is performed unless it produces a sufficient benefit to the exposed individual or to society to offset the radiation detriment it causes;
- **Optimization:** in relation to a specific source of exposure within an activity, the magnitude of individual doses, the number of people exposed, and the likelihood of incurring exposures where these are not certain to be received are kept ALARA, considering economic and social factors; and

- **Dose limitation:** the exposure of individuals resulting from all activities are kept below applicable dose limits.

5.7.2 Past Performance

Whiteshell Laboratories uses CNL's CNSC-licensed dosimetry services for external and internal radiation dosimetry for WL staff, contingent workers, and contractors. Capability for performing operational dose monitoring was maintained at WL including the provision of electronic personal alarming dosimeters, supplementary control extremity dosimeters, and workplace air monitors. A whole-body counter was previously situated in Building 402 (now decommissioned) and is being installed and commissioned within the new Building 543, which is currently under construction.

Whiteshell Laboratories employs external calibration service providers for portable radiation monitoring instruments. Other RP instrumentation was calibrated by CNL instrumentation technicians.

Radiation Protection trainers from WL provided Group 4, 3, and 2 RP training to workers. Recently hired radiation surveyors and health physicists received Group 1 RP training, as required, from the RP Training and Development group located at the CRL Site.

Radiological work was planned in accordance with the WL integrated work control process and the CNL RP Program governing document for the ALARA review and planning of radiation work. Health Physics and RP staff were engaged to provide radiological safety and ALARA assessments, authoritative advice regarding radiation protection matters, and oversight of the execution of radiation work. Radiological work plans in the form of radiological hazard and precautions sheets were prepared by WL Health Physics staff to communicate to field work teams the associated radiological hazards and the radiological hazard controls and safety measures to be implemented for specific work packages.

Radiological clearance surveys of surplus material and buildings to be demolished were planned and conducted by RP staff in accordance with WL procedures for radiological clearance of buildings, lands, and materials and by means consistent with the recommendations contained in US-NUREG-1575 (MARSSIM) [32], US-NUREG-1575, Supp. 1 (MARSAME) [33] and CSA standard N292.5-11 Guideline for the Exemption or Clearance from Regulatory Control of Materials that Contain, or Potentially Contain, Nuclear Substances [34].

Successful implementation of the RP Program has ensured WL's continued operation in compliance with CNSC regulations with no regulatory dose limits or action levels being exceeded during the licence period and individual and collective doses (see Table 9) remaining ALARA. To assist with execution, CNL may perform thorough pre-work mock scenarios to inform work planning and ensure the safety of workers and protection of the environment prior to undertaking higher hazard tasks. Some examples of pre-work practice events are presented in Figure 16. Using the CNL management system and ImpAct reporting process, issues were identified, reported, and resolved in a timely manner. Weekly and quarterly RP performance reviews were undertaken to identify performance trends and track program corrective actions and improvement initiatives.

Figure 16: Pre-work mock trials and rehearsals prior to vacuuming and transportation.

5.7.2.1 Worker Dose Control

Full-time staff at WL are designated as nuclear energy workers (NEWs). Contractors and visitors who could receive annual doses approaching or exceeding the WL dose action level for non--NEW of 0.3 millisieverts (mSv) in a three-month period or 0.7 mSv in a year were designated as NEWs. Nuclear energy workers were subjected to the regulatory prescribed dose limits and the WL dose action levels for a NEW. Other workers and visitors were subjected to dose limits and action levels for a person not designated as NEWs. There were no individual doses exceeding the assigned dose control point during the licence period.

All radiation dose obtained by CNL and contract staff are consolidated and reported to the CNSC annually as part of the annual compliance monitoring reports. The effective (whole-body) doses for NEW and non-NEW persons between 2020 and 2023 are shown in Table 9. There were no assigned doses because of skin contamination or an internal contamination intake exposure. Worker dose decreased in 2021 after the completion of Building 200 ALWTC decommissioning activities and is expected to remain low until future work begins involving retrieval of intermediate-level solid waste from the WMA.

Table 9: Whole-body dose statistics, 2020 to 2023.

Dose Statistic	2020	2021	2022	2023
Persons Designated as Nuclear Energy Workers				
Number of People	376	472	570	727
Average Whole-Body Dose (mSv/yr) [a]	0.09	0.04	0.03	0.02
Maximum Individual Whole-Body Annual Dose (mSv/yr)	2.97	0.57	0.31	0.21
Collective Dose (person-mSv)	33.44	18.72	17.18	17.25
Persons Not Designated as Nuclear Energy Workers (employees, contractors, visitors)				
Number of People	183	389	520	424

Dose Statistic	2020	2021	2022	2023
Average Whole-Body Dose (mSv/yr) [a]	0.00	0.00	0.00	0.00
Maximum Individual Whole-Body Annual Dose (mSv/yr)	0.00	0.11	0.01	0.10
Collective Dose (person-mSv)	0.00	0.27	0.01	0.23

a WL dose action level is 6 mSv per year for NEWs and 0.7 mSv for non-NEWs.

Routine radiation surveys were performed by RP staff to confirm that the radiological safety zones are correctly designated, areas with local elevated radiation doses rates are posted in accordance with the *Radiation Protection Regulations* [31], and sufficient access control provisions are in place. In the current licence period, there were no occurrences of dose rates exceeding permissible levels for the designated radiological safety zones and there were no occurrences of workplaces with accessible dose rates exceeding 25 microsieverts per hour (µSv/h) not being posted or with inadequate access control.

Routine contamination surveys of workplaces, material transfers, and personnel exiting nuclear facilities and controlled areas were used to confirm the absence of unknown contaminated material or the spread of contamination. Workplace air monitors were employed to confirm the adequacy of controls and to warn of abnormal of unplanned airborne contamination conditions. For decontamination work, strippable gel was applied as part of the decommissioning process to seal, remove, and reduce the spread of contamination (see Figure 17). The number of personnel, workplace, and material contamination events is presented in Table 10. There were no airborne contamination exposure events or radioactive material spills.

Figure 17: Application of decontamination strippable gel during Building 200 decommissioning.

Table 10: Contamination events, 2020 to 2023.

	Skin and Clothing Contamination			Workplace Contamination	
	Skin [a]	Personal Clothing [a]	Radiological Work Clothing [b]	Surface [c,d]	Vehicle / Materials [b,c]
2020	2	0	3	1	1
2021	0	0	0	1	11
2022	0	0	0	2	2
2023	0	0	0	0	1

a Total contamination found is greater than 1 becquerel per square centimetre (Bq/cm^2) beta-gamma or 0.2 Bq/cm^2 alpha over a 100 square centimetre (cm^2) averaging area.

b Total contamination found is greater than 4 Bq/cm^2 beta-gamma or 0.4 Bq/cm^2 alpha over a 100 cm^2 averaging area.

c Removable contamination found is greater than 0.2 Bq/cm^2 beta-gamma or 0.01 Bq/cm^2 alpha over a 300 cm^2 averaging area for Contamination Zone 1 areas.

d Removable surface contamination found is greater than ten times the maximum allowable levels for Contamination Zone 2 and higher designated areas.

5.7.2.2 Public Dose Estimate

Public radiation dose estimates are determined as required based on environmental monitoring as outlined in Section 5.9.2.

5.7.2.3 Radiation Protection Program Performance

The CNL RP Program was monitored and improved as necessary to ensure that CNL's radiation safety complied with or exceeded the requirements specified in the NSCA [15] and the associated *Radiation Protection Regulations* [31].

A revised program requirements document and program description document for the CNL RP Program was issued in 2021. The CNSC baseline RP Type II Inspection conducted in 2022 revealed no non-compliances and raised no enforcement actions (Table 5).

A new training analysis and training plan was issued by the CNL RP Training and Development group in 2023. Lesson plans were prepared and WL RP training materials were updated to align with this document. Standardized training qualification cards were introduced to formally document the training and qualifications of RP trainers.

There were no lost or stolen radiation sources. Leak testing was completed as required, with all sources passing their leak tests.

Radiation protection improvement initiatives completed during the current licence period included:

- WL controlled area reduction initiative completed for the WL Site north side;
- Introduction of air-ventilated full-body plastic suits for high airborne contamination risk work;

- Introduction of water- and chemical-resistant protective suits;
- Air dispersion model developed to support planning of nuclear building demolition;
- Implementation of a radioactive and contaminated material transfer form and awareness training;
- Implementation of process for the registration of radioactive material storage areas;
- Introduction of alpha-beta scintillation floor contamination monitors for building release monitoring;
- Introduction of a new telescoping radiation survey meter;
- Implementation of survey meter calibrations by an external RP instrumentation calibration service;
- Application of fixatives and grouting for building demolition (Figure 18);
- Application of water misting for dust suppressant during nuclear building demolition (Figure 19);
- Application of a fixative agent on contaminated building debris piles for contamination control during nuclear building demolition (Figure 19);
- Introduction of enhanced surface and airborne contamination monitoring during nuclear building demolition;
- Enhanced personal protective clothing and equipment requirements implemented for work in Radiological Safety Zone 2 and 3 work areas;
- Implementation of RP housekeeping and radioactive material storage area compliance checklists used by field RP staff; and
- Implementation of new radiological barriers to delineate boundaries of radioactive material areas, areas of elevated dose rates, and contaminated areas.

Figure 18: Grouting and fixatives for Building 200 demolition.

Figure 19: Application of water misting and a fixative agent during Building 200 open air demolition.

5.7.3 Future Plans

Future planned changes and improvements in the provision of radiation protection at WL include:

- Replacement of the radiological hazard and precaution sheet with a radiological work permit to align with radiological safe work documents used at other CNL sites;
- Introduction of training qualification cards for Group 1 and Group 2 WL RP staff;
- Introduction of a new Tyvek suit with enhanced protection at the neckline and against tears;
- Upgrade and replacement of area radiation monitors and contamination air monitors in nuclear facilities that will be put into operation or remain in operation;
- Application of nuclear building demolition methods and controls to the remediation of WMA waste trenches and WL affected lands;
- Reconfiguring the Building 100 and WR-1 radiological supervised areas and controlled areas to provide enhanced contamination control for WR-1 decommissioning. This includes re-establishing the Building 100 change room for radiological work and introduction of two-step alpha-beta whole-body surface contamination monitor; and
- Assessing WL dose action levels to reflect anticipated increase of planned worker doses during the retrieval of ILW from the WMA standpipes.

5.8 Conventional Health and Safety

The CNL Occupational Safety and Health (OSH) Program applies to all work performed by CNL employees and to all work performed on CNL-controlled sites or workplaces, including WL. Contractors hired by CNL for work at WL must ensure compliance with all applicable federal, provincial, and municipal legislation and associated regulations and the regulators who are the Authority Having Jurisdiction. Throughout the onboarding, work performance, and work

closure, WL OSH provides guidance and oversight to contractors working on CNL property, as it pertains to the OSH Program requirements and CNL's integrated work control process.

5.8.1 Occupational Safety and Health Program

The scope of the OSH Program includes the processes for the management of hazards to health and safety of employees and other persons at CNL sites and workplaces Figure 20. The program follows CNL program description and requirements documents. The purpose of the OSH Program is to prevent accidents and injuries to health arising out of, linked with, or occurring to employees in the course of employment, and to all persons on sites or workplaces controlled by CNL. Whiteshell Laboratories continues to be proactive in the approach to safety.

Figure 20: Photograph of the safety signage along the access to the Whiteshell site.

5.8.2 Past Performance

During the licence period, WL continued to track health and safety performance and promote a nuclear safety culture throughout the facility. The number of hours worked and lost-time injuries for employees and contractors are presented in Table 11.

Table 11: Whiteshell Laboratories person hours worked and lost-time injuries, 2020 to 2023.

	2020	2021	2022	2023
WL Employees				
Person Hours Worked	584,030	684,000	812,000	769,540
Lost-Time Injuries	1	0	0	4
Working Days Lost	2	0	0	25
Frequency [a]	0.34	0	0	1.04
Severity [b]	0.68	0	0	6.50
WL Contractors [c]				
Lost-Time Injuries	0	0	0	1
Working Days Lost	0	0	0	4

a Frequency rate equals number of lost-time injuries × 200,000 hours of exposure divided by person hours worked (based on 100 full-time workers).
b Severity rate equals number of working days lost × 200,000 hours of exposure divided by person hours worked (based on 100 full-time workers).
c The number of person hours worked is not divulged by contractors. Therefore, frequency and severity rates cannot be calculated.

While there was an increase in 2023 in lost-time injuries, these are not related to the WL Site safety stand-down. Two lost-time injuries were the result of slips on ice, one was the result of an employee rolling their ankle during a security “use of force” training exercise, and one was a firefighter who sustained injury during a physical training session.

In response to changing work conditions due to COVID-19, CNL conducted a mandatory one-day safety pause across all sites on 2020 September 01. The pause allowed all to refocus and prioritize safety in the workplace prior to a safety stand-down being implemented on 2020 November 16.

Over the licence period, WL demonstrated its unwavering commitment to safety as evidenced by decisive actions (e.g., safety stand downs) and oversight. These initiatives exemplify WL's proactive stance towards safety and CNL’s dedication to continuous improvement in health and safety practices.

5.8.3 Future Plans

Canadian Nuclear Laboratories will continually improve its practices and approach to manage its health and safety obligations and strive for a culture of excellence in safety through a variety of practices, awareness campaigns, and initiatives.

In the coming year, WL aims to improve its health and safety framework by continuing to implement targeted training sessions aimed at enhancing hazard recognition and mitigation skills. These efforts will be complemented by review of planning documentation and walk-downs, regular participation in pre-job meetings, and regular safety audits and inspections to

ensure adherence to established protocols and identify areas for improvement. Through these proactive measures, WL remains steadfast in its dedication to fostering a culture of safety excellence across all operational domains.

Safety is a core CNL value. Canadian Nuclear Laboratories will continue its unyielding commitment to ensure all OSH obligations are met and continually improve.

5.9 Environmental Protection

The Environmental Protection Program implements CNL's Environment Policy and ensures environmental compliance and obligations are fulfilled, as applicable, at CNL-operated sites in Canada.

The Environmental Protection Program applies to operations and activities that may affect the environment in and around CNL sites. A graded approach to requirements is applied based on environmental risks or events that could occur at any given location and considering the amount of control or influence that CNL has on the activity. The Environmental Protection Program also applies to all CNL employees, contractors, and consultants conducting work at CNL sites. Program staff are also involved in organizing on site activities like the annual Earth Day clean-up (Figure 21).

Figure 21: Photograph showing the garbage collected during the Earth Day clean-up.

Environmental performance is assessed through an integrated monitoring program composed of three components: effluent verification, environmental, and groundwater monitoring (see, for example, Figure 22 and Figure 23). Together, these three components comprise

contaminant pathway monitoring, enabling the tracking of contaminants throughout the different parts of the geosphere and biosphere.

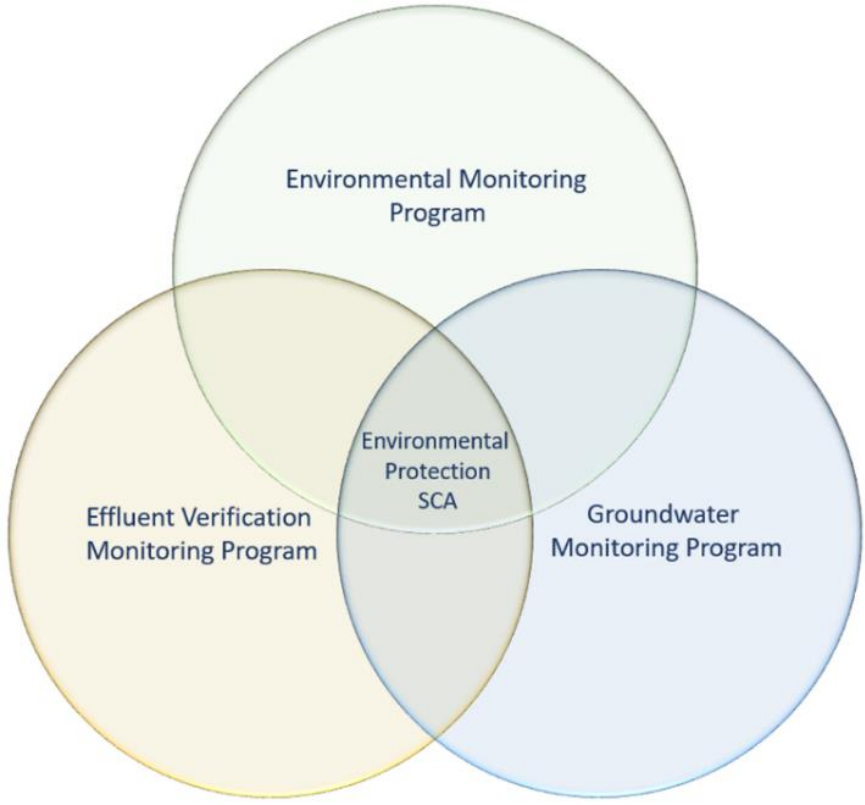


Figure 22: Diagram of Whiteshell integrated environmental monitoring program.

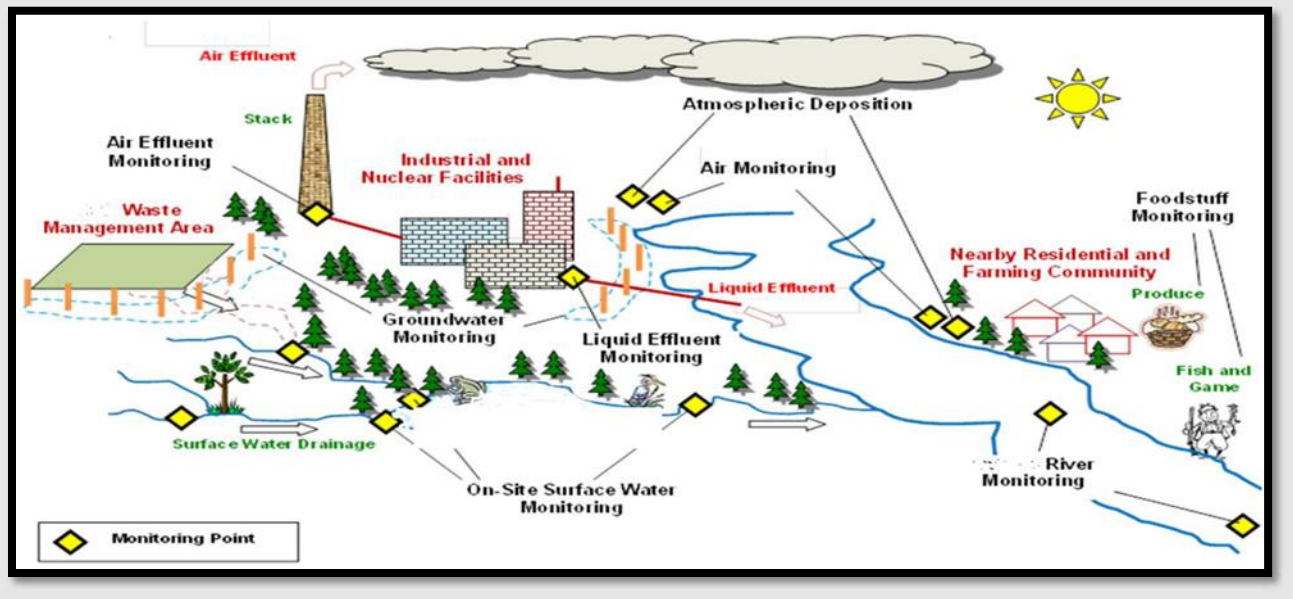


Figure 23: The integrated environmental monitoring program concept.

Environmental monitoring includes measurement of ambient gamma radiation, as well as sampling and analysis of drinking water (Figure 24), air, fish, wild game, garden produce, and river sediments. An integrated approach to environmental monitoring means that the evaluation of impacts on the environment from WL facilities and operations is carried out in a logical, comprehensive manner and is used to demonstrate compliance and protection of the environment and health and safety of the public.

Figure 24: Performing river water sampling using ice auger on Winnipeg River.

Canadian Nuclear Laboratories has implemented and maintained an Environmental Protection Program that includes a set of administrative levels, action levels, and derived release limits that are aligned with:

- REGDOC-2.9.1 *Environmental Protection: Environmental Principles, Assessments and Protection Measures* [35];
- CSA N288.4 *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [36];
- CSA N288.5 *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [37];
- CSA N288.6 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* [38];

- CSA N288.7 *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [39]; and
- CSA N288.8 *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities* [40].

Levels and limits are used to monitor against CNSC-approved environmental parameters to ensure protection of workers, the public, and the environment from licensed nuclear activities. Action levels are set below release limits to identify potential loss of control events so that problems are addressed before they reach the release limit level. Both action levels and release limits are set to be highly protective of the environment. Whiteshell Laboratories has reported to the CNSC, as required, when an action level or release limit has been reached.

When action levels are exceeded, CNL initiates an investigation to evaluate any loss of control and impact on personnel, the public, and the environment. After an investigation is complete, CNL takes any required steps to evaluate the potential public or environmental impact and prevent recurrence. Action levels specific to radiation dose to workers or members of the public have been established and accepted by the CNSC and will be used exclusively. Action levels, if triggered, initiate a health physics assessment using site-specific parameters to assess the potential dose to workers or members of the public.

An EAFP was implemented at WL in 2002 following the Government of Canada's acceptance of the decommissioning Comprehensive Study Report [1]. The CNSC subsequently issued a Decommissioning Licence for WL [2], which is the focus of the EAFP. The targets for the program have been achieved every year, and results are documented in an annual report to the CNSC. Collected information is being used to help verify the accuracy of the pre-decommissioning environmental assessment and confirm that appropriate mitigation measures are taken. In addition, the results assist in development of appropriate responses should unforeseen events occur and aid in identifying effects from the WLRP that may not have been predicted.

Overall, the environmental impact of the WLRP to date can be characterized as low, in that the potential for human or ecological impact is low and overall trending indicates stable performance, with no cases of widespread degrading condition.

5.9.1 Environmental Protection Program

The WL Environmental Management System is registered to ISO 14001:2015 [41]. As an ISO 14001 certified site, WL has gone through annual Environmental Management System audits. These annual audits are required to verify the effectiveness of the system and to strive for continuous improvement of CNL's environmental performance. The WL Site has maintained its ISO 14001 registration since initial registration in 2010. Additionally, regular evaluations of compliance to environmental legal requirements are carried out.

5.9.2 Past Performance

Since 2019, a focus of the Environmental Protection Program has been changes to ensure the program is compliant with the requirements of the CSA N288 series of standards. The program has also focused on improving relationships with surrounding Indigenous communities, including the MMF.

The total number of incidents where a parameter was over a CNL monthly guideline (all non-radiological) at any of the monitoring points over the last four years is shown in Figure 25. It is important to note that in a single incident, multiple parameters may exceed the monthly guideline limits, and the number of exceedances is not reflective of the total number of incidents. Of all these incidents, though, many of them led to administrative levels being exceeded at upstream monitoring locations where investigation into the causes occurred, and mitigation measures were put in place to prevent more impactful effects from occurring at final points of discharge.

There was only one incident when an action level or regulatory limit was exceeded on an effluent stream discharging directly to the environment between 2020 and 2024 May 31. This occurred in 2022 and pertained to manganese concentrations being observed at the outfall monitoring station for the months of July to October. Excessive levels of sediments were entering the storm drain system, and the surrounding soil in the area is naturally high in manganese. These exceedances led to a renewed vigour in conducting street cleaning operations after the spring melt and after major demolition projects. In addition, the Environmental Protection Program increased the frequency of roadway inspections to prevent reoccurrence.

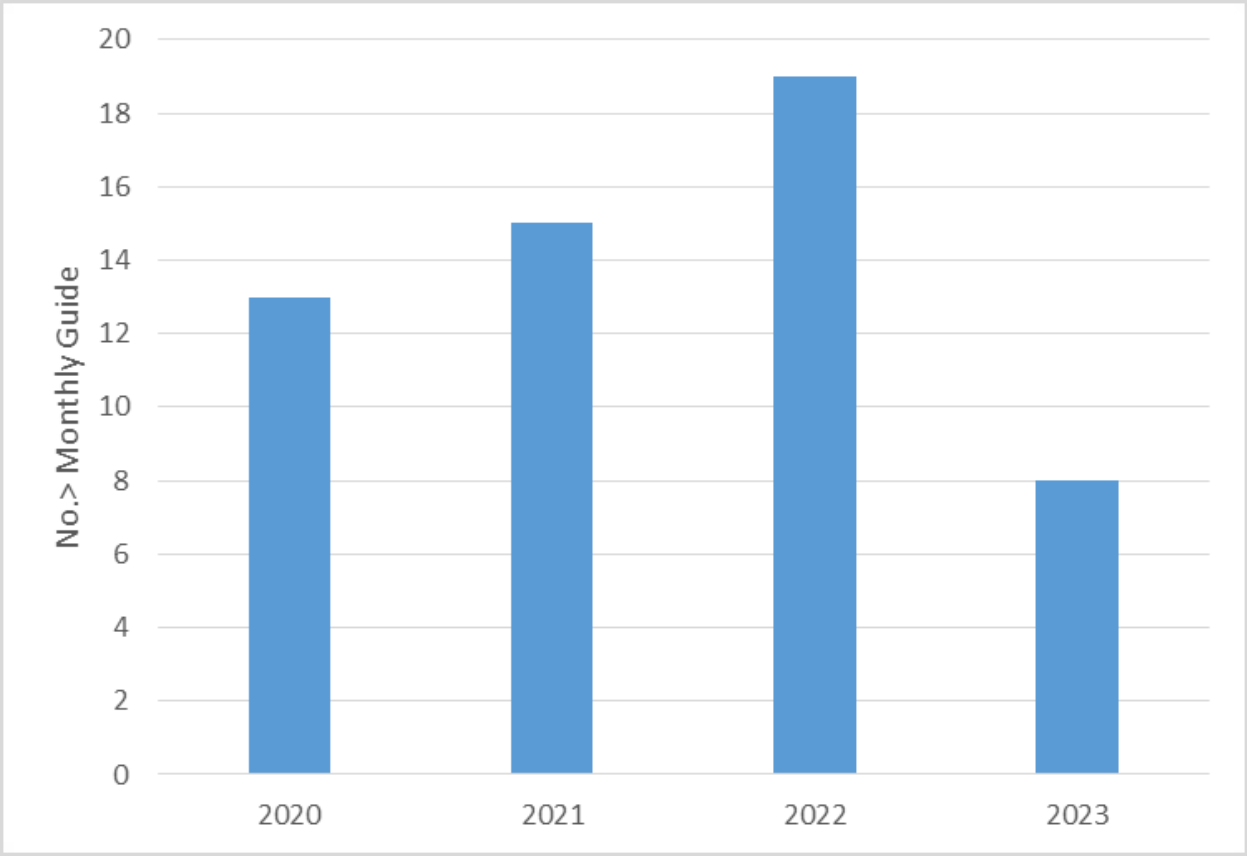


Figure 25: Non-radiological monitored effluent parameters above monthly guidelines.

Estimated doses to critical groups are summarized in Table 12. All airborne and liquid effluent monitoring results for the current licence period are consistent with the cleanup and operational activities associated with decommissioning of the WL Site and indicate that CNL has taken reasonable precautions to control the release of radioactive nuclear substances on site and into the environment. The results of the monitoring demonstrate that the current controls for the release of potentially hazardous substances continue to provide substantial protection of the environment.

Table 12: Estimated dose to critical groups from Whiteshell operations, 2020 to 2023.

Year	Dose from WL Liquid Effluents (mSv)	Dose from WL Air Emissions (mSv)
2020	6.71E-03	1.87E-06
2021	4.49E-03	1.91E-06
2022	5.78E-03	1.52E-06
2023	2.00E-03	1.50E-06

Canadian Nuclear Laboratories submitted a site-wide Environmental Risk Assessment to CNSC staff in 2023, to be compliant with CSA N288.6-12, *Environmental Risk Assessments at Class I*

Nuclear Facilities and Uranium Mines and Mills [38]. Comments were received from CNSC staff and CNL is in the process of dispositioning comments, with the expectation to have the revised Environmental Risk Assessment resubmitted to CNSC staff for acceptance prior to the licence hearing.

Seven internal and external environmental audits that involved the WL Site have been conducted over the last five years. All findings of these audits have been addressed. The audit process is critical for the environmental monitoring program's ability to continuously improve, as both internal and external audits evaluate the program and identify areas where the program can improve. The Environmental Protection Program falls under the framework of CNL's larger environmental protection functional support area, and that the two programs are often evaluated in conjunction with one another. In 2023, CNSC conducted a focused Type II Environmental Protection Inspection. Two notices of non-compliance have been raised (see Table 5). To date, CNL has addressed the first non-compliance and ensured that plans for environmental monitoring, effluent verification monitoring, and groundwater monitoring are reviewed annually. To address the second non-compliance, WL is currently in the process of updating WL's Environmental Protection Program staff training records and ensuring that identified training gaps have been addressed and the records are filed. Canadian Nuclear Laboratories is committed to completing the corresponding corrective actions by 2024 September.

Whiteshell Laboratories is advancing reconciliation with Indigenous communities by inviting representatives to observe and witness various Environmental Protection Program work. This work is implemented to monitor effluent, collect samples for laboratory analysis (Figure 26), and collect samples to monitor the surrounding food supplies. Results are communicated through various public speaking and engagement events. Input from these interactions has also been incorporated to expand environmental monitoring to include additional food items that have been identified as valued components to the surrounding communities' way of life. This includes collection and analysis of fish samples and of other country foods such as field berries, wild rice, and mushrooms (Figure 27). Canadian Nuclear Laboratories has also begun to help Indigenous Nations to establish their own environmental monitoring programs, and once knowledge is able to be shared, will help further the scope and range of CNL's Environmental Protection Program.

Figure 26: Collecting water samples from a ditch.

Figure 27: Mushroom picking.

5.9.3 Future Plans

In the coming years, the WL Environmental Monitoring Program would like to upgrade its monitoring capabilities. As new regulatory requirements and expectations come into effect, the Environmental Protection Program will continually evolve to include these new requirements while still providing the same services currently being offered.

The Environmental Protection Program is also working closely with the WL communications and engagement team to foster growth in the relationship between the surrounding First Nations and the MMF, as CNL strives to collaborate to ensure environmental resources are protected.

5.10 Emergency Management and Fire Protection

The WL Emergency Management Program and Fire Protection Program are based on compliance with REGDOC-2.10.1 *Nuclear Emergency Preparedness and Response*, Version 2 [42] and CSA N393 *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* [43], respectively. All structures are compliant with the *National Building Code of Canada* [44] and *National Fire Code of Canada* [28].

5.10.1 Emergency Preparedness Program

The Emergency Preparedness Program provides an operational framework to implement CNL's Occupational Safety and Health Policy and its Environment Policy with respect to necessary emergency response measures and compliance with company priorities. The focus of the program is the prevention and mitigation of, preparedness for, response to, and recovery from abnormal or emergent events.

The Emergency Preparedness Program specifies the program requirements in the relevant legislation and regulations. The Emergency Preparedness Program consists of preparedness and response elements to ensure that plans, procedures, and resources are in place to manage on-site and off-site emergencies. Drills, exercises, and training (see Figure 28) are scheduled each year to test and improve emergency response capabilities and organizational structures. The program supports local, provincial, and federal emergency response as required through assistant agreements and as directed through the Government of Canada.

Figure 28: Photographs of the Whiteshell fire brigade performing training exercises and drills.

5.10.1.1 Past Performance

Whiteshell Laboratories Emergency Management conducted a range of drills and exercises during the licence period. These consisted of flash drills, targeted communication, and other functional exercises presented in Table 13.

Table 13: Whiteshell Laboratories emergency preparedness exercises, 2020 to 2023.

Type of Drill or Exercise	2020	2021	2022	2023
Fire Drills	10	2	9	7
Site-Wide Specialty Drills	56	106	86	124
Tabletop Exercises	2	5	1	16
Targeted Communication Exercises	17	17	17	21
Site-Wide Communication Exercises	8	12	12	12
Field Exercises (functional)	1	1	2	12

A summary of emergency preparedness activities for the licence period is provided below:

- 2020 – Health restrictions required a different approach:
  - Staff resources were redirected to pandemic planning, response, and recovery work.
  - Drills conducted after March were conducted virtually or following health guidelines.
  - There was an overall reduction in drills and exercises conducted due to health restrictions.
- 2021 – Health restrictions continued to be a consideration in completion of drills;
- 2022 – Health restrictions eased, allowing key external response partners to be reintegrated into in-person drills and exercises; and
- 2023 – The WL Emergency Management Program assumed responsibility for delivering fire drills to include functional response elements for both building occupants and the WL Fire Department:
  - There was renewed interest from Pinawa Fire & Rescue Service to train and practise with the WL Fire Department and Emergency Management Program.

Throughout the licence period, WL continued to engage with federal, provincial, and local agencies to plan for and react to emergent situations. Also, there were no instances where the WL Site Emergency Plan was activated.

5.10.1.2 Future Plans

The CNL Emergency Preparedness Program will continue to enable appropriate responses to emergent situations throughout the next licence period. Canadian Nuclear Laboratories will continue to conduct drills and exercises and train employees to ensure that the program is compliant.

5.10.2 Fire Protection Program

The Fire Protection Program applies a risk-graded approach in conjunction with the defence-in-depth principles to WL Site operations and activities as far as they may affect fire protection. Through the incorporation of fire prevention and protection procedures, the Fire Protection

Program continues to reduce fire probability and the risk to life safety, to conservation of assets, to the protection of the environment, and to the continuity of operations.

5.10.3 Past Performance

In 2020 to 2022, the Fire Protection Program was focused on supporting compliance during COVID-19 by supporting the preparation of procedures and guidance to enable work to continue safely. In 2021, a third-party Fire Protection Audit was conducted and resolution to findings were tracked through the corrective action program.

In 2023 April, deficiencies in the implementation of WL's Fire Protection Program were identified through an internal self-assessment and were reported to the CNSC. This assessment determined that training records for members of the on-site fire brigade were incomplete, and therefore CNL could not demonstrate that fire response staff were adequately trained and competent to provide fire suppression activities consistent with the Fire Protection Program for the WL Site. Deficiencies were also identified with maintenance of required fire protection equipment, including the procedures for equipment inspection, testing, and maintenance, and for the use of incomplete or expired personal protective equipment.

The deficiencies identified in the training and equipment of fire response staff had a direct impact on CNL's ability to maintain the minimum complement of fire response personnel. Canadian Nuclear Laboratories took immediate measures to ensure ongoing safe occupancy and to ensure fire protection of the WL Site. These measures included pausing all work on site, except activities required to maintain the WL Site in a safe state and for corrective purposes. Compensatory and corrective actions were put in place to bring the WL Site and WL's implementation of the CNL Fire Protection Program back into compliance with the LCH [12] and CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* [43]. A revision to the required minimum complement of fire response personnel, increasing the overall minimum complement at the WL site, was implemented in 2023 June.

The WL Site implemented a safety stand-down because of the above deficiencies, as a stand-down stops work other than required compliance and maintenance, reducing the risk of fire at the WL site. Compensatory measures were enacted, and the WL Site was placed in a safe state while an extent of condition assessment was performed. Fire response capability was brought in from CRL while training was conducted to help ensure WL staff demonstrated required competencies in their firefighting capabilities. Thirty new firefighters were on-boarded to bolster the on-site fire response capabilities. Fire systems were inspected, and required improvements were made to hydrants, detection systems, emergency lighting, and fire extinguishers. Procedures were also updated.

The WL Fire Department was assessed for effectiveness, and improvements were made. Canadian Nuclear Laboratories developed and submitted a multi-phase restart plan to the CNSC, outlining the requirements set out for the WL Site to transition from one phase to the next and the corrective actions required to be completed to transition to Phases 5 through 8 (the site was in Phase 4 when the plan was submitted to CNSC staff). Canadian Nuclear Laboratories submits evidence to the CNSC that these requirements have been met, and

transition from one phase to the next requires CNSC concurrence. At the end of 2024 June, WL was in Phase 6, and plans to be in Phase 8 in the summer of 2024.

The Fire Department organization was assessed for effectiveness, and improvements were made. Implementation of a new organization for the WL Fire Department includes nine new management positions, as well as a fire protection engineer and fire systems specialist. Considerable support has been and continues to be received from CRL to help ensure Fire Protection Program regulatory compliance at WL.

Vast improvements have been made to WL's fire response capabilities. A new fire engine was procured (Figure 29), and a purpose-built wildfire truck was received in 2024. New structural firefighting gear and wildland gear was obtained. Defence in depth was added to the response capabilities with the additional procurement of specialized firefighting and rescue equipment. All firefighters are National Fire Protection Association (NFPA) 1001 II accredited. Specialized training in wildfire response, extrication, confined space and high angle rescue, water rescue, and hazardous materials have enhanced the fire department capabilities to benefit surrounding communities. In addition, the mutual aid agreement with Pinawa Fire and Rescue Service has solidified through four joint training sessions and an observed regulatory exercise.

An application for access to the Manitoba Public Safety Communication System has been approved. Integration with the Manitoba Public Safety Communication System will allow full communication with municipal police, fire, and emergency medical services. This is a key step in full integration into the Manitoba Fire Service Mutual aid program. The WL Fire Department responded to an off-site motor vehicle incident to provide mutual aid to neighbouring departments while ensuring minimum on-site staffing and regulatory requirements were maintained. This demonstrates WL's ability to facilitate reciprocal agreements with neighbouring fire departments while maintaining compliance.

Figure 29: Push-in ceremony for the new Whiteshell Laboratories fire engine.

5.10.4 Future Plans

The WL Fire Protection Program continues to adapt to the changes on site, including the demolition of buildings/assets, the construction of temporary structures, the number and composition of staffing levels, and the organizational structure. Vacated buildings remain supported by the site-wide emergency procedures, and depending on the activities in the building, emergency placards may be required.

A Memorandum of Agreement is in draft with the Manitoba Emergency Services College to facilitate the delivery of accredited training on site. This agreement will further enhance the training capabilities of both WL firefighters and neighbouring fire departments. This agreement, in collaboration with the planned training facilities, will allow for additional training engagements with First Nations, the MMF, and non-municipal entities. CNL is also planning to build a new on-site fire hall and fire training facility to further enhance WL's Fire Protection Program.

An organizational change is occurring resulting from the 2023 Fire Protection Program non-compliances and subsequent safety stand-down, in which WL Emergency Services Operations, a combined fire and security services department, is separating fire and security resources, operations, and responsibilities. This will improve the overall quality and capabilities of the services and support provided by WL Fire and Security programs.

5.11 Waste Management

The Waste Management Program areas provide oversight, compliance, and services for waste management and cleanup activities associated with decommissioning. The program supports

waste generators to meet strategic priorities for all phases of the waste management life cycle, and associated business needs.

Canadian Nuclear Laboratories is enhancing management of waste to have a truly integrated strategy across the company. The Waste Management Program continues to refine and communicate the *CNL Integrated Waste Strategy* [45] to integrate waste life cycle management across all CNL-operated sites, and to capture the CNL baseline waste strategies and defined pathways for all CNL wastes. Canadian Nuclear Laboratories is taking a holistic view to manage the volumes of waste in an efficient and safe manner and has produced a CNL life cycle waste forecast.

Canadian Nuclear Laboratories will continue to provide waste processing and storage services that protect the environment; comply with regulations; and assure health, safety, and security for future generations of Canadians. This will ensure the continued availability of waste storage facilities, the capability for waste generated at WL to be stored temporarily at WL, and the ability to receive waste from WL at the CRL Site or other licensed waste receivers.

In 2021, the CNSC updated its regulatory documents related to waste management and decommissioning. The following documents are relevant to the WLRP:

- REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada* [46];
- REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste* [8];
- REGDOC-2.11.1, *Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste* [47]; and
- REGDOC-2.11.2, *Waste Management Decommissioning* [9].

At the request of CNSC staff, CNL has completed a gap analysis and prepared implementation plans of both the waste management and the decommissioning regulatory documents, with respect to the WL Licence [2].

In addition to the new regulatory documents, CNL also performed similar gap analyses for the following CSA standards:

- N292.0-19, *General Principles for the Management of Radioactive Waste and Irradiated Fuel* [48];
- N292.3-14, *Management of Low- and Intermediate-Level Radioactive Waste* [49];
- N292.5-11, *Guideline for the Exemption or Clearance from Regulatory Control of Materials that Contain, or Potentially Contain, Nuclear Substances* [50];
- N292.6-18, *Long-Term Management of Radioactive Waste and Irradiated Fuel* [51];
- N292.8-21, *Characterization of Radioactive Waste and Irradiated Fuel* [52]; and
- N294-19, *Decommissioning of Facilities Containing Nuclear Substances* [10].

5.11.1 Waste Management Program

The CNL Waste Management Program is responsible for:

- Setting CNL's waste management governance, including procedures and other supporting materials (e.g., documentation and training materials), in compliance with applicable requirements (e.g., acts, regulations, codes, standards, and guidance documents), internal interfaces, and other stakeholders, and based on industry best practices;
- Developing and maintaining the *CNL Integrated Waste Strategy* [45], which describes how CNL optimizes its strategic approach to waste management;
- Identifying best available options and developing plans for all phases of the waste management life cycle process at CNL-operated sites;
- Identifying and addressing gaps in existing waste management life cycle processes through observation, assessments, and reviews at CNL-operated sites, and benchmarking against other facilities (nuclear and non-nuclear);
- Providing waste oversight and subject matter expert support to waste generators to ensure that the waste management life cycle process and waste hierarchy are implemented in accordance with the applicable policies, procedures, and standards governing these activities;
- Implementing standardized waste characterization across CNL-operated sites to ensure that waste meets the acceptance criteria for current and planned storage or disposal facilities;
- Managing the requirements for waste inventory data and forecasting reporting; and
- Maintaining cross-functional knowledge spanning the various specialty areas associated with CNL's Waste Management Program (including radiological, mixed, hazardous, and clean waste; waste storage and/or disposal options and facilities; waste minimization and reduction practices; and international practices with regards to the long-term management of waste).

The Waste Management Program ensures that all waste generated or received at CNL-operated sites not only meets waste management requirements but is managed in a safe and environmentally responsible manner in accordance with CNL's Occupational Safety and Health Policy and Environment Policy.

The Waste Management Program mandate applies to the full life cycle of waste from the point of generation to its final disposition. This includes all operations and activities that result from the planning, generation, transportation, processing, storage, and/or disposal of waste generated by CNL-managed sites or received by CNL-managed sites from external organizations. The waste hierarchy (Figure 30) is applied throughout the waste management process. Effective use of diversion (e.g., recycle and re-use routes), currently supplied by off-site service providers, requires options analysis, inventory recording, and characterization. Specifically, the prevention option is favoured to reduce the volume of waste sent off site. These diversion methods are incorporated in the waste planning and verified through site surveillance activities. For example, efforts are made to isolate clean materials from contaminated materials / waste materials. The Waste Management Program adheres to CNL's

Environment Policy, which states that waste should be dealt with at the highest practicable level in the hierarchy.

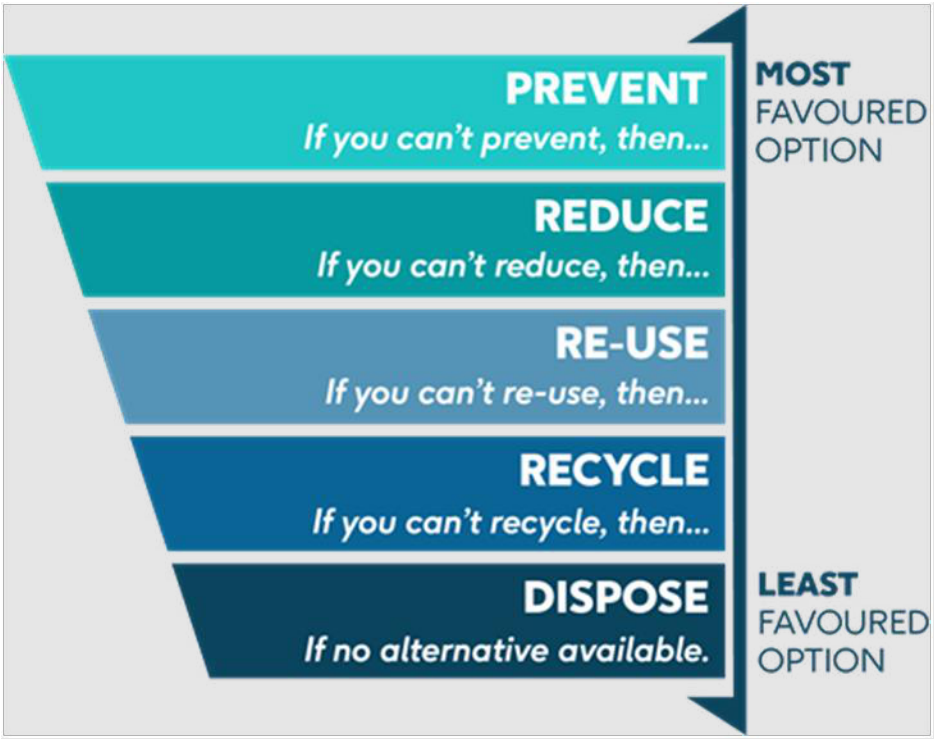


Figure 30: The waste hierarchy.

5.11.1.1 Past Performance

Radioactive, clearable, and hazardous wastes were generated from both ongoing operational activities and decommissioning projects. Whiteshell Laboratories has re-used or recycled as much material as practicable, consistent with the *CNL Integrated Waste Strategy* [45]; this includes both recyclable materials sent to the municipal recycling facility and other material-specific facilities throughout Manitoba.

The decommissioning projects included:

- Decommissioning on the south and north areas of the WL main campus began, which involved asbestos abatement and remediation of high temperature water lines and water utility holes;
- Decommissioning and demolition of Building 200 (ALWTC);
- Demolition of Buildings 402 and 305;
- Ground remediation east of SMAGS in the WMA performed to enable the establishment of an outdoor storage pad, referred to as the Recoverable Surface Storage and Staging Area;
- Legacy clean waste, consisting of concrete, stored on the south side of the main campus, rubblized and segregated of metal rebar for re-use. Concrete contaminated with asbestos-containing material and metal was dispositioned off site;

- De-inventorying of legacy waste stored in the SMAGS facility;
- De-inventorying of legacy waste stored in the LLW Quonsets (Building 431, 432 and 433); and

De-inventorying of legacy waste stored in LLW Bunker 5 (Figure 31) is approximately 65% complete. Some wastes have been transported to CRL for storage and eventual disposal. Remaining wastes are undergoing additional qualification and inspection to ensure transportation and waste criteria compliance are met. The waste is safely stored in certified transportation packages awaiting shipment to CRL.

Figure 31: Preparations for retrieval of waste from low-level waste Bunker 5.

Decommissioning activities generated construction and demolition debris, consisting of clearable waste (concrete material was dispositioned to an off-site receiver for future re-use, metal was recycled), and asbestos-containing material and of polychlorinated biphenyl (PCB) contaminated materials were dispositioned to appropriate off-site waste receivers. A reflux boiler, comprising 65.8 cubic metres (m^3) of LLW, was shipped to an off-site vendor for processing due to its physical size not meeting the CRL waste acceptance criteria. Whiteshell Laboratories continues to utilize external vendors for selected waste requiring treatment. The amounts of hazardous waste collected and transferred off site for processing are summarized in Table 14.

Table 14: Summary of amounts of hazardous waste shipped off site.

Year	Volume, m³ (weight, kg)	
	Solid Hazardous Waste	Liquid Hazardous Waste
2020	0.0	0.0
2021	8.2 (4,859.5)	3.9 (2,948.0)
2022	14.2 (7,605.4)	6.0 (670.8)
2023	638.0 (454,490.0)	0.0
2024[a]	0.0	0.0
Total	660.4 (466,954.9)	9.9 (3,618.8)

a No waste transported as of 2024 May.

The packaged solid radioactive wastes were stored in designated storage facilities in the WL WMA depending on the hazard level and packaging, as well as being dispositioned to CRL for interim storage.

Low-level liquid waste is processed in the Building 300 Low-Level Liquid Waste Treatment System and in the Building 100 Low-Level Liquid Waste Treatment System. The volumes of 106.9 m³ in 2020, 88.8 m³ in 2021, 119.6 m³ in 2022, and 56.4 m³ in 2023 of low-level liquid waste were processed through the two systems.

Overall, the radioactive waste generated over the current licence period has been safely dispositioned to CRL or safely stored in certified transportation packages awaiting shipment to CRL. The total volumes of radioactive waste transported to CRL for 2020 to 2024 are provided in Table 15.

Table 15: Radioactive wastes transported to Chalk River Laboratories for disposition.

Year	LLW, m³	ILW, m³
2020	527.7	26.3
2021	921.0	3.2
2022	341.6	2.52
2023	87.0	0.0
2024	0.0[a]	0.0[a]

a No waste transported as of 2024 May.

Other work included intrusive inspection of the concrete canisters. The inspection involved support from the IAEA and CRL resources. Completion of this activity supports planning efforts to safely retrieve the HLW intended for transport and storage at CRL.

Improvements were made in preventing waste accumulation inside of buildings and transferring the waste to appropriate waste facilities immediately after generation. Improvements continue to be addressed in reference to the lack of processing and storage

space for non-routine waste materials (e.g., mixed waste and large contaminated items), as well as large volumes of radioactive wastes generated from decommissioning activities. Mitigation measures in 2022 included putting into operation an area in the WMA for the interim storage of containers containing radioactive wastes. This area is referred to as the Recoverable Surface Storage and Staging Area, and consists of an outdoor, above ground storage pad to enable the storage and loading of solid LLW in ISO containers and storage of oversize LLW items which are awaiting further processing, characterization, and/or packaging to be considered compliant for off-site disposition. Additionally, a trans-shipment area was established north of the WMA. It was developed to reduce additional handling prior to shipment, and therefore improve efficiencies with off-site disposition of waste. The fenced area holds waste in locked ISO containers pending off site shipment. The containers host packaged waste that has been characterized and has the paperwork to allow shipment.

5.11.1.2 Future Plans

Canadian Nuclear Laboratories will continue to ensure that waste generated on site is managed safely and appropriately by implementing CNL company-wide waste practices and processes. Whiteshell Laboratories will continue to re-use or recycle as much material as practicable, consistent with the *CNL Integrated Waste Strategy* [45]; this includes both recyclable materials sent to the municipal recycling facility and other material-specific facilities throughout Manitoba. Waste Management Program representatives exercise a proactive approach to help ensure waste is properly segregated at the source of origin to maximize the amount of material that could be re-used or recycled.

The WL Site will utilize off-site processing services to safely disposition waste to the CRL Site. This is for newly generated wastes and the de-inventorying efforts of legacy waste stored in WL's legacy waste storage structures.

The Waste Management Program will continue to provide effective and efficient delivery of waste management services:

- Continue to refine and communicate the Integrated Waste Strategy to integrate waste life cycle management across all CNL-operated sites and to capture the CNL baseline waste strategies and defined pathways for all CNL wastes; and
- Strengthen collaboration between CRL and WL sites to effectively disposition radioactive wastes, leading to the advancement of remediation and transportation projects.

The remaining waste in the LLW Quonset huts will undergo additional qualification and inspection of waste contents to ensure transportation and waste criteria compliance criteria are met prior to shipment to CRL.

5.11.2 Decommissioning Plan

The Cleanup Function (formerly the Decommissioning and Demolition Function) provides consistent processes and procedures to enable all CNL sites and projects to establish and meet planned LUESs in order to address the decommissioning of buildings and environmental remediation of lands impacted by past, present, and future CNL operations. The function is

composed of three programs and specifies the requirements for land-use, decommissioning and demolition, and environmental remediation per the Cleanup Program. Whiteshell Laboratories adheres to CNL's Cleanup Functional Support Area and follows the requirements set out in the Cleanup Program.

During the licence period, there was a focused effort to revise the WR-1 Storage with Surveillance Plan, which was accepted by CNSC.

5.11.2.1 Past Performance

Class I Nuclear Facilities Regulations [13] require a proposed plan for decommissioning of the nuclear facility or of the site. Per the LCH [12], CNL submitted a revised WL Overview DDP in 2021 to the CNSC which was accepted, and the DDP was further revised in 2023 in alignment with REGDOC-2.11.2 [9], and submitted to the CNSC for acceptance (currently under review by the CNSC).

Whiteshell Laboratories is undergoing decommissioning according to decommissioning plans; these DDPs have been developed or are currently under development for separate facilities. Decommissioning activities cannot proceed without CNSC acceptance of the applicable DDP volume. The status (as of 2024 May) of the WL DDPs is shown in Table 16. Revisions to DDPs for SF (Volume 2) and Building 300 (Volume 9) were also completed and submitted to CNSC staff for review in 2024 March. Note that the DDP Volumes 3, 4, and 10 are for facilities that have already been decommissioned (i.e., Van de Graaff Accelerator, Neutron Generator, and Decontamination Centre) and are not shown in the table.

Table 16: Overview of Detailed Decommissioning Plans.

Facility	DDP Document Title	DDP Status
Program Overview	Volume 1 – Program Overview	DDP Volume is available for use (Revision 3 submitted to CNSC in 2023 for acceptance).
Shielded Facilities (SF)	Volume 2 – Shielded Facilities	DDP Volume is available for use (Revision 2 submitted to CNSC in 2024 for acceptance).
Active Liquid Waste Treatment Centre (ALWTC)	Volume 5 – Active Liquid Waste Treatment Centre Building 200	DDP Volume is available for use. End-state report is in development.
Whiteshell Reactor – 1 (WR-1)	Volume 6 – Whiteshell Reactor-1: Building 100	Complete Dismantlement and Removal Approach: DDP Volume is available for use.
		In Situ Decommissioning Approach: Environmental assessment process for in situ decommissioning is in progress.
Concrete Canister Storage Facility (CCSF)	Volume 7 – Concrete Canister Storage Facility	DDP was sent to the CNSC and comments received (to be dispositioned).

Facility	DDP Document Title	DDP Status
Waste Management Area (WMA)	Volume 8 – WMA Part 1: Standpipes Area	DDP is under development.
	Volume 8 – WMA Part 2: Intermediate-Level Waste Bunkers, Building 417 and Amine Tanks	DDP is under development.
	Volume 8 – WMA Part 3: Low-Level Waste Liabilities	DDP Volume is available for use.
Research and Development Facilities Complex	Volume 9 – Building 300	DDP Volume is available for use (Revision 1 submitted to CNSC in 2024 for acceptance).
	Volume 9 – Building 300_Addendum	
Health and Safety Facilities	Volume 11 – Building 402 and 305	DDP Volume is available for use. End-state report is in development.
DDP Volume 12	Volume 12 – WL Licensed Site Supporting and General Infrastructure: North-Side	DDP Volume is available for use.
	Volume 12 – WL Licensed Site Supporting and General Infrastructure –Part 1: South-Side Buildings	DDP Volume is available for use.
	Volume 12 – WL Licensed Site Supporting and General Infrastructure –Part 3: Outer Area Buildings and Facilities	DDP Volume is available for use.
	Volume 12 – WL Licensed Site Supporting and General Infrastructure –Part 4: Site Services	DDP Volume is available for use.
	Volume 12 – WL Licensed Site Supporting and General Infrastructure –Part 5: Site Affected Lands and Contaminated Structures	DDP Volume is available for use (revision planned for 2025).

A draft of a LUES Plan was released for public and Indigenous engagement. The details are presented in Section 4.1.7.

5.11.2.2 Future Plans

The current LCH [12] was last updated in 2023, and effective date for the REGDOC-2.11.2, *Waste Management Decommissioning* [9] and N294-19, *Decommissioning of facilities containing nuclear substances* [10] implementation is 2025 March 31.

Based on outcomes of public and Indigenous engagement, the LUES Plan will be updated. The final plan will define LUES categories for the WL lands and will provide a reference to the end-state clearance levels and cleanup criteria.

As facilities are decommissioned and demolished, and lands are remediated, end-state reports will be written and submitted to the CNSC. End-state reports are one of the tools that the regulatory authority uses to verify compliance with the licence authorizing the decommissioning and serve as input into any further licensing action. End-state reports include a summary of cleanup activities performed, including decommissioning and environmental remediation and deviations from the planning documents (e.g., DDP), references to decommissioning and remediation records, and survey results confirming that the planned end-state conditions have been met. If agreed upon end-state objectives have not been met, justification is provided within the end-state report.

5.12 Security

The CNL Security Program[1] implements CNL's Security Policy within CNL operating sites in Canada and ensures compliance with applicable legal and other requirements. The WL Security Branch fulfills WL's Security Program requirements (see Section 5.10).

5.12.1 Physical and Personnel Security

Physical Security Operations ensures site access and control to facilities is in accordance with the *Nuclear Security Regulations* [53] and is based on a graded approach, dependent on the sensitivity of the facility and corporate risk. Physical Security Operations protects nuclear material from theft and sabotage and responds to emergencies.

Personnel Security Services is responsible for safeguarding employees and CNL/AECL information, facilities, and assets by providing efficient security screening and investigative services. Personnel Security Services provides support to the programs and business processes in accordance with the needs of the organization, regulators, key stakeholders, the Treasury Board of Canada Secretariat Policy on Government Security and Standard on Security Screening, the Criminal Code of Canada, Provincial Statutes, Government of Canada Security Policy Regulations, CNSC regulations, and CNL policies, procedures, and directives.

5.12.1.1 Past Performance

Prior to the previous licence period in 2018, an order-in-council was issued to implement changes to CNL's security posture at the WL site. This order was closed on 2020 November 26, as WL completed all actions required to address the enforcement items listed in the Order, including the standing up of a Tiered Response Force, for which training has been completed.

A subsequent inspection was carried out by the CNSC on the Security SCA in 2021 September. The inspection focused on the verification of the implementation plan that included the establishment of a Tiered Response Force and other related security measures. Canadian Nuclear Safety Commission staff identified areas for improvement in WL's implementation of the Security Program. These areas did not pose any immediate risk to the security of nuclear substances at WL. A corrective action plan was implemented to address these areas.

[1] Note: Some details are not presented herein due to their being prescribed information.

Subsequent inspections were carried out by the CNSC in 2022 September and 2023 August and verified compliance.

5.12.1.2 Future Plans

An organizational change is occurring resulting from the 2023 Fire Protection Program non-compliances and subsequent safety stand-down, in which WL Emergency Services Operations, a combined fire and security services department, is separating fire and security resources, operations, and responsibilities. This will improve the overall quality and capabilities of the services and support provided by WL Fire and Security programs.

As a result of the 2023 self-assessment for WL security, recommendations were provided to upgrade specific areas within and around key facilities and to procure additional operational equipment. These planned upgrades are intended to further enhance security capabilities and support to future projects. These recommendations are captured within the CNL Problem Identification and Resolution Program.

5.12.2 Nuclear Cyber Security

The Information Technology Program provides capabilities to create, manage, and exchange electronic information, concentrating on supporting the capabilities of, and securing, the business network. After the declaration of non compliance and CNSC inspection of CNL's Nuclear Cyber Security program, CNL has a corrective action plan in place to become compliant with CSA N290.7-14, *Cyber-security for Nuclear Power Plants and Small Reactor Facilities* [54]. The Nuclear Cyber Security Program concentrates on protecting cyber assets which are under the scope of CSA N290.7, *Cyber-security for Nuclear Power Plants and Small Reactor Facilities* [54].

5.12.2.1 Past Performance

Nuclear cyber security is an area of focus under the Security SCA, and CNL is implementing corrective actions to address the deficiencies of the Nuclear Cyber Security Program, which applies to WL. Recent efforts have seen a set of mandatory cyber security training courses approved by the CNL Training Oversight Committee and rolled out to all employees in 2024. The courses are released gradually through the year and are intended to raise awareness on the types of threats employees may face, how to recognize them, and how to respond.

Weekly awareness campaigns (called social engineering) are conducted and target a random sub-set of employees or specific departments based on past results. By sending emails mimicking real threats, CNL measures an employee's ability to detect and respond to threats. Each employee is subject to a social engineering campaign at least once quarterly. In addition, a company-wide campaign is conducted at minimum twice a year.

Canadian Nuclear Laboratories performed a self-assessment of the Nuclear Cyber Security Program in 2023 and was engaged in a Type II Inspection of the Nuclear Cyber Security Program, conducted by the CNSC at CRL. The inspection resulted in 13 notices of non-compliance (three are closed to date). The findings are on the company-wide program, and

therefore applicable to WL. Cyber Assets under the scope of CSA N290.7 [54] have been identified and reviewed to determine the gaps in applicable controls. A remediation plan is in development to implement the mandatory controls, as well as additional controls deemed prudent to increase the protection of Cyber Essential Assets at WL.

5.12.2.2 Future Plans

An action plan has been developed and is in place to remedy the deficiencies identified during the Type II Inspection and through the self-assessment. Canadian Nuclear Laboratories is also making additional improvements to the program to prevent the reoccurrence of non-compliance and rapidly mature the company-wide program.

A graded approach will be developed to increase the oversight over operational technologies, the term used to describe cyber assets embedded in engineering systems.

Raising employee awareness of cyber threats is an ongoing necessity and needs constant adjustment to stay current. Awareness campaigns will evolve to communicate to employees the newest threats and provide tips on detecting and deflecting these threats.

5.13 Safeguards and Non-proliferation

The Nuclear Materials and Safeguards Management Program applies to all nuclear material and safeguards management activities performed at CNL facilities, including WL. It covers procurement, receipt, transfer, accountancy, safeguards management, storage, and inventory management of nuclear material. The primary focus of the Nuclear Materials and Safeguards Management Program is on facilities that contain fissionable material and are therefore subject to regulatory safeguards measures and reporting requirements.

5.13.1 Nuclear Materials and Safeguards Management Program

The Nuclear Materials and Safeguards Management Program continues to meet CNSC requirements as defined in CNSC REGDOC-2.13.1: *Safeguards and Nuclear Material Accountancy* [56] and ensures that all IAEA activities are fully supported.

5.13.2 Past Performance

The IAEA conducted several types of activities as part of the safeguards approach for CNL, including, but not limited to, IAEA safeguards seals changes, human surveillance, implementation and/or maintenance of IAEA safeguards monitoring equipment, and technical visits. A list of IAEA inspections conducted at all CNL sites can be found in Section 5.1.2. All actions resulting from IAEA oversight have been implemented.

- 2020 – No actions resulted from IAEA oversight;
- 2021 – Canister seal replacement was overseen and fissionable material sampled;
- 2022 – Two actions were raised based on inspections and have since been completed;
- 2023 – One action was raised to update the DIQ to include the robotic equipment and removal process for bunkers and standpipe decommissioning; and

- 2024 – Awaiting report from IAEA.

5.13.3 Future Plans

Canadian Nuclear Laboratories will continue to comply with the regulations and Licence conditions. The IAEA will be supported in its efforts to provide oversight of CNL's Nuclear Materials and Safeguards Management Program.

5.14 Packaging and Transport

The CNL Transportation of Dangerous Goods Program applies to all activities involving the transportation of dangerous goods performed by CNL across all managed sites. Transportation encompasses all operations associated with the movement of dangerous goods, including classification, documentation, packaging, safety marks, security, emergency response, training, and regulatory permits and licences.

The main objective of the Transportation of Dangerous Goods Program is to protect persons, property, and the environment from the effects of radioactive and hazardous material during transport by establishing and maintaining requirements and processes necessary to facilitate the safe transport of dangerous goods to and from CNL sites in accordance with regulatory requirements (Figure 32).

Figure 32: Shipment of waste preparing to leave the Whiteshell Laboratories Site.

5.14.1 Transportation of Dangerous Goods Program

Canadian Nuclear Laboratories' Transportation of Dangerous Goods Program implements and ensures compliance with the requirements in the following:

- *Transportation of Dangerous Goods Regulations*, SOR/2001-286 [57];
- *Packaging and Transport of Nuclear Substances Regulations* [58];
- IAEA SSR-6, *Regulations for the Safe Transport of Radioactive Material* [59]; and
- *Nuclear Security Regulations* SOR/2000-209 [53].

Transportation has been demonstrated to be safe. Atomic Energy of Canada Limited, and now CNL, has been transporting wastes safely and without incident for over 50 years. This activity consolidates AECL and CNL's radioactive wastes at the CRL Site according to the plans for the WLRP. Canadian Nuclear Laboratories regularly engages with the public to explain measures in place to ensure public safety and security, status of work underway to consolidate wastes at the WL and CRL sites, and how this work reduces Canada's nuclear liability and long-term risk.

5.14.2 Past Performance

During the period of 2020 to 2023, there have been multiple radioactive consignments of both solid LLW and solid ILW from the WL Site. All radioactive waste has successfully been transferred to CRL and other licensed waste receivers for disposition. All consignments were made safely during the licence period. Table 17 presents the off-site shipping data for the licence period; all shipments were directed to and received by CRL.

Table 17: Whiteshell Laboratories transportation of dangerous goods shipping totals for the licence period.

Year	Packages	Loads	LLW (m^3)	ILW (m^3)
2020	230	36	528	26
2021	68	53	921	3
2022	43	28	342	3
2023	6	3	87	0
2024[a]	0	0	0	0
Total	347	92	1,878	32

a No waste transported as of 2024 June.

One reportable event occurred during the licence period in 2021. This event consisted of a consignment of waste material that was misclassified in accordance with the *Packaging and Transport of Nuclear Substances Regulations* [58] and IAEA *Regulations for the Safe Transport of Radioactive Material* [59]. The event occurred because there was an incomplete inventory of the package's contents. This did not result in any impact to the any individuals or the environment.

Subsequently, extensive training was conducted with personnel responsible for the handling and packaging of radioactive waste materials, which included Class 7 RAM Material – Handler Training, as well as Waste Management and Packaging Fundamental Training, which was developed to capture the compliance requirements for processing, loading, and handling waste materials into certified transport packages, as well as the waste receivers' waste acceptance criteria.

5.14.3 Future Plans

In the future, the program will enable the safe removal from site of dangerous goods in support of the WLRP. It is expected that the dangerous goods will be LLW, with small quantities of ILW and even smaller quantities of HLW. The ILW and HLW will be shipped in Type B casks. In addition, there will also be small quantities of non-radioactive dangerous goods transported from the site.

Fuel shipments will also take place for the retrieval of the natural uranium fuel baskets from the CCSF (fuel baskets that were originally transferred to WL from the Douglas Point Nuclear Generating Station) discussed in Section 5.4.1.1. The fuel will be shipped to CRL for storage, as previously communicated via licence hearings and consistent with the *CNL Integrated Waste Strategy* [45].

6. Other Matters of Regulatory Interest

6.1 Cost Recovery

Whiteshell Laboratories is in good standing with respect to the provision of CNSC licensing fees and will continue to provide all necessary fees as and when required.

6.2 Financial Guarantees

Canadian Nuclear Laboratories understands the requirement for an acceptable financial guarantee. While ownership of CNL has transferred to the contractor Canadian National Energy Alliance, AECL retains ownership of the lands, assets, and liabilities associated with CNL's licences. These liabilities were officially recognized by the Minister of Natural Resources in a letter dated 2015 July 31 [60], per the WL Licence Condition G.3 (Financial Guarantee), and re-affirmed in 2020 [61].

6.3 Nuclear Liability Insurance

Under the *Nuclear Liability and Compensation Act* [62], the limit of insurance required for the CRL Site is $180 million. For CNL sites, there is a separate indemnity agreement with the Government of Canada to cover the difference between the established insurance limit and the $1 billion total liability limit.

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8. Glossary

8.1 Acronyms and Initialisms

Acronym	Definition
AECL	Atomic Energy of Canada Limited
ALARA	As Low As Reasonably Achievable
ALWTC	Active Liquid Waste Treatment Centre
AOPFN	Algonquins of Pikwàkanagàn First Nation
CA	Complementary Access
CANDU	CANada Deuterium Uranium
CCSF	Concrete Canister Storage Facility
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CRL	Chalk River Laboratories
CSA	Canadian Standards Association
DDP	Detailed Decommissioning Plan

Acronym	Definition
DIQ	Design Information Questionnaire
DIV	Design Information Verification
EAFP	Environmental Assessment Follow-Up Program
EIS	Environmental Impact Statement
HCF	Hot Cell Facility
HEPA	High Efficiency Particulate Air
HLW	High-Level Waste
IAEA	International Atomic Energy Agency
IFTF	Immobilized Fuel Test Facility
ILW	Intermediate-Level Waste
ISO	International Standard Organization
LCH	Licence Conditions Handbook for Whiteshell Laboratories
LLW	Low-Level Waste
LTRA	Long-Term Relationship Agreement
LUES	Land-Use and End-State
MMF	Manitoba Métis Federation
NCS	Nuclear Criticality Safety
NEW	Nuclear Energy Worker
NRTEDL	Nuclear Research and Test Establishment Decommissioning Licence
NSCA	Nuclear Safety Control Act
OSH	Occupational Safety and Health
PIP	Public Information Program
PIV	Physical Inventory Verification
REGDOC	CNSC Regulatory Document
RP	Radiation Protection
SCA	Safety and Control Area
SF	Shielded Facilities
SMAGS	Shielded Modular Above Ground Storage
WL	Whiteshell Laboratories
WLRP	Whiteshell Laboratories Restoration Project
WMA	Waste Management Area
WR-1	Whiteshell Reactor – 1

Appendix A Whiteshell Organization Chart