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A Licence Renewal

Renouvellement d'un permis

**Canadian Nuclear
Laboratories Ltd.**

**Laboratoires Nucléaires
Canadiens Ltée**

Whiteshell Laboratories

**Laboratoires de
Whiteshell**

Commission Public Hearing

Audience publique de la Commission

Scheduled for:
October 23-24, 2024

Prévue pour :
Le 23-24 octobre 2024

Submitted by:
CNSC Staff

Soumis par :
Le personnel de la CCSN

Summary

This CMD presents information about the following matters of regulatory interest with respect to Canadian Nuclear Laboratories (CNL):

- CNL's renewal application for the Nuclear Research and Test Establishment Decommissioning Licence for Whiteshell Laboratories.

CNSC staff recommend the Commission consider taking the following actions:

- Renew the Whiteshell Laboratories licence from January 1, 2025 to December 31, 2027 with an additional licence condition under the "management system" safety and control area to apply increased regulatory scrutiny.
- Delegate authority as set out in subsection 5.5 of this CMD.

The following items are attached:

- The proposed licence, NRTEDL-W5-8.00/2027
- The draft Licence Conditions Handbook
- The current licence, NRTEDL-W5-8.00/2024
- The Environmental Protection Review report

Résumé

Le présent CMD fournit de l'information sur les questions d'ordre réglementaire suivantes concernant les Laboratoires Nucléaires Canadiens (LNC):

- La demande de Laboratoires Nucléaires Canadiens visant à renouveler le permis de déclassement de l'établissement de recherche et d'essais nucléaires pour les Laboratoires de Whiteshell.

La Commission pourrait considérer prendre les mesures suivantes :

- Renouveler le permis pour les Laboratoires de Whiteshell du 1^{er} janvier 2025 au 31 décembre 2027 avec une condition de licence supplémentaire en vertu du SCA Système de gestion pour appliquer un examen réglementaire accru.
- Le cas échéant, utiliser le texte suivant : Déléguer les pouvoirs tel qu'il est établi à la sous-section 5.5 du présent CMD.

Les pièces suivantes sont jointes :

- Le permis proposé, NRTEDL-W5-8.00/2027
- L'ébauche du Manuel des conditions de permis
- Le permis actuel, NRTEDL-W5-8.00/2024
- Le Rapport d'examen de la protection de l'environnement

Signed/signé le

18 July 2024

Luc Sigouin

Director General

Directorate of Nuclear Cycle and Facilities Regulation

Directeur général de la

Direction de la réglementation du cycle et des installations nucléaires

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Plain Language Summary

The Canadian Nuclear Safety Commission (CNSC) acknowledges that Canadian Nuclear Laboratories Ltd. Whiteshell Laboratories (CNL-WL) is in the homeland of the Red River Métis, Treaty 1 and Treaty 3 territories and the traditional territory of the Anishinaabe and Ojibway Peoples. The Whiteshell Laboratories (WL) site is also located in the vicinity of Treaty 5 territory.

CNL holds the Nuclear Research and Test Establishment Decommissioning Licence NRTEDL-W5-8.00/2024 for WL, encompassing both nuclear and non-nuclear facilities. Located near Pinawa, Manitoba, WL covers 4375 hectares and houses various facilities, including the Whiteshell Reactor (WR-1). The site was formerly operated by Atomic Energy of Canada Limited and CNL became the licensee in 2015.

Since the initial decommissioning licence was issued in 2022, there has been significant progress in decommissioning activities, including building demolitions and below ground investigations into the conditions of various structures inside the WL Waste Management Area. The ongoing decommissioning activities have resulted in the reduction of risk at the site and continual improvements to health, safety and security of people and the environment.

CNL applied for a 3-year licence renewal on November 21, 2023, proposing to continue current activities without changes.

CNL did not request a licence amendment related to the WR-1 reactor *in-situ* (leaving in place) Decommissioning (ISD) approach in its licence renewal application. ISD of WR-1 is currently undergoing an environmental assessment under the *Canadian Environmental Assessment Act*, 2012. This will be presented to the Commission at a separate public hearing. Therefore, ISD of WR-1 reactor is out of the scope of this licence consideration, and the matter before the Commission in this CMD does not include ISD of the WR-1 reactor.

The purpose of this Commission Member Document (CMD) is to provide the Commission with CNSC staff's assessment of CNL's compliance with the regulatory requirements, conclusions and recommendations to support the Commission's determination on CNL's request to renew its decommissioning licence for the WL site. CNSC staff reviewed CNL's performance and took into consideration the results of CNSC staff's compliance verification activities, CNL's operational performance history and information submitted by CNL in support of the licence renewal application.

CNSC staff recommend that the Commission renew the proposed licence NRTEDL-W5-8.00/2027 for a 3-year period, which would remain valid from January 1, 2025, until December 31, 2027, with an additional licence condition to apply increased regulatory scrutiny. This recommendation is a result of the 2023 WL site shutdown for fire safety reasons.

Part 2 of this CMD provides licensing-related documentation about this hearing, including proposed licence changes, the proposed licence and the current licence. A draft licence conditions handbook is also included for information purposes only.

CMD STRUCTURE

This Commission Member Document (CMD) is presented in 2 parts.

Part 1 of this CMD includes:

1. an overview of the matter being presented;
2. overall conclusions and overall recommendations;
3. general discussion pertaining to the safety and control areas (SCAs) that are relevant to this submission;
4. discussion about other matters of regulatory interest; and
5. appendices material that complements items 1 through 4.

Part 2 of this CMD provides licensing-related documentation and includes:

1. proposed licence changes;
2. proposed licence and the current licence; and
3. a draft licence conditions handbook

1. Overview

1.1 Background

CNL is authorized to decommission the WL, comprising both nuclear and non-nuclear facilities under a CNSC-issued Nuclear Research and Test Establishment Decommissioning Licence NRTEDL-W5-8.00/2024 [1].

The WL site is located approximately 100 km northeast of Winnipeg near the town of Pinawa, Manitoba. Figure 1 illustrates the WL site location relative to surrounding communities. The WL site encompasses an area of 4,375 hectares and includes facilities such as the Whiteshell Reactor (WR-1), the shielded facilities, the radioactive waste management facilities and structures, the concrete canister storage area and various research laboratories and support buildings. The WL site was operated by AECL as a nuclear research facility for approximately 40 years. During this time WR-1 operated for 20 years under an operating licence issued by the Atomic Energy Control Board. In 2002 AECL applied for and was granted a decommissioning licence by the Commission. In October 2014, the Commission approved the transfer of the licence from AECL to CNL with the licence transfer completed in 2015. CNL remains the current licensee.

Figure 1: Location of Whiteshell Laboratories (source Google)



The CNSC defines decommissioning as the administrative and technical actions taken to allow the removal of some or all the regulatory controls from a facility, location or site where nuclear substances are managed, used, possessed or stored. Since 2002, significant decommissioning progress has been made by CNL with activities including:

- demolition of redundant buildings;
- phased decommissioning of the main research building;
- severing or redirecting services where necessary;
- construction of new enabling facilities;

- repurposing of buildings to support decommissioning; and
- initiating subsurface investigations into the conditions of various containment structures inside the waste management area.

As of 2023, notable facility demolition and decommissioning activities completed by CNL include:

- Van de Graaff Accelerator and Neutron Generator facilities
- Active Liquid Waste Treatment Centre
- Decontamination Centre,
- Health and Safety Facilities
- RD-14M and Large-Scale Vented Combustion Test Facilities
- Waste Management Area Incinerator and associated facilities.

An aerial view the WL main campus and Waste Management Area can be seen in Figure 2 and Figure 3 respectively.

Figure 2: Whiteshell Laboratories main campus (Source: CNL)



Figure 3: Whiteshell Laboratories Waste Management Area (Source: CNL)



Licensing History

The WL decommissioning licence was first issued by the Commission in November 2002 for a 6-year period. This was followed by the Commission renewing the licence in December 2008 for a 10-year period. Licence amendments were approved by the Commission in 2010 and 2012 to reflect requested changes in annual safety and environmental report submission dates, reference documents and action levels.

In October 2014, the Commission approved the transfer of all AECL licences, including the Whiteshell licence, to CNL under a Government-Owned-Contractor-Operated (GoCo) contract model. Under a GoCo contract model, CNL is responsible for managing and operating AECL owned sites. Canadian National Energy Alliance is the owner of CNL (Operator) and the contractor of AECL that is either renewed or replaced through a competitive procurement process. The licence transfer was completed by September 2015 with CNL becoming the licensee. In January 2016, the Commission approved an administrative licence amendment that revised the licence to the standardized format with an associated licence conditions handbook (LCH).

In September 2017, CNL applied to renew the WL decommissioning licence for a 10-year period. With this application, CNL submitted a proposal for the in-situ decommissioning (ISD) of the WR-1 reactor. CNL's proposal to conduct ISD of the WR-1 reactor was a change from the original decommissioning approach of dismantlement and triggered the requirement for an environmental assessment (EA) under the Canadian Environmental Assessment Act (CEAA), 2012 [2].

As part of the CEAA 2012 process, a draft environmental impact statement (EIS) for the proposed ISD of the WR-1 reactor was submitted by CNL and made available to the public for comment. CNL determined that additional time was needed to address the large number of comments raised by the public, Indigenous Nations and communities and regulators concerning the draft EIS that was developed in support of the EA. Note that this EA, and the associated licensing request for the ISD of WR-1, are not part of the current licence application.

Consequently, in March 2018, the WL licence was renewed by the Commission for a 1-year period until December 2019 with no changes to the terms, conditions, or licensed activities.

CNL's 2019 Licence Renewal Application

On November 15, 2018, CNL requested a 10-year renewal of the WL licence to continue ongoing decommissioning activities and provide sufficient time to complete the safety case for the in-situ decommissioning (ISD) of the WR-1 reactor. Therefore, CNL's licence renewal application before the Commission did not include ISD of WR-1 and was not in the scope of the 2019 licence renewal consideration.

The existing decommissioning licence included a decommissioning strategy for the WL site that was previously accepted by the Commission in 2002, which does not authorize the ISD of WR-1. CNL must seek separate Commission authorization for the newly proposed decommissioning strategy for the ISD of the WR-1.

Although CNL requested a 10-year licence renewal, the Commission renewed the WL licence for a period of 5 years. The Commission determined that a period of 5 years was more appropriate considering the important activities to be carried out at the WL site in the upcoming years and the concerns raised by intervenors.

Current Licence Renewal Application

CNL's current decommissioning licence NRTEDL-W5-8.00/2024 [1] remains valid until December 31, 2024. On November 21, 2023, CNL applied for a 3-year renewal of their decommissioning licence for WL. In its application, CNL proposes to continue to conduct the licensed activities as outlined in the current WL licence throughout the proposed 3-year period of the renewed licence. There are no requests to change the terms, conditions, or licensed activities from the current WL decommissioning licence.

CNL proposed a 3-year renewal period taking into consideration:

- The timeline for completing key licensing items for planned future site activities.
- Rebuilding the trust of the public, Indigenous Nations and communities and the CNSC after several site safety stand-downs during the previous licence period, including the 2023 WL safety stand-down following the discovery of non-compliances in the fire protection program.
- An upcoming new GoCo contract in September 2025.

The licence renewal application does not include a licence amendment request related to the ISD of the WR-1 reactor. CNL will submit a separate licence amendment application related to the WR-1 ISD when appropriate.

Reporting on Licensee Performance

CNSC staff conduct ongoing regulatory oversight and compliance verification activities at the WL site. Regular updates on licensee performance and project status have been and will continue to be brought to the Commission's attention via regulatory oversight reports (RORs) at public meetings. In the past, CNSC staff provided interim reporting where the Commission was kept up to date and informed of the status of decommissioning activities in 2012 (interim status report) [3], 2014 (annual performance report) [4], 2016 (status report) [5], and in 2018 (progress update) [6].

This CMD builds on the information provided in the attached appendices. The Commission will be provided an update on the status of CNL's performance at the WL site in the CNL Sites 2023 ROR to be presented at a public meeting. This ROR will discuss CNL's performance at all its licensed facilities from January 1, 2023 to December 31, 2023.

1.2 Highlights

Licence Renewal Application from CNL for Whiteshell Laboratories

On November 21, 2023, CNL applied for a renewal of their Nuclear Research and Test Establishment Decommissioning Licence for WL. In its application, CNL requests a 3-year licence renewal, and provides information on a clause-by-clause basis for relevant excerpts from the [Nuclear Safety and Control Act](#) (NSCA) and relevant CNSC Regulations. CNL also describes how it meets these requirements as per the compliance verification criteria prescribed by CNSC in the current WL licence conditions handbook (LCH).

CNL intends to continue to conduct the licensed activities as outlined in the current WL licence throughout the proposed period of the renewed licence. There are no requests to change the current licenced activities within the licence renewal application.

The current WL decommissioning licence authorizes CNL to:

- a) operate and decommission the WL located in Pinawa, Province of Manitoba as further described in the WL LCH,
- b) produce, possess, process, refine, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),
- c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
- d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a),

- e) carry out the site preparation, construction or construction modification or undertaking that is required for, associated with or arise from the activities described in a).

Of note, the licence renewal application states that it does not include a licence amendment request related to the ISD of the Whiteshell Reactor #1 (WR-1) and CNL will submit a separate licence amendment application related to the WR-1 ISD when appropriate.

CNSC Staff Assessment of CNL's Licence Renewal Application for Whiteshell Laboratories

CNSC staff's assessment of CNL's application for renewing the WL site licence, takes into consideration the results of CNSC staff's compliance verification activities, CNL's operational performance history and information submitted by CNL in support of the application.

In its application, CNL applied for a 3-year licence renewal proposing to continue to conduct the currently authorized licensed activities throughout the proposed 3-year period of the renewed licence. There are no requests to change the terms, conditions, or licensed activities from the current WL decommissioning licence.

As mentioned in subsection 1.1, CNL proposed a 3-year renewal period taking into consideration its timeline for completing key licensing items, the upcoming new GoCo contract in September 2025 and rebuilding the trust of the public, Indigenous Nations and communities and the CNSC.

CNSC staff recommend a 3-year licence renewal period with an additional licence condition under the Management System SCA. This recommendation is a result of the WL fire protection program deficiencies event and site stand-down. The additional licence condition contributes to CNSC staff's increased regulatory scrutiny and oversight of the WL site and is further discussed in subsection 4.1.3.3.

This licence condition requires CNL to submit reports covering the progress of the planned assessment activities, including internal and external audits, inspections, benchmarking, and program reviews, and provides a 3-year rolling plan for all assessment activities. It also requires CNL to submit details on the purpose and scope of all planned assessments and detailed results of corrective actions, planned effectiveness reviews and status updates on previous corrective actions and the results of effectiveness reviews.

CNSC staff consider a 3-year licence period is an appropriate amount of time for CNL to implement corrective actions and improvements to all SCA programs at the WL site to meet or maintain sustainable satisfactory performance ratings.

CNSC staff have prepared a proposed licence that uses the standard format and incorporates the standard licence conditions and an additional site-specific licence condition under the Management System SCA applicable to the WL site.

This CMD provides a summary of CNSC staff's review of all 14 SCAs.

1.3 Overall Conclusions

CNSC staff have reviewed CNL's licence renewal application and supporting documents and CNSC staff's assessment determined that the application complies with the regulatory requirements.

CNSC staff concluded that CNL's performance during the licensing period was satisfactory. However, a downward trend in performance was assessed in 2 Safety and Control Areas (SCA), particularly in the Human Performance Management (HPM) and Emergency Management and Fire Protection (EMFP). As a result of the safety stand-down at WL following the discovery of non-compliances in its fire protection program (further discussed in section 2), CNL has reduced operations at WL to be limited to essential tasks and are implementing corrective actions for the WL site to ensure a safe return to normal operations. CNSC staff recommend an additional licence condition to improve performance for both SCAs. On top of this additional licence condition, CNSC staff increased regulatory oversight under a WL-specific compliance verification plan. CNSC staff will increase regulatory oversight and compliance verification activities under a focused WL-specific compliance plan to ensure regulatory requirements are met.

1.4 Overall Recommendations

CNSC staff recommend the following:

1. Conclude, pursuant to paragraphs 24(4)(a) and (b) of the [*Nuclear Safety and Control Act*](#) (NSCA) in that CNL:
 - a. Is qualified to carry on the activities authorized by the licence.
 - b. Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
2. Renew the proposed 3-year NRETDL licence to authorize CNL to continue its authorized activities at the WL from January 1, 2025, to December 31, 2027.
3. Approve the proposed licence condition changes including an additional licence condition 1.2 under the Management System safety and control area outlined in Part 2 of this CMD.
4. Delegate authority as set out in subsection 5.5 of this CMD.

2. WL Site Safety Stand-Down

2.1 2020 Site Safety Stand-Down (COVID-19)

CNL implemented a safety stand-down at WL from November 16, 2020, to February 8, 2021, due to an increase in COVID-19 risk and an unrelated adverse trend in human performance field work activities. CNL took corrective actions to provide specialized training to employees related to human performance fundamentals, safety culture, safe work practices, and work processes and procedures. CNL also addressed gaps in its human performance program to ensure a safer work environment which CNSC staff reviewed and found to be satisfactory.

2.2 2022 Site Safety Stand-Down (Safe Work Practices)

In May 2022, WL experienced an event where a worker received an electrical shock while performing maintenance activities on a pump. The worker was assessed by First Aid Responders and deemed the worker fit to return to normal duties with no further medical attention needed. It was determined the pump motor was not isolated via lock-out tag-out procedures to remove the hazard to workers. As a result of this incident, WL Senior Leadership immediately initiated a safety stand-down of all hazardous energy control work.

CNL determined that the contributing causes included work screening procedural mistakes, resource shortages, unclear instructions and ineffective changes to engineering and training procedures. CNL management also failed to reinforce procedural adherence, maintain consistent training and address hiring challenges with unrealistic resource expectations. These contributing causes indicated a need for better adherence to procedures, resource management and training oversight.

CNL placed compensatory measures at WL which included approval from top managers for hazardous operations until recovery plan corrective actions are complete. This process ensured thorough planning, worker qualifications and documentation. CNL Managers placed emphasis on workers halting operations if they encounter hazards or unexpected changes.

Under a WL recovery plan, CNL undertook numerous corrective actions to address procedural adherence issues, resource management and training oversight by revising work planning guidelines, standardizing procedures, improving maintenance monitoring and evaluating its organization structure. Resumption of fieldwork resumed in December 2022 following the completion of the corrective actions in the WL recovery plan. CNSC staff verified the implementation of CNL's corrective actions during a reactive Human Performance Management SCA focused inspection in December 2023. The inspection revealed 4 NNCs related to outdated training documentation and requirements, inaccurate training records, limited access to training records by supervisors, and inconsistent training program evaluation. The results of the inspection are further discussed under Personnel Training in subsection 4.2.3.1 of this CMD.

2.3 2023 Site Safety Stand-Down (Fire Program Deficiencies)

Background

In April 2023, CNL conducted a self-assessment of its fire protection program at the WL site, finding deficiencies in training records for on-site fire brigade members and incomplete equipment procedures. Consequently, CNL reported the event to the CNSC, leading to a shutdown of non-essential activities. Further investigation revealed additional non-compliances with the fire protection program, such as inadequate training of firefighters, maintenance issues with equipment and problems with firewater supply and fixed suppression systems. These findings prompted regulatory actions, including technical meetings and a site visit by CNSC staff to ensure that CNL implemented immediate corrective measures effectively.

CNSC staff informed the Commission of the WL FPP deficiencies and site stand down of operational activities and CNSC staff regulatory oversight on June 28, 2023, via an Event Initial Report ([CMD 23-M25](#)).

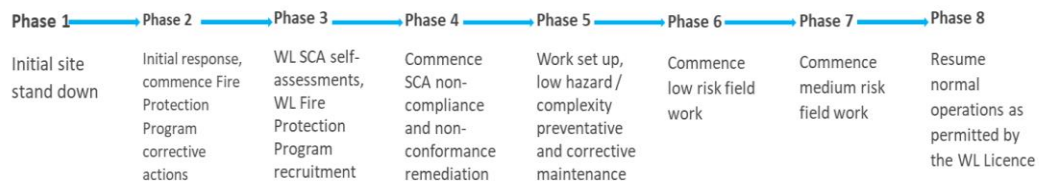
As previously reported in the June 28, 2023, Event Initial Report (CMD 23-M25), CNL planned to submit a site recovery plan to CNSC staff pending completion of its Root Cause Analysis. On July 13, 2023, CNL submitted a site multi-phase site restart plan.

The plan uses a risk-based assessment model to design and define 8 graduated phases of operation for the WL site towards full normal operations. The plan outlines the root cause analysis (RCA) actions and work that must be completed by both CNL staff as well as contractors before entering the next phase of operations. This plan sets out a safe, graduated return to normal site operations and defines the process to be used to restart safe operational activities.

CNL management meets to review and confirm that the required corrective actions and their implementation effectiveness reviews per phase are completed and to confirm their readiness for the WL site to progress to the next recovery plan phase. CNL submits phase readiness packages to CNSC staff for review and acceptance, prior to being allowed to move to the next phase of the recovery plan.

Figure 4 describes the activities to take place at each phase of the recovery plan.

Figure 4: CNL WL Graduated Phases for Restart (Source: CNL)



CNSC staff determined that the risk to the health or safety of persons or impact on the environment is low because of the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations.

CNL and CNSC staff actions since CNSC staff presented the June 28, 2023, Event Initial Report (CMD 23-M25) to the Commission are outlined below.

CNL Actions

On June 8, 2023, CNL submitted a letter committing to ensuring a minimum staffing level of 6 trained firefighters and 1 dispatcher for fire response during both day and night shifts. This commitment aimed to address concerns raised by the CNSC regarding the adequacy of the Minimum Shift Complement (MSC) for responding to internal and external fires, particularly during 'quiet hours.' CNL undertook a review to ensure compliance with the CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Radioactive Substances* [55] standard by June 16, 2023, focusing on the MSC, which was initially determined based on a 3rd party fire response needs analysis (FRNA). Despite the FRNA being submitted to CNSC staff as required per CSA N393-13, a licensing basis review performed by CNL revealed a lack of independent assessment by CNL regarding the MSC change and CNL relied on the information based on the FRNA. This led to CNL committing to maintaining the proposed complement round the clock from June 26, 2023. CNSC staff approved this commitment, acknowledging its sufficiency to meet CSA N393-13 requirements.

Additionally, in response to the request from CNSC staff, CNL committed to conducting a review of fire audits or assessments prepared since 2018, assessing how recommendations were addressed, and submitting the results to CNSC staff by June 16, 2023. CNL fulfilled this commitment by submitting its assessment. After performing a desktop review, CNSC staff confirmed that the submission met CNL's commitment, with no further comments on the matter.

CNL submitted 5 Fire Hazard Assessments (FHAs) on June 5, 2023, following licence condition 10.2 of the Nuclear Research and Test Establishment Decommissioning Licence for WL. The submission was made in response to a request during a meeting held at WL on May 30, 2023, as part of CNSC-CNL discussions regarding the WL safety stand-down due to fire protection program deficiencies.

Following a desktop review by CNSC staff, areas requiring clarification were identified. CNSC staff noted that 1 FHA dated back to January 27, 2020, and another to July 17, 2022. CNSC staff noted that these FHAs have not been received demonstrating that CNL has not consistently ensured that WL facility FHAs are reviewed within the 5-year cycle as mandated by CSA N393-13 and submitted to CNSC within 6 months post-review as per licence condition 10.2 of the Nuclear Research and Test Establishment Decommissioning Licence for WL. CNSC staff communicated the requirements to CNL along with comments. CNL responded to CNSC staff comments on December 6, 2023, that included clarifications and answers to the comments. CNSC staff reviewed CNL's submissions and determined that CNL's proposed actions were satisfactory.

As of CNL's submission of the plan on July 13, 2023, CNL completed the required corrective actions and effectiveness review for WL to be at Phase 4 of 8 phases of the Multi-Phase Recovery Plan. CNSC staff conducted reviews of CNL's phase readiness submission and provided acceptance.

On November 30, 2023, and February 1, 2024, CNSC staff reviewed and accepted CNL's submission of a readiness package for Phase 5 and Phase 6 of the WL multi-phase recovery plan respectively. CNSC staff will continue to review CNL's readiness packages for Phase 7 and Phase 8 once formally submitted. CNSC staff will provide an update to the Commission during the presentation of the CMD at the scheduled October 23-24, 2024, hearing.

CNSC Actions

As part of the CNSC Designated Officer [*General Nuclear Safety and Control Regulations*](#) (GNSCR) subsection 12(2) [request](#) issued to CNL on May 15, 2023, CNSC staff requested CNL to conduct a third-party review of the fire protection program as required by CSA N393-13 and submit the complete results of the review to the CNSC. CNSC staff further clarified in a telephone conversation to CNL that a third-party review of its fire response capabilities is what is being requested per the [GNSCR](#) subsection 12(2) action.

On August 30, 2023, CNL submitted the third-party review of the fire response capabilities at WL. CNSC staff reviewed the third-party review and determined that it met the commitment that CNL made in response to the GNSCR subsection 12(2) request. CNL reported 7 opportunities for improvement which CNSC staff determined to be acceptable. CNSC staff will follow up on the implementation of these opportunities for improvement as part of CNSC staff's WL-focused compliance verification plan for WL, that is further discussed in subsection 4.10.3.2.

CNSC staff observed additional findings through an EMFP reactive inspection conducted in August 2023. On August 21, 2023, CNL discovered that it lacked records of pre-employment medical assessments for 10 firefighters hired between July 17, 2023, and August 21, 2023, while preparing for a CNSC inspection.

On August 22, 2023, CNSC staff conducted the EMFP reactive inspection of WL. Subsequently, on August 23, 2023, as CNL prepared to submit all firefighter annual medical assessment records as requested by CNSC staff, it was discovered that 8 existing firefighters' annual medical assessments had lapsed during the months of July and August, in addition to the missing pre-employment medical assessment records for 10 newly hired firefighters.

CNL took immediate corrective actions including conducting and completing annual medical assessments for the outstanding firefighters. On November 17, 2023, CNSC staff issued the inspection report with 10 NNCs highlighting deficiencies in firefighter medical assessments, inappropriate storage of combustibles, incorrect colour-coding of a fire hydrant, improper maintenance and identification of fire separations, and out-of-date pre-fire plans at WL.

CNSC staff reviewed and accepted the closure of 3 NNCs after reviewing CNL's implemented corrective actions from this inspection and are currently reviewing submitted corrective actions for several other NNCs stemming from this inspection. CNSC staff continue to maintain regulatory oversight and progress of CNL's actions to address the open NNCs through increased regulatory meetings and under the WL-focused compliance verification plan.

Administrative Monetary Penalties (AMPs) are monetary penalties imposed by the CNSC to promote compliance with the NSCA and its regulations, without court involvement, for the violation of a regulatory requirement. They can be imposed to any individual or corporation subject to the [NSCA](#).

On October 13, 2023, a CNSC Designated Officer issued a notice of violation and imposed an [Administrative Monetary Penalty of \\$14,860](#) to CNL specifically for failing to comply with its Nuclear Research and Test Establishment Decommissioning Licence, NTREDL-W5-8.00/2024, condition 10.2 [1]. This licence condition states that: *"The licensee shall implement and maintain a fire protection program."*

The CNSC Designated Officer issued the AMP in response to CNSC staff's findings from the August 22, 2023, EMFP reactive inspection, taking into consideration CNL's compliance history and the licensee's negligence.

On October 24, 2023, CNSC conducted an inspection and fire response drill evaluation at WL in response to ongoing safety concerns related to a site safety stand-down. The purpose of this inspection was to assess the readiness of the WL on-site fire department's ability to respond to fire emergencies, which is crucial for implementing Phase 5 of CNL's proposed restart plan.

The implementation of Phase 5 involves returning CNL staff and contractors to site, beginning work on training and records compliance, planning work for the gradual return of complex field work and restarting low hazard and simple maintenance.

The inspection included a physical walk-down of the fire hall and Building 405, an inspection of fire apparatus, technical discussions with CNL staff, and an assessment of the fire response drill conducted in collaboration with the Pinawa Fire Department. Preliminary findings identified areas of non-compliance, leading to the issuance of 8 NNCs for CNL to address.

The NNCs pertained to maintaining first aid kits, tracking on-air times in hazardous areas, ensuring accountability and entry control during emergencies, conducting Personnel Accountability Reports (PARs), keeping fire separation doors closed, testing foam concentrate tanks annually, recording incident response communications, and providing Pinawa Fire Department access to site radio communications. CNSC staff considered the associated risk to health and safety of the public or impact on the environment as low. CNSC staff observed several aspects of the fire response drill that were executed effectively, such as meeting response time requirements, proper donning of fire equipment within acceptable timeframes, effective location and extraction of casualties, and achieving effective and sustained intervention on the fire during the drill.

CNSC staff also performed an inspection of a fire response drill at WL in April 2024. The final report for this inspection has not been issued at the time of writing this CMD. CNSC staff observed that CNL was compliant with the performance criteria requirements of CSA N393-13 for the observed fire response drill; however, improvements are required in the conduct and the frequency of fire response drills.

Overall, based on the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations, which requires CNSC staff acceptance, CNSC staff determined that the risk to the health or safety of persons or impact on the environment from the event as low. CNSC staff have established a focused compliance plan to verify that CNL's corrective actions to the WL FPP and HP programs are satisfactorily implemented.

CNSC staff's regulatory focus and proposed improvements regarding this event and the Emergency Management and Fire Protection SCA during the proposed 3-year licence period is further discussed in subsection 4.10.3.2.

3. Environmental Protection Review

CNSC staff reviewed the licence application to identify what type of environmental review was required to be conducted, if applicable. As part of this process, CNSC staff must assess whether an integrated impact assessment or a federal lands review under the [Impact Assessment Act](#) (IAA) is required. For this licence renewal application, neither are required because the renewal application does not include activities listed in the IAA or [Physical Activities Regulations](#) that require an impact assessment, or that meet the definition of a project on federal lands.

CNSC staff conduct environmental protection reviews (EPRs) for all licence applications with potential environmental interactions, under CNSC's mandate under section 9 of the [NSCA](#) and associated regulations. The EPR reports help inform the Commission's conclusion on whether the proposal provides adequate protection of the environment and the health of people.

CNSC staff prepared an EPR report for the WL site that summarizes the environmental performance of the site from 2016-2022. The report is appended to this CMD in Appendix F.

CNL submitted a required site-wide Environmental Risk Assessment (ERA) as per CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* [55] requirements in May 2023. CNSC and Environment and Climate Change Canada (ECCC) staff reviewed the site-wide ERA against CSA N288.6-12 requirements and provided comments to CNL. CNL will resubmit a revised site-wide ERA for CNSC staff acceptance prior to the licence renewal hearing and the EPR will be updated upon acceptance of the revised site-wide ERA. Further details on CNL WL's site-wide ERA can be found in subsection 4.9.4. CNSC staff's review of the submitted site-wide ERA has determined that there are no significant risks to the public or the environment and that the public and the environment continue to be protected.

CNSC staff's assessment included a review of the application and supporting documents, including the submitted environmental risk assessment, the detailed decommissioning plan, annual compliance monitoring reports, and past environmental performance for the facility.

CNSC staff will continue to verify and ensure that, through ongoing licensing and compliance activities and reviews, the environment and the health of persons are protected and will continue to be protected.

4. General Assessment of SCAs

CNSC staff review and assess an applicant's proposed measures and controls, and if applicable, a licensee's past performance in each SCA. CNSC staff may also choose to combine multiple SCAs to provide a more integrated picture of the licensee's performance over the licensing period.

Rating level categories for the SCAs are provided in Appendix A.

Of note, at the time of writing this CMD CNSC staff did not have all the required data to fully assess CNL's performance in the Environmental Protection SCA for 2023. The required reports from CNL to complete a full assessment are submitted later in the 2024 calendar year per the WL licence. However, CNSC staff have provided an initial performance rating based on 2023 data obtained and is presented in the Environmental Protection SCA section. An update with CNSC staff's confirmation and final assessment of CNL's performance in this SCA will be provided during the presentation of the CMD in October 2024, once CNL staff have completed a review of the submitted CNL reports. CNSC staff will also provide a final assessment of WL's performance in the 2023 calendar year as part of the 2024 CNL Regulatory Oversight Report.

Note: All CMDs related to the decommissioning of facilities include CNSC's staff assessment of **all** 14 SCAs.

The specific areas that comprise the SCAs for the licensed activities are identified in Appendix C, section C.1.

4.1 Management System

The Management System SCA covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.

The specific areas that comprise this SCA at the WL site include:

- Management system
- Organization
- Performance assessment, improvement and management review
- Operating experience (OPEX) – (no significant observations to report)
- Change management – (no significant observations to report)
- Configuration management – (no significant observations to report)
- Records management – (no significant observations to report)
- Management of contractors – (no significant observations to report)

4.1.1 Trends

The following table indicates the overall rating trends for the Management System SCA over the current licensing period:

TRENDS FOR MANAGEMENT SYSTEM:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL has maintained a management system in accordance with CNSC requirements over this licensing period. CNL continues to be rated SA in this SCA at WL.</p>				

4.1.2 Discussion

The [*Class I Nuclear Facilities Regulations*](#) require that an application for a licence shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.

The [*General Nuclear Safety and Control Regulations*](#) require that a licence application contain the applicant's organizational management structure, including the internal allocation of functions, responsibilities and authority.

To meet CNSC requirements for this specific area, the licensee must implement and maintain the management system requirements set out in Canada Standards Association (CSA) standard N286-12, *Management system requirements for nuclear facilities* [46]. The management system brings together, in a planned and integrated manner, the processes necessary to satisfy the requirements that must be met to safely carry out the licensed activity. During the current licensing period, CNL has implemented and maintained a management system at the WL site.

CNSC staff performed desktop reviews and conducted compliance inspections of CNL's implementation of their management system program at the WL site and conclude that the program meets all applicable regulatory requirements and CNSC expectations. In each update to the management system manual and other process documents listed in the LCH, CNSC staff comments were resolved satisfactorily by CNL.

4.1.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.1.3.1 Past Performance

Management System

During the licensing period under review, CNL has provided CNSC staff with updates to their management system. Primarily, the management system is described by the CNL Management System Manual (900-514100-MAN-001) [7] supported by several topic-specific program documents. The most recent revision to CNL's management system manual (Revision 3.1) was reviewed in 2023. And CNSC staff determined that the management system manual met regulatory requirements.

CNL sites, such as WL, have developed Quality Assurance Plans to describe site-specific aspects of the CNL management system and the site-specific functions, responsibilities and authorities. Other changes described in the management system updates submitted included reorganizing the company document structure and format and changes in responsibilities. CNSC staff confirmed that the WL Decommissioning Quality Assurance Plan [8] incorporates all the requirements necessary to meet the CSA N286-12 [46] standard.

CNSC staff verify elements of CNL's management system during all inspections conducted on the site. This is done through CNSC staff review of CNL's records, verification of the licensee's implementation of document control, training program and general maintenance of the programs relevant to the safe and secure conduct of the licensed activities. During the current licence period, CNSC staff conducted 2 focused inspections of the Management System SCA. The first inspection was conducted in April 2021, where CNSC staff issued 6 notices of non-compliance (NNC). The NNCs were all related to the Control of Information, including Document Control and Records Control. CNSC staff determined that the NNCs did not pose a safety risk to the environment or people.

CNL initiated corrective action plans to address all the findings, and the actions taken were accepted by CNSC staff.

CNSC staff performed a second Management System SCA focused inspection in March 2024 and conducted a general inspection that included several SCAs in April 2024, including the Management System SCA. Although the final inspection reports for these inspections have not been issued at the time of writing this CMD, CNSC staff did not observe any safety significant findings.

CNSC staff determined that the WL management system continues to meet CNSC requirements.

Organization

CNL's organization is defined in several process and program documents, primarily the CNL Management System Manual (900-514100-MAN-001) [7] and the Functional Authorities List (900-514100-LST-001) [9]. CNL submitted the most recent versions of both documents to CNSC staff for review in 2023. During that review, CNSC staff confirmed that CNL has appropriately documented the changes to the CNL organization. CNSC staff have no concerns regarding the changes to the CNL organization and have confirmed CNL's organization is suitable to ensure continued safe operation and compliance with regulatory requirements.

Performance Assessment, Improvement and Management Review

CSA N286-12, *Management system requirements for nuclear facilities* requires that problems are identified, controlled, documented and resolved by the nuclear facility operator. CNL documents issues and opportunities for improvement through a problem identification and resolution mechanism referred to as "ImpAct".

WL performed a site safety stand-down in 2023 after CNL conducted a self-assessment of its fire protection program at the WL site. The self-assessment found deficiencies in training records for on-site fire brigade members and incomplete equipment maintenance.

Additional information related to the 2023 site safety stand-down can be found in section 2.3.

As part of compliance assessment activities, CNSC staff performed a compliance inspection focused on problem identification and corrective action in March 2024. The inspection report has not been issued at the time of writing this CMD, however, CNSC staff observed that CNL was compliant with CSA N286-12 [46] requirements including organizational, document control and records management. CNSC staff will be providing an update on this matter at the presentation of this CMD during a public hearing that is scheduled for October 23-24, 2024.

CNSC staff verify CNL improvement action (ImpAct) initiation, routing, trending, approval, and effectiveness by performing routine desktop reviews of ImpAct reports. Field verification of the completion of follow up actions, where appropriate, are integrated into site inspection activities. As a result of these reviews CNSC staff conclude that CNL continues to meet CNSC regulatory requirements in this area.

4.1.3.2 Regulatory Focus

CNSC staff will continue to monitor CNL's performance in this SCA through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation to ensure CNL continues to meet applicable regulatory documents, codes and standards for the upcoming proposed 3-year licence period.

4.1.3.3 Proposed Improvements

CNSC staff recommend an additional licence condition under the Management System SCA. This proposed licence condition, 1.2, requires CNL to submit reports covering the progress of the CNL's integrated assessment plan (IAP) at WL to the Commission or any person authorized by the Commission.

CNL's IAP outlines a list of planned assessment activities, including internal and external audits, program reviews and provides a 3-year rolling plan for all assessment activities. This licence condition not only requires CNL to submit details on the purpose and scope of all planned assessments but also requires detailed results of corrective actions, planned effectiveness reviews, and status updates on previous corrective actions and the results of effectiveness reviews.

This recommendation is a result of the WL fire protection program deficiencies event and site-stand-down discussed in section 2.3. The additional licence condition would also contribute to CNSC staff's increased regulatory scrutiny and oversight of the WL site with CNSC staff's WL specific compliance verification plan which is further discussed in the Emergency Management and Fire Protection SCA in subsection 4.10.3.2.

This licence condition aims to enact additional regulatory scrutiny to ensure that CNL is accountable for its performance and drives improvement for all 14 SCAs with increased regulatory scrutiny from CNSC staff. By implementing this licence condition, CNSC staff will have an additional avenue of insight into the licensee's assessments, areas in need of corrective action and be able to apply increased regulatory scrutiny in compliance oversight. Details and compliance verification criteria for this licence condition are included in the proposed LCH in Part 2 of this CMD.

The submission of IAP reports supplements the annual submissions of CNL's compliance monitoring reports, which only provide high-level information on CNL's integrated assessment activities. CNSC staff will perform desktop reviews of CNL's required IAPS reports to verify CNL's implemented corrective actions under the WL focused compliance verification plan. This IAP report will provide greater detail about CNL's assessment plan activities for WL and progress will be included in the annual CNL ROR for the Commission.

4.1.4 Conclusion

Based on CNSC staff's assessments of CNL's application, supporting documents, and correction of inspection findings, CNSC staff concluded that CNL met its regulatory requirements and has maintained and implemented a satisfactory management system program at WL.

Although CNL meets its regulatory requirement and has maintained and implemented a satisfactory management system program at WL, CNSC staff recommend an additional licence condition to be included in the proposed licence for this SCA. Licence condition 1.2 requires CNL to submit an annual report detailing the implementation of its integrated assessment plan (IAP) for the WL. Compliance verification criteria for this licence condition are included in the draft LCH.

4.2 Human Performance Management

The Human Performance Management SCA covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures, and tools in place to safely carry out their duties.

The specific areas that comprise this SCA at the WL site include:

- Human performance program
- Personnel training
- Fitness for Duty

4.2.1 Trends

The following table indicates the overall rating trends for the Human Performance Management SCA over the current licensing period:

TRENDS FOR HUMAN PERFORMANCE MANAGEMENT:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	BE
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNSC staff determined that due to missing pre-employment medical assessment records for the WL fire brigade demonstrating fitness for duty of safety related positions and personnel training issues related to workers' training records, CNL's performance in the Human Performance Management SCA does not meet CNSC staff's expectations for 2023.</p>				

4.2.2 Discussion

Human Performance

CNL is obligated to establish and maintain a human performance program that ensures a sufficient number of qualified workers are available for all relevant job areas. This program must also provide the necessary knowledge, skills, procedures, and tools for workers to carry out their duties safely.

At CNL sites, including WL, human performance is established through 2 Program Description and Requirements Documents: Performance Assurance (900-51400-PDD-001) [11] and Performance Assurance (900-51400-PRD-001) [12]. These documents outline the roles and responsibilities of workers, managers, program specialists, and others regarding human performance. These responsibilities include managing, assessing, reviewing, reporting, analyzing, problem-solving, developing, improving, and promoting human performance.

Personnel Training

CNL is required to develop and implement a training system according to [REGDOC 2.2.2, Personnel Training](#). This regulatory document sets out the CNSC's requirements for licensees regarding the development and implementation of a training system. It also provides guidance on how these requirements should be met. CNL describes how REGDOC 2.2.2 requirements are addressed in their corporate-wide training program via 2 documents: Training and Development (900-510200-PDD-001) [13] and Training and Development (900-510200-PRD-001) [14].

Following the WL Fire Protection program deficiencies in 2023 (reported in Event Initial Report, [CMD 23-M25](#)), A CNSC Designated Officer made [a request for information](#) per [GNSCR](#) subsection 12(2) to CNL, requesting CNL to conduct self-assessments of the implementation of the CNL Functions and Programs at WL, including training and development and submitted these to CNSC.

A request under subsection 12(2) of the GNSCR consists of a letter issued by the Commission or a person authorized by the Commission requesting certain information or directing the person to take a specific action, with a response required within a specified time.

The self-assessment revealed that the systematic approach to training (SAT) listed positions at WL do not meet the expectations and directions in training management system documents or external regulations and requirements. There are requirements, responsibilities, and processes that are not being adhered to in training development and execution.

The SAT is the framework endorsed by the CNSC for establishing and maintaining training for persons working in a nuclear facility. The CNSC requires the licensee to ensure that employees and contractors are trained and assessed to confirm that they have acquired and maintain the knowledge, skills, and competencies to safely perform their work assignments.

CNL has initiated an action plan to resolve these gaps and ensure a fully compliant SAT training program. CNSC staff have reviewed and accepted CNL's corrective actions to address the identified issues. CNSC staff will be verifying the implementation of these corrective actions through a CNSC WL-specific compliance verification plan. CNSC staff determined that the risk to the health or safety of persons or impact on the environment is low because of the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations, while CNL implements the corrective actions.

CNSC staff also conducted compliance inspections during the current licensing period to verify the training records of staff in safety-related positions and to ensure that WL maintains a competent and knowledgeable workforce. The results are discussed in the following subsections under past performance.

Fitness for Duty

CNL has implemented [REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*](#), which provides guidance and requirements for managing worker fatigue. The facility adheres to and hours of work procedure, for managing hours of work.

To manage fitness for duty of workers occupying safety-sensitive and safety-critical positions in relation to alcohol and drug use, CNL follows the requirements and guidance outlined in [REGDOC-2.2.4, *Fitness for Duty, Volume II: Managing Alcohol and Drug Use*](#). CNSC staff verified that CNL implements a standard for the Fitness for Duty program. CNL informed CNSC staff that this standard was implemented on July 22, 2021, except for random testing for workers in safety-critical positions at WL due to the requirement being placed on hold pending judicial review.

During the assessment of WL's licence application and past performance, CNSC staff found that WL has established documented processes for ensuring fitness for duty that meet regulatory requirements.

4.2.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.2.3.1 Past Performance

Human Performance

CNL implemented a safety stand-down at WL from November 16, 2020, to February 8, 2021, due to an increase in COVID-19 risk and an unrelated adverse trend in human performance field work activities. This stand-down was discussed further in section 2.1.

CNSC staff performed a general inspection in April 2024 that covered the Human Performance Management SCA. The final report for this inspection has not been issued yet at the time of writing this CMD, however CNSC staff observed that CNL was compliant with CSA N286-12 requirements including work control qualification requirements. CNSC staff did not observe any safety significant findings. CNSC staff will be providing an update at the presentation of this CMD during a public hearing scheduled for October 23-24, 2024.

Personnel Training

In August 2019, CNSC staff conducted an inspection of the security personnel training program at WL. CNSC staff issued 1 notice of non-compliance (NNC) in connection with the program, the information of which is confidential. CNSC staff determined the NNC to be of low risk to safety. CNL submitted corrective action plans, which CNSC staff reviewed and found to be satisfactory in addressing the NNC.

In December 2023, a reactive inspection was conducted at WL in response to safety stand-downs in 2022 and 2023. The inspection revealed 4 NNCs related to outdated training documentation and requirements, inaccurate training records, limited access to training records by supervisors, and inconsistent training program evaluation.

The inspection report was issued to CNL in April 2024. CNL is required to respond to the 4 NNCs with planned corrective actions and commitment dates by June 2024. CNSC staff will review the corrective actions committed by CNL and perform focused compliance verification activities to confirm full implementation of all corrective actions.

WL has a documented SAT based training system. This training system, as outlined in CNL training governance (900-510200-PDD-001 [13], 900-510200-PRD-001 [14], and associated processes, procedures, and work instructions) is aligned with regulatory requirements. However, some of the system outputs were inconsistently implemented during a portion of the licensed period from 2020 to 2023.

Per the CNSC Designated Officer [GNSCR 12\(2\) request](#) made to CNL on May 15, 2023, CNL submitted a self-assessment of its human performance management program to CNSC staff for review. CNL concluded that SAT-listed positions at WL are not compliant with the expectations and directions provided by the CNL Training management system documents or external regulations.

CNL found that there are requirements, responsibilities and processes in place that are not being followed in the development and execution of training at WL. CNL took corrective actions including:

- Developing scheduled updates to SAT training analysis and training plans.
- Developing a training program oversight plan.
- The establishment of quarterly curriculum review committee meetings.
- Integrating SAT positions into CNL's Learning Management System.

CNSC staff reviewed and accepted CNL's corrective actions and will verify the implementation of these corrective actions as part of CNSC staff's WL-focused compliance verification plan for WL. CNSC staff determined that the risk to the health or safety of persons or impact on the environment is low because of the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations, while corrective actions are implemented. Details of the focused compliance verification plan are discussed in the Emergency Management and Fire Protection SCA in subsection 4.10.3.2.

Fitness for Duty

In 2018, CNL provided a gap analysis and implementation plan for [REGDOC-2.2.4, *Fitness for Duty: Managing Worker Fatigue*](#) to CNSC staff. This was done to ensure that CNL would meet all the requirements of the REGDOC. After reviewing and accepting this plan, CNSC staff confirmed on January 21, 2022, that the WL site had implemented the REGDOC 2.2.4 plan. However, random testing for workers in Safety-Critical positions such as the Tiered Response Force or nuclear security force at WL was still pending due to a Federal Court injunction.

On October 27, 2023, the Federal Court of Appeal granted an interim injunction related to the implementation of random testing of workers in safety-critical positions in REGDOC-2.2.4. The order includes a stay of the full implementation of REGDOC-2.2.4, Volume II, paragraphs 5.1 and 5.5 pending the final disposition of the appeal [15].

In March 2021, CNSC staff conducted a remote Human Performance Management SCA focused compliance inspection for WL. During the inspection, it was observed that CNL WL workers had varying levels of understanding of human performance. However, they understood the process to follow when experiencing fatigue and the options available to regain alertness. CNSC staff issued 2 NNCs to CNL to address procedures that did not align with the criteria used to assess employee work schedules and limits on hours of work and recovery periods for safety-sensitive positions. CNSC staff assessed that the risk arising from these non-compliances as low. In August 2021, CNL implemented corrective actions for the 2 NNCs, which CNSC staff reviewed and accepted.

Minimum Staff Complement is an aspect of Fitness for Duty due to its links with hours of work, fatigue, and the presence of sufficiently qualified workers for safe and effective human performance.

In April 2023, CNL WL performed a site-wide safety stand-down related to emergency management and fire protection issues, including training records of fire response workers. During the stand-down, CNL was unable to verify and confirm fire response workers' training, which led to a finding of non-compliance. This violated paragraph 12(1)(a) of the [GNSCR](#) which state that every licensee shall ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and per the Act, the regulations, and the licence. CNL stood down all non-essential work and took corrective actions to train and qualify workers. Further details on this event are discussed in section 2.3.

In August 2023, CNL self-identified that it did not have records or pre-employment medical assessments for 10 newly hired firefighter members, as required. This was in preparation for a CNL reactive inspection to the WL emergency management and fire protection site stand-down.

While preparing to submit firefighter annual medical assessment records to CNL staff, CNL discovered that 8 medical assessments for current employees had lapsed by over 2 months. This was in addition to the missing pre-employment medical records for the 10 newly hired firefighter members. CNL took immediate corrective action to investigate the cause, prevent re-occurrence, and revise CNL procedures. CNL also completed the required medical assessments for the employees and scheduled annual medical assessments for existing employees where assessments had lapsed. CNL staff are satisfied with CNL's corrective actions and have planned follow-up inspections to evaluate CNL's corrective action effectiveness.

4.2.3.2 Regulatory Focus

CNL staff will be increasing regulatory scrutiny and compliance oversight of CNL's activities. This is carried out under a WL specific compliance verification plan that focuses on CNL's human performance management program and other SCAs.

WL has a documented training system to train and qualify workers. However, there are concerns related to workers' training records and the implementation of the WL training system. To address these concerns, CNL staff increased regulatory scrutiny and oversight of WL's training and qualification related activities through a WL-focused compliance verification plan, which is further discussed in the Emergency Management and Fire Protection SCA in subsection 4.10.3.2.

CNL staff will continue regulatory oversight and conduct increased regulatory scrutiny of CNL's performance in the Human Performance Management SCA through a compliance plan. Regulatory oversight activities including onsite inspections, desktop reviews of quarterly and annual compliance reports, and desktop reviews of revisions to relevant program documentation pertaining to this SCA.

4.2.3.3 Proposed Improvements

In December 2023, [REGDOC-2.2.1, Human Performance](#) was published. CNL also revised its Program Description Document: Performance Assurance (900-51400-PDD-001) [11] in December 2023 to align with REGDOC-2.2.1. CNSC staff recommend that REGDOC-2.2.1 be added to a revision of the proposed LCH during the next proposed licence period. To comply with the requirements of REGDOC-2.2.1, CNL will be required to conduct a gap analysis and implementation plan for their Human Performance program.

Additionally, CNSC staff recommend an additional licence condition under the Management System SCA, as discussed in subsection 4.1.3.3 of this CMD. This proposed licence condition, 1.2, requires CNL to submit reports covering the progress of the licensee's integrated assessment plan at WL to the Commission or any person authorized by the Commission. The draft LCH includes compliance verification criteria for this licence condition. By implementing this licence condition, CNSC staff will have an additional avenue of insight into the licensee's assessments, areas in need of corrective action, and increased regulatory scrutiny in compliance oversight.

4.2.4 Conclusion

Given CNL's performance under the fitness for duty and personnel training specific areas in 2023, CNSC staff have rated CNL's performance in the Human Performance Management SCA as below expectations for 2023. CNSC staff will increase monitoring and compliance activities to confirm the effectiveness of the Human Performance, Fitness for Duty and Personnel Training programs implemented at the WL site under a focused compliance verification plan.

Overall, based on the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations, which requires CNSC staff acceptance, CNSC staff determined that the risk to the health or safety of persons or impact on the environment as low.

Despite CNL's performance rating being below expectations for the Human Performance Management SCA, CNSC staff concluded that CNL is qualified to carry out the authorized activities at WL under this SCA. CNL has made progress through its multi-phase recovery plan and implementing corrective measures related to this SCA to safely increase the activities conducted at site in a risk-based manner. CNSC staff have been satisfied with CNL's submissions and progress made to date related to the WL site's recovery plan.

4.3 Operating Performance

The Operating Performance SCA includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.

The specific areas that comprise this SCA at the WL site include:

- Conduct of licensed activity
- Procedures
- Reporting and trending

4.3.1 Trends

The following table indicates the overall rating trends for the Operating Performance SCA over the current licensing period:

TRENDS FOR OPERATING PERFORMANCE:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL has maintained an operating program in accordance with CNSC requirements over the licensing period. CNL continues to be rated SA in the Operating Performance SCA at WL.</p>				

4.3.2 Discussion

CNL is required by the [*Class I Nuclear Facilities Regulations*](#) to ensure measures, policies, methods and procedures for safely operating and maintaining the nuclear facility are in place. This SCA focuses on the conduct of operations and the controls that are in place to manage risks from licensed activities.

Nuclear facilities at the WL site are governed by CNL's Facility Authorization and facility-specific Conduct of Operations documents, which indicate the operational limits and conditions for the various facilities. Facilities in permanent safe shutdown state or undergoing active decommissioning are governed by storage-with-surveillance plans or decommissioning plans, respectively. These governing documents prescribe how each facility is operated and maintained to ensure nuclear safety and that the risk to the public remains low.

The operational limits and conditions for WL are documented in Facility Authorizations, laboratory protocols, criticality safety documents and other documents for other workplaces where operations with fissionable materials are performed.

CNSC's [REGDOC-3.1.2, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills](#), incorporates and clarifies requirements found in the [NSCA](#) and regulations. This regulatory document provides guidance for reports and notifications that licensees must submit to the Commission. It also provides details on the events, situations and dangerous occurrences that must be reported. CNSC staff have verified that CNL's reporting program is implemented through its Management Control Procedure, CNL Reporting to Regulatory Agencies (900-514300-MCP-006) [16].

CNL is currently planning to perform a fuel consolidation project to have spent nuclear fuel baskets from the WL retrieved, packaged and transported to CNL's Chalk River Laboratories (CRL) for consolidated storage. The activities related to the fuel consolidation project are permitted as authorized activities per the current WL licence and would continue to be permitted under the proposed renewed 3-year licence, as CNL is not requesting any amendments to the licence in its licence renewal application. As a result, all spent fuel will be consolidated and safely stored at the CRL site thereby reducing the risk at the WL site. This fuel consolidation project requires facility authorization amendments regarding the transportation of spent nuclear fuel between the 2 CNL sites. Prior to commencement of all fuel shipments, CNL must provide submissions that meet regulatory requirements for CNSC staff review and acceptance. CNSC staff will also perform focused inspections before the commencement of fuel shipments and during fuel shipments.

Verification of CNL's compliance with the requirements of this SCA is an integral part of all CNSC's compliance activities ranging from desktop reviews of reports, project specific documents, events and focused site inspections. CNSC staff confirm that CNL has implemented and maintains an effective Operating Program to ensure licensed activities are performed safely and in compliance with regulatory requirements. CNSC staff conclude that CNL's Operating Performance at the WL site met all applicable regulatory requirements and CNSC staff's expectations. CNSC staff are satisfied that licensed activities at the WL site are conducted in a safe manner.

4.3.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.3.3.1 Past Performance

Conduct of Licensed Activity

CNSC staff performed a general inspection at WL in September 2021 and a facility specific inspection of the WL Waste Management Area (WMA) in October 2022 that verified operating performance criteria. Both inspections determined that CNL met operating performance requirements related to problem identification and reporting, and requirements outlined in the WMA facility authorization document and procedures.

On December 13, 2021, CNL reported an event where an electrical rectifier in WL Building 100 (WR-1) failed due to a faulty control board. CNL needed to perform manual operation of the rectifier to prevent connected batteries from overcharging until a new replacement control board arrived. CNSC staff reviewed and accepted CNL's actions and confirmed that the control board was repaired by January 12, 2022.

On August 23, 2022, CNL submitted a revised Facility Authorization (FA) document regarding the retrieval of spent nuclear fuel baskets from the Concrete Canister Storage Facility (CCSF) at WL. After a desktop review by CNSC staff, areas needing clarification were identified and communicated to CNL. CNL responded to these comments, and CNSC staff found their responses satisfactory and accepted the revised CCSF FA.

On April 28, 2023, operational activities at WL were restricted to essential compliance and maintenance work because of a CNL self-assessment on Fire Protection. CNL committed to the CNSC that WL site would be maintained in the non-operational state pending the completion of a Root Cause Analysis and the acceptance of a multi-phase site restart plan, which CNL submitted on July 13, 2023. CNSC staff maintain regulatory oversight while CNL implements the multi-phase work restart approach prior to resuming normal operations. The Commission was informed of the stand down of operational activities and CNSC staff regulatory oversight on June 28, 2023, Event Initial Report ([CMD 23-M25](#)).

CNSC staff also performed a general inspection that covered several SCAs in April 2024, including the Operating Performance SCA. The final report for this inspection has not been issued at the time of writing this CMD. CNSC staff did not observe any safety significant findings during this inspection.

Procedures

CNL's Management System consists of high-level documentation supported by lower-level procedures. CNL maintains a comprehensive suite of procedures across all programs and facilities at the WL site. CNL continually updates the facility-specific procedures as needed to support ongoing process improvements at the WL site.

CNSC staff review procedure level documents as part of ongoing compliance verification activities. Based on these reviews, CNSC staff conclude that the changes made to CNL's procedures were carried out in accordance with CNL's change control process and there were no significant changes to operating documentation that could have affected the safe operation of the facilities at the WL site.

Reporting and Trending

Detailed requirements for reporting unplanned situations or events at the WL site to the CNSC are included in the WL LCH. During the current licence period, CNL has complied with the regulatory requirements for submissions of these reports.

Events reported to the CNSC by CNL are presented in Table 1.

Table 1: Reportable Events for the WL Site

Year	2019	2020	2021	2022	2023
Total	1	4	6	3	15

There is a notable increase in the number of reportable events from 2022 to 2023. Several of these reportable events were related to the site stand-down event in 2023. CNL began conducting root cause analysis actions which revealed additional program deficiencies qualifying as reportable to CNSC staff. CNL's site stand-down event is discussed in section 2.3.

CNSC staff review all reported events to identify if there are any regulatory concerns and report significant events to the Commission at public meetings of the Commission. There was 1 event initial report (EIR) related to the WL site presented to the Commission during the licence period. CNSC staff presented "EIR: Safety stand-down at Canadian Nuclear Laboratories' Whiteshell Site following the discovery of non-compliances in the fire protection program" to the Commission on June 28, 2023 ([CMD 23-M25](#)).

CNL also submits annual reports on compliance monitoring and operating performance of facilities at the WL site, as required by licence condition 3.2 of the current licence. CNSC staff reviewed these reports and no significant regulatory issues were identified during the review.

4.3.3.2 Regulatory Focus

CNSC staff continue to monitor CNL's performance in this SCA through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation.

CNL is currently progressing with low-risk conventional construction work required to support decommissioning and waste consolidation. During this phase of the WL multi-phase restart plan, workers are retrained on the revised procedures to ensure the effectiveness of the required actions identified from the April 2023 stand-down. In addition, CNL has committed to providing an updated WMA Facility Authorization document to reflect current site conditions and operations in January 2025. CNSC staff continue to conduct increased regulatory scrutiny and oversight of CNL's activities related to its multi-phase restart plan and the gradual phased increase in construction work.

Concerning CNL's fuel consolidation project (further discussed in subsection 4.14), CNSC staff expect CNL to submit a further revised CCSF FA prior to allowing retrieval of spent nuclear fuel baskets from the CCSF. CNSC staff will review CNL's revised CCSF FA for CNSC staff's acceptance when it is submitted.

CNSC staff will focus compliance verification activities on operational activities at the WL site. As CNL's activities on the WL site continues its progress towards decommissioning and demolition activities and the transport of waste offsite, CNSC staff's compliance activities will focus on verification of the safe conduct of these activities.

4.3.3.3 Proposed Improvements

CNSC staff recommend an amendment to licence condition 3.2: Reporting Requirements to include an additional annual compliance monitoring report (ACMR) to align with the new proposed licence condition 1.2 discussed under the Management System SCA in subsection 4.1.3.3. This amendment under licence condition 3.2 adds the requirement for the submission of WL Integrated Assessment Plan report annually by April 30th in alignment with other required ACMRs. Details of the licence condition amendment are included in the proposed LCH in Part 2 of this CMD.

4.3.4 Conclusion

During the current licence period, CNSC staff observed that CNL has operated WL in compliance with the CNSC's regulatory requirements. There are no challenges with CNL's implementation of this SCA.

Based on CNSC staff assessments of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective operating program for the WL site in accordance with regulatory requirements.

4.4 Safety Analysis

The Safety Analysis SCA covers maintenance of the safety analysis that supports the overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

The specific areas that comprise this SCA at the WL site includes:

- Deterministic safety analysis
- Criticality safety
- Hazard analysis

4.4.1 Trends

The following table indicates the overall rating trends for the Safety Analysis SCA over the current licensing period:

TRENDS FOR SAFETY ANALYSIS:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL has over this licensing period maintained a safety analysis program in accordance with CNSC requirements. CNL continues to be rated SA in this SCA at WL.</p>				

4.4.2 Discussion

CNL is required by the [Class I Nuclear Facilities Regulations](#) to prepare final safety analysis reports (SARs) demonstrating the adequacy of the design for every Class I nuclear facility. CNL has implemented a safety analysis program that ensures systematic evaluation of the potential hazards associated with the conduct of proposed activities and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards. CNL WL safety analysis program is established through its Program Description and Requirements Documents: Safety Analysis (900-508770-PDD-001) [17] and Safety Analysis (900-508770-PRD-001) respectively [18].

CNL updates the SARs over time as operational requirements change and are carried out in accordance with the requirements of the licensing basis. CNSC staff monitor changes to the SARs to ensure continued compliance with the licensing basis. CNL maintains SARs for all Class I nuclear facilities at the WL site: the Shielded Facilities, Waste Management Areas and Concrete Canisters Shielded Facilities.

CNL also produces Nuclear Safety Note (NSN) documents and submits them to CNSC staff for review and acceptance. NSN documents act as extensions to safety analysis reports for Class I nuclear facilities.

CNL is required to implement and maintain a nuclear criticality safety program compliant with [REGDOC-2.4.3, Nuclear Criticality Safety](#). CNL is implementing a company-wide criticality safety program, that is used at WL via its Program Description and Requirements Documents: PDD (900-508550-PDD-001) [66] and Nuclear Criticality Safety PRD (900-508550-PRD-001) [66]. CNL has developed a suite of nuclear criticality safety program documents that have been reviewed by and have been found acceptable to CNSC staff.

CNSC staff note that there are no operating reactors at the WL site, and the storage of low risk irradiated fuel is the main activity involving fissionable materials on site. The CNSC applies a graded approach to safety analysis, corresponding with the level of risk of the facilities on the WL site.

CNL is currently planning to perform a fuel consolidation project to have spent nuclear fuel baskets from the WL retrieved, packaged and transported to CNL's Chalk River Laboratories (CRL) for consolidated storage. The activities related to the fuel consolidation project are permitted as authorized activities per the current WL licence and would continue to be permitted under the proposed renewed 3-year licence, as CNL is not requesting any amendments to the licence in its licence renewal application. This fuel consolidation project has safety analysis and nuclear criticality safety implications regarding the transportation of spent nuclear fuel between the 2 CNL sites.

Over the licensing period, CNSC staff conducted desktop reviews and 1 site inspection of CNL's safety analysis documentation and concluded that CNL's safety analysis at the WL site met applicable regulatory requirements and CNSC expectations.

4.4.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.4.3.1 Past Performance

Deterministic Safety Analysis

Concerning CNL's fuel consolidation project, on August 23, 2022, CNL submitted a Nuclear Safety Note (NSN) regarding the retrieval of spent nuclear fuel baskets from the Concrete Canister Storage Facility (CCSF) at WL, which focuses on retrieving, transferring, and loading spent nuclear fuel bundles for transport. After a desktop review by CNSC staff, areas needing clarification were identified and communicated to CNL. CNL responded to these comments, and CNSC staff found their responses satisfactory and accepted the NSN.

In March 2023, CNSC staff requested CNL to provide a implementation plan and gap analysis for compliance towards [REGDOC-2.4.4, Safety Analysis for Class IB Nuclear Facilities](#) as part of WL licensing basis. This regulatory document clarifies requirements and provides guidance for applicants and licensees on how to demonstrate the safety of a Class IB nuclear facility, including information relating to a safety analysis program, the conduct of a safety analysis including the systematic evaluation of potential hazards, safety analysis documents and records and reporting. CNL submitted an implementation plan and gap analysis pertaining to REGDOC-2.4.4 in October 2023 that CNSC staff reviewed and accepted. CNL is working on the full implementation of REGDOC-2.4.4 at WL, with a committed effective date for implementation of December 31, 2026.

CNSC staff performed a general inspection that covered several SCAs in April 2024, including the Safety Analysis SCA. CNSC staff did not observe any safety significant findings during this inspection. The final report for this inspection has not been issued yet at the time of writing this CMD.

Criticality Safety

CNL maintains and updates its criticality safety documents (CSDs), and CNSC staff reviewed changes to the CSDs as they have been revised by CNL. Based on the reviews, CNSC staff concluded that CNL continues to revise and update the CSDs to reflect changes in operations with fissionable materials, in accordance with CNSC regulatory requirements under licence condition 3.1: Operating Program and licence condition 4.2: Nuclear Criticality Safety.

During this licensing period, CNL had 2 reportable events in 2020 and in 2021. The 2020 reportable event concerned CNL failing to submit notification to CNSC staff of a revised criticality safety document for the Concrete Canister Storage Facility (CCSF). The 2021 reportable event pertained to an inspection of 16 canisters at CCSF for fuel basket removal. The lids were stitch welded to the canister liner, but a design engineering change for an alternate seal mechanism involving silicone caulking remained incomplete. This breaches the third containment barrier per the CCSF SAR. CNL decided to fully weld the canisters shut from May 10-28, 2021, under International Atomic Energy Agency (IAEA) inspector observation to align with safety protocols. CNL continues to review the use of a sealant. Both events were assessed by CNSC staff and determined to have low safety significance level and pose no risk to the environment or the public.

Hazard Analysis

Additional details on CNL's hazard analysis with respect to climate change considerations and safety analysis can be found in CNSC staff's Environmental Protection Review Report in Appendix F of this CMD.

4.4.3.2 Regulatory Focus

CNSC staff continue to monitor CNL's performance in this SCA through regulatory oversight activities, including onsite inspections and desktop reviews of relevant program documentation, new and/or revised safety analysis and criticality safety documents.

Concerning CNL's fuel consolidation project (further discussed under the Packaging and Transport SCA in subsection 4.14), CNSC staff expect CNL to submit revised CCSF CSDs prior to retrieval of spent nuclear fuel baskets from the CCSF for each phase of the project. CNSC staff will review CNL's revised CCSF CSDs for acceptance when they are submitted.

As activities with fissionable materials will transition from storage with surveillance to active decommissioning, CNL will continue to review and revise its safety analyses and criticality safety documents to reflect these changes. CNSC staff will continue to review these changes for compliance with the regulatory requirements and the licensing basis.

4.4.3.3 Proposed Improvements

Proposed improvements are included in the proposed licence conditions handbook (LCH) in Part 2 of the CMD. In short, the proposed LCH includes a requirement for CNL to review and revise as necessary the SARs for each Class IB facility every 5 years to ensure that the condition of each facility and the accident scenarios assessed are accurate. As discussed earlier, [REGDOC-2.4.4, *Safety Analysis for Class IB Nuclear Facilities*](#) will be a compliance verification criterion that CNL will be required to comply to by December 31, 2026.

In addition, CNSC staff recommend the addition of CNL WL facility criticality safety documents (CSD) as licensee documents that require notification of change under licence condition 4.2: Nuclear Criticality Safety. Under the current licence, notification of change of CNL WL CSDs is implicitly required under licence condition 3.1: Operating Program through facility authorization documents. These facility authorization documents are licensee documents requiring notification of change. This is an opportunity for improvement to explicitly list CSDs as documents requiring notification of change under licence condition 4.2 for clarity.

4.4.4 Conclusion

There are no challenges with CNL's implementation of this SCA. Based on CNSC staff assessments of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain a Safety Analysis program at the WL site in accordance with regulatory requirements.

4.5 Physical Design

This SCA relates to activities that impact on the ability of systems, components and structures to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

Given that the WL site is undergoing decommissioning, there is very little activity on physical design.

The specific areas that comprise this SCA at the WL site include:

- Design governance
- Site characterization – (no significant observations to report)
- Facility design – (no significant observations to report)
- Structure design – (no significant observations to report)
- System design – (no significant observations to report)
- Component design – (no significant observations to report)

4.5.1 Trends

The following table indicates the overall rating trends for the Physical Design SCA over the current licensing period:

TRENDS FOR PHYSICAL DESIGN:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p>Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL continues to be rated SA in this SCA at WL. CNSC staff conclude that CNL WL Physical Design performance meets regulatory requirements.</p>				

4.5.2 Discussion

CNL is required to implement and maintain a design program so that design of facilities is managed using a well-defined systematic approach. Implementing and maintaining a design program confirms that safety-related structures, systems and components (SSC), and any modifications to them, continue to meet their design basis taking new information and changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility conditions.

Design Governance

An important cross-cutting element of a design program is design basis management. CNL WL design program is established through its Program Description and Requirements Documents: Design Authority and Design Engineering (900-508120-PDD-001) [19] and Design Engineering (900-508120-PRD-001) [20] respectively.

CNL's Fire Protection Program at the WL site identifies how protection from fire is achieved through planned, coordinated and controlled activities to reduce the risk to the health and safety of persons and to the environment from a fire. CNL is required to carry-out fire protection assessments, which include code compliance reviews (CCR) and Fire Hazard Analysis (FHA), for the WL site facilities in accordance with the CSA-N393-13, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* standard [55], as well as key standards referenced herein, such as the *National Building Code of Canada*, *National Fire Code of Canada*, and associated *National Fire Protection Association (NFPA)* standards.

CNL implements a pressure boundary program that comprises of several programs, processes and procedures and associated controls that are required to ensure compliance with CSA standard N285.0-08, *General requirements for pressure-retaining system and components in CANDU nuclear power plants* [64].

CSA standard N285.0-08 defines the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination and inspection of pressure-retaining and containment systems, including their components and supports. CNL WL's pressure boundary program is implemented through its Program Description and Requirements Documents: Pressure Boundary (900-508140-PDD-001) [21] and Pressure Boundary, 900-508140-PRD-001) [22] respectively.

CNL WL has implemented 2 documents to ensure the safety of its pressure-retaining systems and components. The first document is the Code Classification and Design Registration of Pressure-Retaining System/Components (WLD-508140-PRO-001) [23] procedure, which outlines the requirements and processes for registering these systems and components at WL. The second document is the WL Pressure Boundary Quality Assurance Plan (WL-508140-QAP-001) [24], which describes the quality control program at WL for the manufacture, design, construction, examination, installation, repair, modification, and replacement of pressure vessels and piping systems. This Quality Assurance Plan ensures that all pressure vessels and piping systems meet the requirements of the Statutes and Regulations of the Province of Manitoba.

CNSC staff confirm that CNL has implemented and maintained a design program to ensure the ability of systems, structures and components to meet and maintain their design basis. CNSC staff concluded that CNL's physical design measures at the WL site meet all applicable regulatory requirements and CNSC expectations.

4.5.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.5.3.1 Past Performance

Design Governance

Fire Protection Program

CNL reported an unplanned event to CNSC staff on October 18, 2023, regarding Shielded Facilities (Building 300) fire dampers not being maintained and missing from the WL Preventative Maintenance Regulatory (PMR) schedule. CNL fire protection staff conducted an extensive evaluation of the Inspection, Testing, and Maintenance (ITM) for fire systems at WL and discovered that a significant number of fire dampers were not included in the PMR schedule, despite being essential for safety. These dampers had not been inspected or maintained since their installation in 2013, indicating a lack of configuration control.

The Shielded Facilities are under a site-wide stand-down with reduced operations to only essential maintenance activities. The Hot Cells, used for the handling of radioactive substances in the Shielded Facilities are also not in operation.

Therefore, due to the state of the facility and the absence of high hazard work, the safety risk and hazards associated with this event are low.

To address this issue, CNL began an extent of condition evaluation to identify all necessary fire dampers and ensure they are included in the PMR schedule. Additionally, CNL is performing field verifications and a fire protection review to determine which dampers must be maintained as fire dampers in buildings with fire separations. The outcomes of these assessments will be incorporated into the maintenance procedures and tracked for routine inspection. CNSC staff reviewed CNL's corrective actions and determined that CNL's actions were appropriate. CNL is expected to complete the corrective actions for this event by end of summer 2024. CNSC staff will verify CNL's completion and implementation of the corrective actions under the WL-focused compliance verification plan.

Pressure Boundary Program

During the current licensing period, CNL has maintained their pressure boundary QAP WL-508140-QAP-001 [24] and holds the Certificate of Authorization to perform Pressure Boundary work as described in the Quality Assurance Plan. CNL has recently updated their pressure boundary procedure to reflect the revised code effective date of CSA N285.0 from 2008 to 2017. CNSC staff have reviewed CNL's pressure boundary procedure, along with their gap analysis and implementation plan to CSA N285.0-17 for WL and has determined that it is acceptable.

Through desktop reviews, and focused technical discussions, CNSC staff have concluded that the pressure boundary systems at WL meet all the regulatory requirements.

Regulatory Focus

CNSC staff will continue to monitor CNL's performance in this SCA at the WL site through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation, and review of designs for new or modified facilities.

The QAP [24] for CNL's site pressure boundary, which is currently in place, will expire in August 2024. CNL plans to renew its QAP by working with Inspection Technical Services Manitoba, which is the provincial authorized inspection agency for pressure boundary matters. Once CNL's new QAP is renewed, CNL will submit the renewed QAP for CNSC staff by the end of 2024.

CNL plans to design and construct facilities for the remediation of the Standpipes and Intermediate Level Waste (ILW) Bunkers. Standpipes are vertical, in-ground storage structures, located within the WL Waste Management Area (WMA) which provide storage for ILW or high-level waste (HLW) packages. There are 171 standpipes constructed within the WMA where CNL plans to have emptied of their contents and removed soon. CNL plans to construct several supporting facilities for the removal, characterization, packaging, and shipment of the ILW and HLW waste from the Standpipes and ILW Bunkers, which are authorized activities under current WL licence and would continue to be under the proposed 3-year licence period. CNSC staff will review the design of these facilities and conduct field verification activities prior to their operation.

4.5.3.2 Proposed Improvements

CNSC staff recommend that the Update No 1 of CSA N285.0-17 be included in the renewal LCH Section 5.2 “Pressure Boundary Program”.

CNSC staff continue to review the design of facilities prior to the operation of new facilities at the WL site. This will include field verification activities, a review of the standpipe and intermediate bunker remediation facility design.

4.5.4 Conclusion

There are no challenges with CNL’s implementation of this SCA.

CNSC staff confirmed that CNL followed its approved design and change management program in managing changes and improvements to the WL during the licence period. Based on CNSC staff assessments of CNL’s application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain programs for pressure boundary and design at the WL site in accordance with regulatory requirements.

4.6 Fitness for Service

The fitness for service SCA covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that verify all equipment is available to perform its intended design function when called upon to do so.

The specific areas that comprise this SCA at the WL site include:

- Maintenance
- Structural integrity

4.6.1 Trends

The following table indicates the overall rating trends for the Fitness for Service SCA over the current licensing period:

TRENDS FOR FITNESS FOR SERVICE:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL has over this licensing period maintained a fitness for service program in accordance with CNSC requirements. CNL continues to be rated SA in this SCA at WL.</p>				

4.6.2 Discussion

CNL is required to implement and maintain a fitness for service program to cover activities that impact on the physical condition of systems, components and structures to ensure that they remain effective over time. CNL implements 2 fitness for service program documents to meet these requirements via a program description document and program requirements document: Fitness for Service (900-508230-PDD-001) [25] and Fitness for Service (900-508230-PRD-001) [26].

The fitness for service program at the WL site focuses on in-service inspections of the concrete bunkers in the WMA. CNL WL implements a periodic inspection plan (PIP) for scheduled examination of the concrete bunker structures in WL WMA through WL PIP document, Periodic Inspection Plan for Whiteshell Laboratories Waste Management Area Concrete Bunkers (WLD-106100-PLA-001) [27]. The PIP ensures that the structures are functioning as designed and remain fit for service.

Elements of the fitness for service program requirements are incorporated into CNSC routine and planned compliance activities. CNSC inspections carried out at the site verified and confirmed that:

- in-service inspections of safety related structures are carried out by CNL as required,
- safety related equipment is maintained in good working order and, where required, and
- components are appropriately calibrated and are tested at the requisite frequency.

Therefore, CNSC staff have concluded that CNL's fitness for service program at WL meets the applicable regulatory requirements and CNSC expectations.

4.6.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.6.3.1 Past Performance

Maintenance

As part of their management system, CNL is required by CSA N286-12 to have processes in place to maintain systems, structures and components (SSCs). CNSC staff reviewed CNL's governing documents for the conduct of maintenance at the WL site and concluded that the program meets regulatory requirements.

CNSC staff performed an inspection at WL Waste Management Area (WMA) in October 2022, that focused on evaluating CNL's activities including fitness for service and maintenance. CNSC staff found that routine maintenance was being conducted according to the required frequency per the WL WMA facility authorization document.

CNL reported to CNSC staff an unplanned reportable event in October 2021 where CNL determined that preventative maintenance (PM) activities were incorrectly archived as per the facility maintenance plan (FMP) for the Shielded Facilities building stemming from an information request from CNSC staff in support of a compliance inspection. CNL performed an extent of condition into maintenance activities in all WL nuclear facility FMPs and facility systems important to safety. Despite the missed maintenance, there were no safety concerns due to multiple layers of defense mechanisms in place including regular monitoring, in service alarms and immediate completion of preventive maintenance on safety systems. CNSC staff met with CNL staff on a regular basis to ensure the completion of outstanding PMs and the implementation of corrective actions. CNSC staff are satisfied with CNL's corrective actions to prevent reoccurrence.

Overall, CNSC staff have found that SSCs were well-maintained. Based on CNSC compliance activities and desktop reviews of CNL submissions, CNSC staff have concluded that CNL has met the regulatory requirements related to this specific area.

Structural Integrity

CNL is required to conduct annual inspections of the WL Waste Management concrete bunkers in accordance with the PIP [27] and report the results annually to CNSC staff.

Additionally, CNL performs quarterly inspections of the Concrete Canister Storage Facility (CCSF). These CCSF inspections have shown no significant cracking or spalling.

CNSC staff have reviewed the inspection reports submitted by CNL and concluded that the WL Waste Management concrete bunkers and the CCSF are fit-for-service.

Based on CNSC staff inspections and reviews of the PIP and CCSF inspection reports submitted by CNL, CNSC staff conclude that CNL has met the regulatory requirements related to this specific area.

4.6.3.2 Regulatory Focus

CNSC staff continue to maintain oversight of the fitness for service program until the facilities are decommissioned.

CNSC staff continue to monitor CNL's performance in this SCA through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation.

4.6.3.3 Proposed Improvements

No improvements within this SCA are proposed.

4.6.4 Conclusion

There are no challenges with CNL's implementation of this SCA.

Based on CNSC staff assessments of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain effective fitness for service programs at the WL site in accordance with regulatory requirements.

4.7 Radiation Protection

The Radiation Protection SCA covers the implementation of a radiation protection (RP) program in accordance with the [Radiation Protection Regulations](#). The program must ensure that contamination levels and radiation doses received by individuals are monitored, controlled and maintained As Low As Reasonable Achievable (ALARA).

The specific areas that comprise this SCA at the WL site include:

- Application of ALARA
- Worker dose control
- Radiation protection program performance
- Radiological hazard control

4.7.1 Trends

The following table indicates the overall rating trends for the Radiation Protection SCA over the current licensing period:

TRENDS FOR RADIATION PROTECTION:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNSC staff conclude that CNL's implementation of the radiation protection program at the WL site meets regulatory requirements and CNSC expectations. CNSC staff are satisfied that licensed activities at the WL site are conducted in a safe manner.</p>				

4.7.2 Discussion

CNSC staff's assessment of performance considers indicators such as monitoring of performance data, event reviews and results of compliance inspections.

4.7.3 Summary

4.7.3.1 Past Performance

Application of ALARA

CNL's application of ALARA within the RP program includes management commitment and oversight, personnel qualification and training, provision of design features to optimize radiological exposures and provision of protective equipment and clothing. CNL also has a documented ALARA program implemented at the WL site to control doses and minimize exposures to workers. This program integrates ALARA into the design, planning, management and control of radiological activities. Dose control points (DCPs) are used as a dose management tool for workers' radiological exposures and from 2019 to 2023, no workers' dose exceeded their assigned DCP.

Radiological work assessments and radiological work plans are prepared and used to ensure that work activities at the WL site will integrate the ALARA principle and provide effective controls to prevent unplanned exposures. Work activities incorporate radiological control alert and back-out points, individual and collective dose estimates, and control measures to ensure the radiation safety of workers.

On December 19, 2019, the Commission provided the Record of Decision [28] from the public hearings conducted October 2-3, 2019, regarding CNL's request for the renewal of the Nuclear Research and Test Establishment Decommissioning Licence (NRTEDL) for WL. In this decision, the Commission requested that CNSC staff provide a systematic assessment of the potential effects on the collective occupational dose from the proposed accelerated decommissioning at the WL site, compared to the deferred decommissioning strategy assessed in the original WL Comprehensive Study Report [29]. To address the Commission request, CNSC staff requested CNL perform an ALARA assessment addressing the impacts of accelerated decommissioning.

In 2020, CNL provided an assessment of the potential impact of an accelerated decommissioning approach on both collective and individual doses, including the assumptions and calculations used to derive the dose estimates. CNSC staff reported on this additional information in CMD 20-M22, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2019 [30]. The accelerated decommissioning approach is similar to the deferred decommissioning approach originally selected, but with full site decommissioning commencing with no deferment period and radioactive waste being sent off-site to CNL's Chalk River Laboratories (CRL) for interim storage until suitable disposal facilities are available. The accelerated decommissioning approach also assumes *in situ* decommissioning of the WR-1 Reactor, rather than full dismantlement.

In summary, the total collective dose for the accelerated decommissioning approach (site end-state achieved in an accelerated 10-year period) is estimated to be 520 person-millisieverts¹ (p-mSv), compared to a total collective dose estimate of 205 p-mSv for the deferred decommissioning approach (site end-state achieved in a 60-year period). As shown, the accelerated decommissioning approach is expected to increase the collective dose of up to 320 p-mSv. One of the main factors responsible for this increase is reduced radioactive decay, which contributes to a collective dose estimate of 210 p-mSv. The second factor is the inclusion of workers at CRL. The accelerated decommissioning approach would involve receipt and placement of WL waste packages into interim storage at CRL, and subsequent retrieval, transfer, and placement into a final disposal facility. The collective dose estimate for CRL workers associated with these activities is 110 p-mSv.

CNL concluded that RP program requirements and the suite of radiological action levels implemented at the WL site are appropriate to provide assurance that worker exposures can be managed and controlled during the proposed period of accelerated decommissioning. CNSC staff note that decommissioning alternatives should not be compared, judged and/or selected based on radiation dose estimates alone, as the end states and benefits associated with each alternative will vary.

CNSC staff determined that decommissioning activities have and can be performed within CNSC regulatory dose limits and following the ALARA principle.

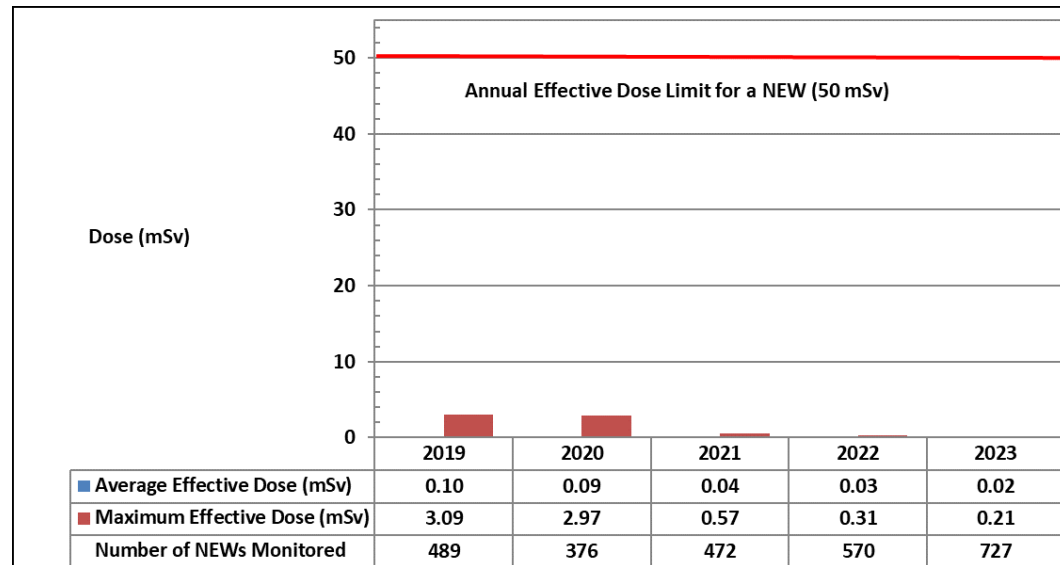
Worker Dose Control

CNL has effectively controlled worker doses at the WL site. Radiation exposures of workers are ascertained, recorded, and monitored to ensure compliance with the CNSC's regulatory dose limits and to maintain radiation doses ALARA. At WL, workers – including employees and contractors – conducting work activities which present a reasonable probability of receiving an occupational dose greater than 1 millisievert (mSv)/year are identified as Nuclear Energy Workers (NEWs). External and internal dosimetry are provided by CNL's licensed dosimetry service. From 2019 to 2023, no NEW received a radiation dose more than the CNSC regulatory dose limits.

¹ Person-millisieverts is a unit of measurement for the annual collective dose for workers (the sum of the effective doses received by all the workers at a facility in a year).

Figure 5 provides the average and maximum effective doses received by NEWs at the WL site from 2019 to 2023.

Figure 5: Effective doses to NEWs at WL, 2019-2023



The maximum effective dose received by a NEW was 3.09 mSv occurring in 2019. This represents approximately 6% of the CNSC regulatory limit for an effective dose of 50 mSv in a 1-year dosimetry period. The dose fluctuations from year to year are attributed to the scope and duration of the radiological work conducted, along with the dose rates associated with the work. No adverse trends are identified over 2019-2023. Before 2019, there was an increasing trend in worker doses as decommissioning activities began to focus on buildings and facilities with increased radiological hazards. Nevertheless, worker exposure remained well controlled and at a small fraction of the CNSC's regulatory dose limits. Worker doses show a decreasing trend starting in 2021, with the completion of decommissioning activities of the Active Liquid Waste Treatment Centre (Building 200) in 2020, and the safety pause instituted at the WL site in June 2022. Effective doses received in 2023 were mainly due to maintenance activities in the WL Shielded Facilities building.

As shown in Table 1 and Table 2, equivalent doses (skin and extremities, respectively) at the WL site were below the CNSC regulatory equivalent dose limits for a NEW from 2019-2023.

The maximum equivalent dose for the skin, received by a NEW, was 7.47 mSv, occurring in the year 2019. This represents approximately 1.5% of the CNSC regulatory limit for an equivalent dose for the skin of 500 mSv in a 1-year dosimetry period.

Table 1: Equivalent doses for the skin of NEWs at WL, 2019-2023

Dose Data	2019	2020	2021	2022	2023	CNSC Regulatory Limit
Average skin dose (mSv)	0.20	0.16	0.05	0.03	0.02	n/a
Maximum skin dose (mSv)	7.47	6.80	0.94	0.66	0.40	500 mSv/year

The maximum equivalent dose for the hands (extremities), received by a NEW, was 37.77 mSv, occurring in the year 2019. This represents approximately 7.6 percent of the CNSC regulatory limit for an equivalent dose for hands of 500 mSv in a 1-year dosimetry period.

Table 2: Equivalent doses for the extremities of NEWs at WL, 2019-2023

Dose Data	2019	2020	2021	2022	2023	CNSC Regulatory Limit
Average extremity dose (mSv)	4.80	1.43	0.45	0.27	0.02	n/a
Maximum extremity dose (mSv)	37.77	6.46	1.86	1.38	0.08	500 mSv/year

From 2019 to 2023, the maximum individual effective dose to a non-NEW at the WL site was 0.11 mSv, occurring in 2021. The effective doses received by non-NEWs at the WL site have been well below the CNSC's regulatory effective dose limit for persons who are not NEWs of 1 mSv in 1 calendar year.

Radiation Protection Program Performance

CNL has effectively implemented the RP program at the WL site. This program satisfies the requirements of the [Radiation Protection Regulations](#) and includes several performance indicators to continuously monitor RP program performance.

CNSC staff conducted a focused CNSC inspection of the Radiation Protection SCA in May 2022. The inspection resulted in no notices of non-compliance and confirmed CNL's overall compliance with the [Radiation Protection Regulations](#). CNSC staff made recommendations of opportunities for improvement with certain forms and records generated as part of CNL's RP program requirements.

Action levels for radiological exposures are established as part of CNL's RP program. If an action level is reached, it triggers CNL staff to establish the cause and, if applicable, restore the effectiveness of the RP program. There have been no radiological action levels reached from 2019 to 2023 at the WL site. CNL reviewed and revised radiological action levels across all CNL sites, including WL, to assure consistency with CNSC regulatory guidance. CNSC staff reviewed the revised action levels and found that CNL demonstrated that the action levels are appropriate for the purposes of section 6 of the *Radiation Protection Regulations*. The current set of radiological action levels was implemented at the WL site in 2020.

Radiological Hazard Control

Radiation and contamination control programs continued to be effectively implemented at the WL site to control and minimize radiological hazards and the spread of radioactive contamination. Methods of control include the use of radiation zone controls, surface contamination monitoring, in-plant air monitoring and radiological dose rate surveys.

4.7.3.2 Regulatory Focus

CNSC staff have not identified any specific areas of regulatory focus for the Radiation Protection SCA.

4.7.3.3 Proposed Improvements

CNSC staff have not identified any proposed improvements for the Radiation Protection SCA.

4.7.4 Conclusion

CNL continues to effectively implement their RP program to ensure that the radiological activities comply with the *Radiation Protection Regulations*. CNSC staff concluded that CNL met applicable requirements and expectations for performance with respect to the Radiation Protection SCA at the WL site. CNL continued to be rated SA in this SCA at the WL site from 2019 to 2023. CNSC staff conclude that the performance in the Radiation Protection SCA has met regulatory requirements.

4.8 Conventional Health and Safety

The Conventional Health and Safety SCA relates to the implementation of a program to manage workplace safety hazards and to protect workers.

The specific areas that comprise this SCA at the WL site include:

- Performance
- Practices
- Awareness

4.8.1 Trends

The following table indicates the overall rating trends for the Conventional Health and Safety SCA over the current licensing period:

TRENDS FOR CONVENTIONAL HEALTH AND SAFETY:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL continues to be rated SA in this SCA at WL. CNSC staff conclude that CNL's Conventional Health and Safety performance meets regulatory requirements.</p>				

4.8.2 Discussion

The CNSC requires licensees of Class I Nuclear Facilities to develop, implement and maintain effective safety programs, to promote a safe and healthy workplace for employees, and to minimize the incidence of occupational injuries and illnesses. The CNSC, through the [NSCA](#) and regulations, requires CNL to identify potential safety hazards, assess the associated risks, and implement the necessary materials, equipment, programs and procedures to effectively manage, control and minimize these risks at WL.

The occupational health and safety programs at WL comprise several components designed for employees, visitors and contractors. This health and safety program has been developed to meet legislated requirements and internal standards. The programs include audits, inspections, training, incident reporting and tracking, objectives and targets, hazard identification, risk assessments, job hazard analysis, key performance indicators, and regular safety meetings.

CNL has implemented and maintains a conventional health and safety program to manage workplace safety hazards and to protect personnel and equipment. The nature of the activities related to decommissioning, dismantlement and demolition of redundant structures at the WL site make conventional health and safety an important program, for this site.

CNSC staff on inspection routinely observe workers' compliance with requirements related to the proper use of personal protective equipment and clothing (PPE&C), the use of proper signage and barriers and the general state of work sites. CNSC staff concluded that CNL's Conventional Health and Safety SCA at the WL site met all applicable regulatory requirements and CNSC expectations.

4.8.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.8.3.1 Past Performance

Practices

In addition to the [NSCA](#) and its associated regulations, CNL's activities must comply with Part II: *Occupational Health and Safety* of the [Canada Labour Code](#), its [Canada Occupational Health and Safety Regulations](#), and other applicable federal and provincial health and safety acts and regulations.

CNL's occupational health and safety program applies to all work performed by CNL employees, and to work performed by others on sites and workplaces controlled by CNL.

In September 2021, CNSC staff performed a general inspection that covered the Conventional Health and Safety SCA. CNSC staff observed that warning signs on equipment like and electrical box and propane storage were not clearly visible or faded. CNSC staff determined these findings to be of negligible safety significance. CNL updated their housekeeping form to ensure that warning signs are legible and clearly visible. CNSC staff accepted CNL's corrective actions and considered them to be satisfactory.

In May 2022, WL experienced an event where a worker received an electrical shock while performing maintenance activities on a pump. As a result of this incident, WL Senior Leadership immediately initiated a safety stand-down of all hazardous energy control work. This stand-down was discussed further in section 2.2.

Awareness

CNL actively promotes conventional health and safety through the provision of information, training, instructions, and supervision. Employees are encouraged to participate and to report concerns (e.g., unsafe conditions, non-compliance, or events) to identify hazards and ensure measures are put in place to prevent injury and illness.

CNL documents issues and opportunities for improvement through a problem identification and resolution mechanism referred to as "ImpAct". CNSC staff monitors CNL employee reports of safety concerns through the initiation of "ImpActs".

CNSC staff are satisfied with CNL's promotion of health and safety awareness at WL.

Performance

The key performance indicators for conventional health and safety are the number of recordable lost-time injuries (RLTI) that occur per year, RLTI severity and RLTI frequency. An RLTI is defined as an injury that takes place at work, and results in the worker being unable to return to work and carry out their duties for a period of time. The RLTI frequency and RLTI severity are both based on 100 full-time workers (100 FTE = 200,000 hours worked).

$$RLTI \text{ frequency} = 200,000 \text{ hrs} \times \frac{\# \text{ of lost time injuries}}{\text{person hours worked}}$$

$$RLTI \text{ severity} = 200,000 \text{ hrs} \times \frac{\# \text{ of working days lost}}{\text{person hours worked}}$$

Data on RLTI, RLTI Frequency and RLTI Severity since 2019 is included in Table 3 below.

Table 3: Recordable lost-time injuries (RLTI), frequency and severity at WL

Year	RLTIs	RLTI Frequency	RLTI Severity
2019	0	0	0
2020	1	0.34	0.68
2021	0	0	0
2022	0	0	0
2023	4	1.04	6.50

There was an increase in RLTI in 2023 at WL, however, CNL reported that these were not related to the WL site safety stand-down in 2023 resulting from fire protection program deficiencies. Other RLTIs involved slips on ice, spraining of a worker's ankle during a security training exercise and an injury while a worker was physically training on-site. CNL staff have reviewed the reported RLTIs and do not have any concerns.

4.8.3.2 Regulatory Focus

CNSC staff continue to monitor CNL's performance in this SCA through regulatory oversight activities including onsite inspections and desktop reviews of relevant program documentation. The current regulatory focus during compliance activities will be the effectiveness of pre-job briefs and the integrated work control process.

CNSC staff continue to focus on regulatory oversight in this area as decommissioning and demolition activities are planned by CNL. As the CNL occupational health and safety program is updated, CNSC staff conduct desktop reviews to ensure regulatory requirements continue to be met.

4.8.3.3 Proposed Improvements

No improvements to this SCA are proposed.

4.8.4 Conclusion

There are no challenges with CNL's implementation of this SCA. CNSC staff concluded that CNL has effectively managed workplace safety hazards at WL. Compliance verification activities will continue to be conducted at the facility to confirm that CNL's WL continues to view conventional health and safety as an important consideration.

Based on CNSC staff assessments of CNL's application, supporting documents and past performance, CNSC staff concluded that CNL's conventional health and safety program and implementation continue to be effective, meet applicable regulatory requirements, and are rated as satisfactory.

4.9 Environmental Protection

The Environmental Protection SCA covers programs that identify, control and monitor all releases of radioactive nuclear and hazardous substances and their effects on the environment from facilities or as a result of licensed activities.

The following specific areas are included in this SCA:

- Environmental risk assessment
- Effluent and emissions control (releases)
- Assessment and monitoring
- Protection of people
- Environmental management system (EMS)

4.9.2 Trends

The following table indicates the overall rating trends for the Environmental Protection SCA over the current licensing period:

TRENDS FOR ENVIRONMENTAL PROTECTION:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA ¹
<p style="text-align: center;">Comments</p> <p>For the years 2019 to 2022, WL was consistently rated as satisfactory (SA) for the Environmental Protection SCA. These ratings were reported in CMD 23-M30, <i>Regulatory Oversight Report for Canadian Nuclear Laboratories sites: 2022</i> [31].</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, <i>Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018</i> [10].</p> <p>CNSC staff conclude that CNL's Environmental Protection performance meets CNSC's regulatory requirements.</p> <p>¹ At the time of writing this CMD, CNSC staff have provided an initial performance rating of SA based on 2023 data obtained. CNSC staff did not have all the required data to provide a final assessment of CNL's performance in the Environmental Protection SCA for 2023. The required reports from CNL to complete a full assessment are submitted later in the 2024 calendar year per the WL licence and require time to review. An update with CNSC staff's confirmation and final assessment of CNL's performance in this SCA will be provided during the presentation of the CMD in October 2024, once CNL staff have completed a review of the submitted CNL reports. CNSC staff will also provide a final assessment of WL's performance in the 2023 calendar year as part of the 2024 CNL Regulatory Oversight Report.</p>				

4.9.3 Discussion

The framework for the WL Environmental Protection Program (EPP) [32] is provided by its Integrated Environmental Monitoring Program [33]. The WL EPP was designed and implemented per [REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* \(2017\)](#), as well as the CSA Group's environmental protection standards outlined under the Environmental Protection SCA in Appendix B.3. The WL Comprehensive Study Report (CSR) [29] and the site's dose model within the Derived Release Limits (DRL) document [38] form the basis of their EPP. The conclusions from the CSR and DRL documents were used to design and update the environmental monitoring program and provide recommendations for further work required to refine the site's environmental risk.

The WL Integrated Environmental Monitoring Program [36] achieves 3 main tasks:

- monitor direct releases to the environment
- monitor contaminant pathways
- monitor biological effects as applicable to all individual monitoring

The WL Integrated Environmental Monitoring Program [36] consists of 3 distinct programs: their Effluent Verification Monitoring Program (EVMP), Environmental Monitoring Program (EMP), and Groundwater Monitoring Program (GWMP). The WL EVMP, EMP and GWMP align and comply with the following associated CSA Standard principles:

- CSA N288.1-14, *Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities* [47]
- CSA N294-09 (reaffirmed 2014), *Decommissioning of Facilities Containing Nuclear Substances* [48]
- CSA N288.4-10, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [49]
- CSA N288.5-11, *Effluent Monitoring Program at Class I Nuclear Facilities and Uranium Mines and Mills* [50]
- CSA N288.6-12, *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills* [51]
- CSA N288.7-15, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [52]
- CSA N288.8-17, *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities* [53]
- CNSC REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* (2017)

CNL has established derived release limits (DRLs) [34] and action levels [35] for WL to ensure that radioactive releases from their facility's operations would not exceed the established regulatory public dose limit of 1 mSv/yr and to ensure that the public and environment are protected.

During the current licence period, CNSC staff verified CNL's performance with respect to environmental protection through inspections and desktop reviews.

The CNSC implemented its Independent Environmental Monitoring Program (IEMP) as an additional verification that Indigenous Nations and communities, the public and the environment around licensed nuclear facilities are protected. This program is complementary to CNSC's ongoing compliance verification activities and involves CNSC staff taking samples from publicly accessible areas around the facilities and analyzing the quantities of nuclear and hazardous substances in those samples at the CNSC laboratory.

The IEMP results from the 2022 IEMP campaign around WL show the levels of nuclear substances in all samples were below available guidelines, below CNSC screening levels and were similar in range to the results in the 2017 IEMP campaign around WL. These results indicate that people and the environment in the vicinity of WL are protected and that there are no health impacts. The IEMP results for WL are published on the CNSC's [website](#).

Additional information on the IEMP at WL is presented in Appendix F, Environmental Protection Review Report of this CMD.

4.9.4 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.9.4.1 Past Performance

Environmental Risk Assessment

An ERA of nuclear facilities is a systematic process used by licensees to identify, quantify, and characterize the risk posed by contaminants and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with a facility or site. The ERA serves as the basis for the development of site-specific EP control measures and EMPs. ERAs include an ecological risk assessment (EcoRA) and a human health risk assessment (HHRA) for radiological and hazardous contaminants and physical stressors. The results of these programs and assessments, in turn, inform and refine future revisions of the ERA.

Under [REGDOC 2.9.1, *Environmental Principles, Assessment and Protection Measures*](#) and CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* [51], CNL is required to establish and maintain a site-wide ERA for WL. For this licensing period, WL's Comprehensive Study Report (CSR) [29] was used to inform the WL site EP measures. It should be noted that WL's CSR pre-dates CSA N288.6-12, and as such, is not considered compliant with the standard.

The WL site is required to implement the requirements of CSA N288.6-12 commencing in January 2020 for the first time; therefore, the WL site is in progress to fully implement the requirements of this standard. In November 2019, CNSC staff requested CNL to provide a date for when the required site-wide ERA would be submitted for review and acceptance, to which CNL committed to submitting the ERA for September 2022.

In May 2021, CNL submitted to the CNSC an ERA for the WL Lagoon and Landfill areas at the request of CNSC staff. This ERA is a specific ERA to support and inform the final end-states of the WL Lagoon and Landfill areas. CNSC staff reviewed the ERA and provided comments for CNL to address in October 2021. CNSC staff review findings of the Lagoon and Landfill ERA were of low safety significance to the environment and public. The comments provided to CNL are requests for additional information and clarification to be provided.

CNL informed CNSC staff that submission of the site-wide ERA would be delayed to February 2023 and again to May 2023. CNL procured a contractor to conduct the site-wide ERA and cited that the delays were due to its contractor requiring additional time to address CNL comments and to incorporate changes in consideration of CNSC staff's comments made on the Lagoon and Landfill ERA.

On May 31, 2023, CNL submitted the required WL site-wide ERA to CNSC staff for review and acceptance per CSA N288.6-12. This ERA covers current operational activities for the WL site. CNSC and Environment and Climate Change Canada (ECCC) staff reviewed the site-wide ERA, provided comments for CNL to address and requested a resubmission of a revised site-wide ERA. The comments provided by CNSC staff do not challenge the site-wide ERA's overall conclusions about WL's environmental safety and are intended for CNL to clarify and justify information. CNL will resubmit a revised site-wide ERA for CNSC staff acceptance prior to the licence hearing in October 2024. CNSC staff will provide an update on CNL's site-wide ERA during the presentation of the CMD in October 2024.

Upon CNSC staff's acceptance of CNL's site-wide ERA, this EPR report will be revised to include an assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities at the WL site. CNL WL will have fully implemented CSA N288.6-12 upon CNSC staff's acceptance of its site-wide ERA.

CNSC staff's review to date of the submitted site-wide ERA, annual compliance reports, CNSC Independent Environmental Monitoring Program results and other environmental monitoring programs, indicate that there is low risk to the environment.

CNSC staff conclude that there are adequate measures to protect members of the public and/or Indigenous Nations and communities from legacy contamination and operational activities on the WL site.

Effluent and emissions control (releases)

CNL has implemented and maintains an Effluent Verification Monitoring Program (EVMP) at WL which includes monitoring both nuclear and hazardous substance emissions. CNL's EVMP provides site-specific details on the execution of the program, monitoring details, and the rationale behind the current monitoring schedule.

As per CNSC reporting requirements, CNL submits its EVMP results in an annual report to confirm compliance with applicable regulations and CNSC staff review and assess the monitoring results.

Table 4 and Table 5 below present the minimum and maximum annual releases of tritium, gross beta particulates (Cs-137), and gross alpha particulates (Pu-239) to air and water from WL between 2016 and 2022. The results show that releases were well below regulatory release limits.

Table 4: Annual radiological releases to air from WL from 2016-2022
[34][36][37][38]

Parameter	Releases (range Min to Max) (Bq/yr)	Derived Release limits (Bq/yr)	
		2016 ¹ - 2019	2020 ² -2022
Tritium	1.31E+10 – 5.04E+10	8.58E+16	8.58E+16
Gross Beta Particulates (Cs-137)	1.70E+05 – 3.27E+05	3.60E+11	7.70E+11
Gross Alpha Particulates (Pu-239)	8.39E+03 – 1.00E+05	9.00E+10	9.00E+10

¹ Derived release limits were revised in 2016 to meet CSA N288.1-08.

² Derived release limits were revised in 2020 to include tritium releases from new waste management area systems.

Table 5: Annual radiological releases to water from WL from 2016-2022
[34][36][37][38]

Parameter	Releases (range Min to Max) (Bq/yr)	Release limits (Bq/yr)	
		2016 ¹ -2019	2020 ² -2022
Gross Alpha ³	2.69E+07 – 6.67E+07	1.33E+10	6.03E+10
Sr-90	1.03E+07 – 6.67E+07	1.56E+11	1.56E+11
Cs-137	8.36E+06 – 1.89E+07	1.39E+11	1.39E+11
Tritium	4.18E+06 – 5.96E+09	8.16E+14	8.16E+14

¹ Derived release limits were revised in 2016 to meet CSA N288.1-08

² Derived release limits were revised in 2020 to include tritium releases from new waste management area systems

³ The Gross Alpha parameter release limits for 2016-2019 used the Am-241 value since this was identified as the most restrictive radionuclide in their Derived Release Limit document; the Gross Alpha parameter release limits for 2020-2022 used the Pu-238 value since this was identified as the most restrictive radionuclide in their updated Derived Release Limit document

CNSC staff have reviewed WL effluent monitoring results, including results from the licence period beginning in 2020 and concluded that:

- monitoring results for airborne emissions and waterborne effluent were well below regulatory limits and did not indicate any significant dose contributions from WL operations.
- nuclear and hazardous substances in liquid effluent discharged to the Winnipeg River remained well below WL licence limits; discharges at these low levels would not pose a concern to people or to the health of the Winnipeg River's ecosystem.

Based on the reviews and assessments of CNL's EVMP results, CNSC staff concluded that the current WL EVMP continues to protect the public and the environment.

Assessment and Monitoring

CNL has implemented an EMP for WL that includes monitoring nuclear and hazardous substances in the environment and the purpose of CNL's EMP is to:

- measure contaminants in environmental media around the facility or site
- determine the effects, if any, of the facility or site operations on people and the environment
- serve as a secondary support to effluent and emission monitoring programs to demonstrate the effectiveness of emission controls

The WL EMP consists of monitoring the following components:

- ambient air
- air emissions
- wet/dry deposition
- soil
- surface water
- groundwater
- site intake water
- liquid effluent
- gamma radiation
- sediment
- vegetation and garden crop
- wildlife (radionuclides in flesh and bone)
- fish (radionuclides in flesh)
- noise

CNSC staff have reviewed the WL environmental monitoring results [39][40][41][42] including results from the licence period beginning in 2020 and conclude that:

- surface water monitoring of several drainage ditch locations around Whiteshell shows that levels of gross beta, gross alpha, and tritium are well below [Health Canada's Guidelines for Canadian Drinking Water](#) and are similar to monitoring values from different sampling years.
- vegetation monitoring at Whiteshell shows gross beta values are similar across sampling years and are within the same magnitude of background and control samples.

- based on compliance activities and technical assessments, CNSC staff have found that CNL is compliant with REGDOC-2.9.1 and continues to implement and maintain an effective EMP for WL that adequately protects the environment and the health and safety of people

Based on review and assessment of CNL's environmental monitoring results at WL, CNSC staff conclude that the WL EMP continues to protect the public and the environment.

Protection of People

Within the Environmental Protection SCA, the protection of people helps ensure that members of the public are not exposed to "unreasonable" risk with respect to hazardous substances discharged from nuclear facilities.

Between 2019 and 2023, there were 2 reportable events related to the Environmental Protection SCA for WL:

- June 10, 2021 – Hydraulic fluid spill
- January 12, 2023 – Process Outfall Effluent Exceeded WL Action Level (300 µg/L) for Manganese

In June 2021, CNL reported that at the Active Liquid Waste Treatment Centre demolition site a forklift leaked hydraulic fluid due to a mechanical failure. Approximately 160 litres of fluid was released into the immediate environment. CNL promptly took the forklift out of service, and the spill was contained using absorbent material. CNL subsequently serviced the forklift and the contaminated material was disposed of. CNL completed the remediation of the contaminated area and CNSC staff were satisfied with CNL's corrective actions. CNSC staff determined that given the localized extent of the event and the measures taken by CNL, the safety significance to the environment and public is negligible.

In January 2023, CNL reported that it exceeded the environmental release action level at the WL process outfall for Manganese from July 2022 to October 2022. This was caused by run-off of sediment on roadways which were not cleaned, where soil in the area normally has elevated levels of Manganese. CNL took immediate corrective actions by performing a clean-up campaign of roadways and improving the process for analyzing, reviewing data and communicating exceedances. CNSC staff are satisfied with CNL's corrective actions after follow-ups and desktop reviews. CNSC staff determined that this event was of negligible safety significance and impact on the environment and public.

Between 2019 and 2023, the total estimated dose for a member of the public from radioactivity from emissions and effluents discharged from WL was between 2.90×10^{-6} and 5.9×10^{-5} mSv/yr [45] [74]. These values are consistently well below the regulatory dose limit of 1 mSv/yr, which is the public dose limit in the *Radiation Protection Regulations*. This shows the risk to the public from WL's operations remains low. Table 6 provides annual data for the estimated effective dose to the public between 2019 and 2023. Release data for facilities is available on the [CNSC Open Government Portal](#).

Table 6: Estimated annual effective dose to a member of the public from WL operations, 2019-2023 [43][45][74]

Dose data	2019	2020	2021	2022	2023	Regulatory dose limit
Annual effective dose (mSv)	8.70E-05	2.90E-06	1.10E-05	2.1E-05	5.9E-05	1 mSv/year

CNSC staff have reviewed the results of non-radiological hazardous substance monitoring from WL and conclude that:

- the levels of non-radiological hazardous substances released to air from WL have reduced significantly since the replacement of their building heating fuel in 2013.
- overall, airborne emissions remained below the National Pollutant Release Inventory (NPRI) reporting threshold [44]; the exception was for particulate matter (PM10 & PM2.5) which has been attributed to increased dust from building demolition and excavation projects and particulate matter values been reported to the NPRI.
- the levels of hazardous substances released in liquid effluent from WL have consistently been well below their limits.
- greenhouse gas (GHG) emissions from WL have consistently been below Environment Climate Change Canada's (ECCC) GHG emissions threshold; WL continues to monitor their GHG emissions and reports GHG emissions in their Annual Compliance Monitoring Report.

Environmental Management System (EMS)

CNL has established and implemented an EMS for WL that meets CNSC requirements outlined in [REGDOC 2.9.1, *Environmental Principles, Assessment and Protection Measures*](#). The WL EMS assesses environmental risks associated with nuclear activities to ensure their operational activities are conducted in a way that prevents and mitigates adverse environmental effects. CNL's EMS is registered and certified under the International Standards Organization (ISO) 14001:2004 Standard, Environmental Management Systems – Requirements with Guidance for Use. During inspections and desktop reviews, CNSC staff review CNL's annual internal audits, management reviews, and environmental goals, targets, and objectives to ensure compliance with REGDOC-2.9.1 (2017). The results of these reviews demonstrate that CNL's EMS for WL meets CNSC requirements as outlined in REGDOC-2.9.1 (2017).

4.9.4.2 Regulatory Focus

CNSC staff will continue to monitor and evaluate CNL WL Environmental Protection performance through regulatory oversight activities including onsite inspections and desktop reviews of relevant environmental protection program documents.

CNSC staff will also perform desktop reviews of CNL's submissions of gap analyses and implementation plans for the implementation of updated standards/regulatory requirements applicable to the Environmental Protection SCA.

These updated standards and regulatory requirements are below in subsection 4.9.4.3.

4.9.4.3 Proposed Improvements

Over the next licence period, CNSC staff expect CNL to implement the updated standards/regulatory requirements applicable to the Environmental Protection SCA to improve the WL Environmental Protection Program:

- [REGDOC-2.9.2, *Controlling Releases to the Environment*](#)
- CSA N288.0-22, *Environmental management of nuclear facilities: Common requirements of the CSA N288 series of Standards* [68]
- CSA N288.1-20, *Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities* [69]
- CSA N288.4-19, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [70]
- CSA N288.5-22, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [71]

- CSA N288.6-22, *Environmental risk assessment at Class I nuclear facilities and uranium mines and mills* [72]
- CSA N288.7-23, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [73]

CNL has notified CNSC staff of planned submission dates for implementation plans and gap analyses and implementation dates for the above standards except for [REGDOC-2.9.2](#) and CSA N288.7-23, to which CNSC staff reviewed and accepted. CNSC staff will be formally requesting implementation plans and gap analyses for REGDOC 2-9.2 and CSA N288.7-23 during the next proposed licence term.

4.9.5 Conclusion

Based on CNSC staff's assessments of CNL's Integrated Environmental Monitoring Program at WL, CNL's licensing application, supporting documentation and past performance in the Environmental Protection SCA, CNSC staff conclude that there are no concerns related to the protection of the public or the environment. A site-specific ERA for WL is required to be updated every 5 years or earlier if there are significant operational changes. The site-wide ERA is being revised by CNL and CNSC staff will review the updated site-wide ERA for acceptance. CNSC staff will provide an update on CNL's site-wide ERA during the presentation of the CMD. CNSC staff conclude that CNL continues to maintain and implement an effective Environmental Protection Program at WL.

4.10 Emergency Management and Fire Protection

The Emergency Management and Fire Protection (EMFP) SCA covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions.

The specific areas that comprise this SCA at the WL site include:

- Conventional emergency preparedness and response;
- Nuclear emergency preparedness and response; and
- Fire emergency preparedness and response.

4.10.1 Trends

The following table indicates the overall rating trends for the EMFP SCA over the current licensing period:

TRENDS FOR EMERGENCY MANAGEMENT AND FIRE PROTECTION:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	BE	BE
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>The overall compliance rating for 2023 is Below Expectations in continuation from 2022. CNL WL is in a phased site safety stand-down and is working towards full operations upon completing the necessary corrective actions in a site multi-phase restart plan. CNSC staff continue to perform compliance oversight and reviews at regulatory hold-points prior to authorizing CNL to move through the defined restart phases.</p>				

4.10.2 Discussion

The EMFP SCA covers emergency plans and emergency preparedness programs that exist in case of emergencies and for non-routine conditions. This area also includes any results of participation in exercises. CNL maintains an emergency preparedness program at WL to address and respond to emergencies both onsite and offsite, and events that can affect the facility throughout the current licence period. For this current licence period, CNL is required to comply with CNSC [REGDOC-2.10.1: Nuclear emergency preparedness and response](#) and CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* standard [55]. CNSC staff have verified that CNL implements an emergency response plan through its *Whiteshell Laboratories Emergency Response Plan*, (WL-508730-PLA-001591) [54]. The approach to Emergency Preparedness and Fire Protection for the WL site is based on a combination of detailed planning and hazard identification and risk assessments at all facilities.

This SCA also includes the implementation of a fire protection program (FPP) to prevent or minimize the risk that fire poses to the health and safety of persons and the environment, through appropriate fire protection system design, fire-safe operation and fire prevention.

CNL WL's FPP was established to comply with the CSA N393-13 and aims to minimize both the probability of occurrence and the consequences of fire at the facility.

CNSC staff assess CNL's performance in the emergency management and fire protection SCA through desktop reviews of documents, reportable events and through the course of inspections including drills and emergency exercises conducted in partnership with emergency services in local municipalities.

4.10.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.10.3.1 Past Performance

Conventional and Nuclear Emergency Preparedness and Response

On August 6, 2019, CNSC staff conducted an inspection focusing on evaluating the WL's physical operations and safety measures, including radiological and emergency protocols. The inspection involved observing planned exercises, such as a propane leak exercise, to test personnel response to hazardous emergencies. CNSC staff issued 2 NNCs to CNL to correct following the inspection. The first notice concerns the marking and annual maintenance of breathing apparatus air cylinders, while the second addresses the repair of a damaged fire door to ensure compliance with safety standards. Overall, CNSC staff found that CNL maintained the site and conducted activities according to inspection criteria. CNL satisfactorily implemented corrective actions which CNSC staff reviewed and accepted.

CNSC staff performed a general inspection at WL that covered several SCAs in September 2021, including the Emergency Management and Fire Protection SCA. CNSC staff issued 1 notice of non-compliance (NNC) under the Emergency Management and Fire Protection SCA for CNL to implement a corrective action plan to align emergency procedure documentation with program requirements. CNSC staff determined that the safety risk from this NNC to be negligible. CNL submitted a revised site wide emergency response plan and CNSC staff determined it to be acceptable.

CNL submitted a revised Whiteshell Laboratories Site Emergency Response Plan (WL-508730-PLA-001591) [54] in March 2023. The plan replaces a previous document and incorporates updates reflecting changes to the site and the Officer-In-Charge program. CNL met prior notification requirements for the submission. CNSC staff reviewed the submission and requested confirmation that changes to the Officer-in-Charge program align with relevant regulations, which CNL provided. CNSC staff were satisfied with CNL's response and had no further comments.

Fire Emergency Preparedness and Response

In April 2023, CNL conducted a self-assessment of its fire protection program at the WL site, finding deficiencies in training records for on-site fire brigade members and incomplete equipment procedures. Consequently, CNL reported the event to the CNSC, leading to a shutdown of non-essential activities. This stand-down and CNL's past performance concerning the Fire Emergency Preparedness and Response specific area is discussed in subsection 2.3.

4.10.3.2 Regulatory Focus

CNL has not met regulatory requirements for its fire protection program in 2023. As mentioned in earlier in subsection 2.3, the WL site is in a safety stand-down and CNL is working to progress to normal operations in a risk-defined manner through a multi-phase recovery plan by implementing root cause analysis corrective actions and the effectiveness of them. CNSC staff continue to perform regulatory oversight of CNL's multi-phase recovery plan activities including holding bi-weekly meetings with CNL on the matter and reviewing CNL's readiness submission packages to determine acceptability for CNL WL to move to the next subsequent phases.

In response to the identification of the WL Fire Response non-compliance event in 2023, discussed in section 2.3, CNSC staff developed a WL-focused compliance verification plan.

This plan is intended to define CNSC staff's compliance verification activities with added increased regulatory scrutiny. CNSC staff define this as increasing regulatory oversight of a particular facility or licensed activity beyond established baseline compliance verification activities. CNSC staff's increased regulatory scrutiny under the WL-focused compliance verification plan includes:

- Increased scope and/or frequency of inspections.
- Increased reporting requirements.
- Increased frequency of meetings between CNSC staff and the licensee.
- Additional document reviews.

As part of CNSC staff's compliance verification planning process, this plan is based on the ongoing review of previous licensee compliance findings, information on CNL WL site operations and activities and CNSC staff's existing 10-year baseline compliance plan for the WL site.

CNSC staff have increased regulatory scrutiny of compliance activities from the WL baseline inspection plan of 3 inspections for the fiscal year 2023-2024 with an additional 4 reactive inspections conducted since March 2023 covering the Emergency Management Fire Protection, Management System and Human Performance Management SCAs. CNSC staff have developed a focused compliance plan for WL to ensure that CNL has satisfactorily implemented recovery plan RCA actions and verifying their effectiveness through a series of inspections.

As per CSA N393-13, CNL is required to have fire protection assessment documents, including fire hazard analysis and code compliance reviews) be updated or confirmed at least once every 5 years to reflect nuclear facility modifications, any significant changes in fire hazards, operating experience, and operational changes. CNSC staff have found that CNL has not demonstrated this and will increase regulatory oversight for this licence requirement for the maintenance of CNL's Fire Protection assessment via compliance plan inspections and licensing actions through the proposed LCH.

CNSC staff will continue regulatory oversight and conduct increased regulatory scrutiny of CNL's performance in the Emergency Management and Fire Protection SCA through a targeted compliance plan that includes regulatory oversight activities such as onsite inspections, desktop reviews of quarterly and annual compliance reports, desktop reviews of third-party reports, and desktop reviews of revisions to relevant program documentation under this SCA.

4.10.3.3 Proposed Improvements

CSA N393-22, *Fire protection for facilities that process, handle, or store nuclear substances*, published in September 2022 [57] will apply to WL operations. CNL submitted an implementation plan and gap analysis for CNSC staff review on May 31, 2024, detailing when compliance with the 2022 edition of the CSA standard will be implemented at WL. At the time of writing this CMD, CNSC staff are reviewing the gap analysis and implementation plan and will respond to CNL regarding its adequacy by mid-2024.

The current and proposed licence condition 10.1 and 10.2 requires CNL to implement and maintain an emergency preparedness program and fire protection program. Compliance verification criteria for this licence condition are included in the draft LCH in part 2 of this CMD. CNSC staff are proposing to add CNL WL fire protection assessment documents, which include fire hazard assessments and code compliance reviews, and CNL's Whiteshell Staffing, Equipment and Apparatus document as licensee notification of change documents to licence condition 10.2 that require CNSC staff approval before implementation.

4.10.4 Conclusion

As a result of these findings, CNSC staff has rated the Emergency Management and Fire protection SCA at WL as Below Expectations in 2022 and 2023. CNSC staff will increase monitoring and compliance activities to confirm the effectiveness of the Fire Protection program implemented at the WL site under a WL focused compliance verification plan. CNSC staff will continue to oversee this area to ensure WL returns to full and sustainable compliance with regulatory requirements.

Overall, based on the reduced site operations resulting from the site wide stand-down and CNL's risk-based graduated phases of operation for the WL site towards full normal operations, which requires CNSC staff acceptance, CNSC staff determined that the risk to the health or safety of persons or impact on the environment from the fire protection program event as low.

Despite CNL's performance rating being below expectations for the Emergency Management and Fire Protection SCA, CNSC staff concluded that CNL is qualified to carry out the authorized activities at WL under this SCA. CNL has made progress through its multi-phase recovery plan and implementing corrective measures to safely increase the activities conducted at site in a risk-based manner. CNSC staff have been satisfied with CNL's submissions and progress made to date related to the WL site's recovery plan.

4.11 Waste Management

The Waste Management SCA covers internal waste-related programs that form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This SCA also covers the planning for decommissioning.

The specific areas that comprise this SCA at the WL site includes:

- Waste characterization
- Waste minimization
- Waste management practices
- Decommissioning plans

4.11.1 Trends

The following table indicates the overall rating trends for the Waste Management SCA over the current licensing period:

TRENDS FOR WASTE MANAGEMENT:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL continues to be rated SA for their waste management performance at WL. CNSC staff conclude CNL's Waste Management performance meets performance objectives and applicable regulatory requirements.</p>				

4.11.2 Discussion

The Waste Management SCA includes a waste management program and a plan for the decommissioning of the WL site. CNL has implemented and maintains a waste management program that documents the activities to control the safe management of radioactive waste during all steps of its management. CNL's waste management program currently meets the requirements of [REGDOC 2.11.1 Waste Management, Volume I: Management of Radioactive Waste](#) and the CSA Group's standards outlined under the Waste Management SCA in Appendix B.3. CNL prepared a program overview decommissioning plan that describes the decommissioning strategy and final end-state plan. CNL has also implemented and maintains a decommissioning program.

The singular focus of CNL at the WL site has been the decommissioning and demolition of redundant structures on the site, all of which generate waste activities. CNSC staff recommendations related to this SCA did not consider the proposed *in-situ* decommissioning (ISD) of the WR-1 reactor. Any proposed activities specifically related to the proposed ISD of WR1 are out of the scope of this application and will be considered by the commission in a separate hearing.

CNSC staff have evaluated CNL's compliance through oversight activities such as desktop reviews and compliance inspections. CNSC staff conclude that CNL's Waste Management SCA at the WL site meets all applicable regulatory requirements.

4.11.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.11.3.1 Past Performance

Under CNL's waste management program at the WL site, waste is generated from operational activities and decommissioning projects. Associated with their waste management program, CNL is segregating, packaging, storing and reusing or recycling radioactive, hazardous and conventional wastes.

Waste Characterization and Waste Minimization

CNL maintains a waste management program to control and minimize the volume of all waste streams generated from licensed activities. Wastes generated at WL are radiologically screened and segregated at the source as either "Likely Clean" or "Radiological Contaminated". Likely Clean waste is monitored for radiological clearance. If the waste is confirmed clean (i.e. not radiologically contaminated), the waste is either reused or recycled where possible, directed to an off-site landfill, or transferred to an appropriate off-site licensed storage or disposal facility for hazardous material. Radiologically contaminated waste is decontaminated to meet clearance criteria where feasible or characterized and sent to the WL Waste Management Area (WMA), as well as shipped to CRL for disposition.

CNSC staff confirmed through on-site inspections that CNL continues to characterize and minimize waste at the various steps in the management of radioactive waste to meet the acceptance criteria of the receiver. CNSC staff verify licensee compliance with waste segregation and labelling requirements at the WL site as a standard part of site inspections.

Waste Management Practices

The WMA provides processing and storage facilities for radioactive waste. It consists of the Shielded Modular Above Ground Storage (SMAGS) building which is in the process of being converted to a Cask Loading Facility (CLF), bunkers and Quonset buildings used to store low-level waste (LLW) and intermediate-level waste (ILW) generated from WL decommissioning activities. CNL conducts projects to re-characterize radioactive waste as necessary and to assess waste conditions, environmental conditions and potential environmental impacts. CNL performs inspections of WMA to confirm waste is stored safely.

CNL is executing the decommissioning of the WMA following detailed decommissioning plans. This work includes improving access to the area, reducing and repackaging existing waste, and preparing facilities to be decommissioned. The detailed decommissioning plans include the proposed waste management practices that are evaluated and approved by CNSC staff. Following the completion of the decommissioning of a building or a location on site, CNL is required to submit a post-decommissioning report called the end-state report for CNSC staff review. This report is reviewed by CNSC staff to verify the licensee's compliance with the approved plans.

Some of the WL decommissioning activities that have been conducted by CNL at the WMA since the last licensing renewal in 2019 (CMD 19-H4) [58] are listed below:

- Work to prepare for the extraction of the waste from ILW bunkers and standpipes began in 2017 and continues into 2023 with the progress of off-site fabrication of standpipe/bunker remediation equipment.
- In 2020, CNL completed the removal of all legacy wastes stored in the SMAGs (Building 923) and waste was transported to CRL for interim storage. The SMAG will be converted into a Cask Loading Facility. The Cask Loading Facility will be used to handle, stage, and load waste into appropriate shipping packages for transportation offsite.
- CNL also prepared a Recoverable Surface Storage and Staging Area (RSSSA) consisting of an outdoor, above-ground storage pad to enable the storage and loading of solid low-level waste in sea-can containers and storage of oversized low-level waste items awaiting further processing, characterization and/or packaging before off-site disposition. The RSSSA, located within the WL WMA, was placed into service in early 2022.
- Completion of the removal of contaminated soil from the Soil Storage Compound with waste packaged and shipped to CRL for disposition.
- Work is ongoing to remove, characterize, and repackage LLW from storage facilities in the waste management area and shipment to CRL for interim storage.

CNSC staff conducted a WMA facility focused inspection in 2022 and 2 NNCs under the Waste Management SCA of low-safety significance were issued to CNL. The first NNC issued pertained to a waste container label non-compliance and the second NNC pertained to an incomplete site-wide waste inventory. CNSC staff have determined the 2 NNCs to be of low safety risk to the environment and public. CNSC staff reviewed CNL's corrective action for the first NNC and determined it to be acceptable. CNL is expected to respond to the second NNC regarding the waste inventory by August 2024. CNSC staff will review CNL's response once submitted for adequacy and acceptance.

CNSC staff have evaluated CNL's compliance through oversight activities such as desktop reviews and compliance inspections. CNSC staff are satisfied that CNL is carrying out waste management practices and decommissioning work per the licensing basis.

CNSC staff will continue to monitor performance in this area through regulatory oversight activities including inspections and desktop reviews of CNL's compliance reporting and revisions to relevant program documentation pertaining to this SCA.

Decommissioning Plans

CNL is actively engaged in planning, preparing for, executing, and completing decommissioning activities at the WL site. This process follows the steps outlines in CNL's detailed decommissioning plans.

CNL's planning encompasses all nuclear and non-nuclear facilities at the site. These comprehensive decommissioning plans are submitted to CNSC staff for acceptance as a twelve-volume series. Volume 1 serves as the program overview document, outlining the overall decommissioning strategy for the site and providing a general overview of individual facilities. Subsequent volumes are submitted separately to CNSC staff as detailed decommissioning plans for each specific facility on the WL site. Not all volumes of the detailed decommissioning plan have been developed yet. They are created as needed by CNL as the decommissioning of WL progresses.

During the licensing period, the following detailed decommissioning plans were reviewed and accepted by CNSC staff:

- Whiteshell Laboratories Detailed Decommissioning Plan: Volume 1 - Program Overview, Revision 2
- Whiteshell Laboratories Detailed Decommissioning Plan: Volume 11 Health and Safety Buildings 402 and 305. Revision 2
- Whiteshell Laboratories Detailed Decommissioning Plan: Volume 8 - WMA: Part 3 – Low-Level Waste Liabilities, Revision 5

CNSC staff also reviewed Whiteshell Laboratories Detailed Decommissioning Plan Volume 6 – Whiteshell Reactor #1: Building 100. CNSC staff provided comments to CNL and are currently awaiting additional information and development of the WR-1 ISD safety case. This proposal is out of the scope of this application and will be considered by the Commission in a separate hearing.

In March 2022, CNL conducted a gap analysis and implementation plan for [REGDOC 2.11.2, Decommissioning](#) and CSA N294.0-19 *Decommissioning of facilities containing nuclear substances* [59]. CNL proposes to revise and submit, as per the 5-year review cycles, the following DDPs by March 2025 for CNSC staff review and approval: DDP Volumes 1 - Program Overview, Volume 2 - Shielded Facilities, Volume 9 – Building 300, and Volume 12 - Licensed Site Supporting and General Infrastructure, Part 5: Site Affected Lands and Contaminated Structure.

4.11.3.2 Regulatory Focus

As outlined in Record of Decision 19-H4 item 13 [28], CNL was to submit a safety case for the LLW trenches in the WMA by the end of 2023. The proposal for *in-situ* decommissioning of 21 of 25 LLW trenches was originally presented in WL's Comprehensive Study Report (CSR) [29]. CNL is currently evaluating other options, including remediation of the contents of the trenches and assessment of the surrounding soils as opposed to in-situ decommissioning. Work to characterize the waste in the LLW trenches has been on pause due to the phased site safety stand-down in 2023, CNL expects this work to resume once approved to begin low risk work on site. Should there be a change in the decommissioning strategy for the LLW trenches, a revised DDP (and associated safety case, if applicable) will be submitted to CNSC staff for review and approval.

CNSC staff will continue to carry out verification activities as CNL conducts decommissioning activities at the WL site. CNSC staff will continue to monitor CNL's performance in this SCA through compliance verification activities including onsite inspections and desktop reviews of relevant program documentation. This SCA will remain an area of focus in the next licensing period, as CNL continues to pursue decommissioning activities generating radioactive waste that must be stored and managed at the WL site.

4.11.3.3 Proposed Improvements

In July 2023, CNSC staff requested that CNL submit a gap analysis and implementation plan for a new CSA standard N292.8-21 *Characterization of radioactive waste and irradiated fuel* [60].

In the submitted gap analysis and implementation plan, CNL committed to revise and implement waste characterization program documentation for all CNL facilities, including WL, by March 2026. CNSC staff reviewed and accepted CNL's submitted gap analysis and implementation plan for CSA N292.8-21 and the committed implementation date.

CNSC staff will revise the WL licence conditions handbook to include the new CSA N292.8-21 standard once CNL confirms completion of the implementation actions.

4.11.4 Conclusion

Based on CNSC staff assessment of CNL's application, supporting documents and past performance, CNSC staff conclude that CNL continues to implement and maintain an effective waste management program at the WL following regulatory requirements.

4.12 Security

The Security SCA covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.

The specific areas that comprise this SCA at the WL site include:

- Facilities and equipment
- Response arrangements
- Security practices
- Drills and exercises

4.12.1 Trends

The following table indicates the overall rating trends for the Security SCA over the current licensing period:

TRENDS FOR SECURITY:				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
BE	BE	BE	SA	SA
<p style="text-align: center;">Comments</p> <p>In 2017, CNSC staff identified deficiencies in the security arrangements at the WL site that led to enforcement actions, including an Order (Order #9336). This Order required CNL to demonstrate that WL is capable of making an effective intervention to stop an adversary from committing theft or sabotage.</p> <p>Subsequently, the security program at WL was assessed BE in the 2018, 2019, 2020 and 2021 calendar years. CNL implemented the required corrective actions to meet SA performance ratings in 2022 and 2023.</p> <p>The ratings for 2014 to 2018 were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p>				

4.12.2 Discussion

The security SCA covers the programs required to implement and support the security requirements stipulated in the [Nuclear Security Regulations](#) (NSR), the licence, orders, and regulatory expectations for the facility or activity. CNSC staff assess CNL's performance in the security SCA through desktop reviews of documents, reportable events and through the course of inspections.

For this current licence period, CNSC staff assessed CNL's security program compliance against regulatory requirements including CSA N290.7-14, *Cyber-security for nuclear power plants and small reactor facilities* [65] and the following CNSC regulatory documents:

- [REGDOC-2.12.1: High-Security Sites, Volume I: Nuclear Response Force, Version 2](#)
- [REGDOC-2.12.1: High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices](#)
- [REGDOC-2.12.2: Site Access Security Clearance](#)
- [REGDOC-2.12.3: Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1](#)

During the WL licence renewal in 2019, the Commission added a facility-specific licence condition related to the implementation of all security arrangements as outlined in CNL's Corrective Action Plan (CAP), otherwise known as the Implementation Plan [61]. Licence condition 12.2 states that "*The licensee shall complete the implementation of all security arrangements as outlined in the Corrective Action Plan: Implementation Plan: Tiered Response Force (TRF) 119-508710-PLA-010, no later than May 1, 2020.*". CNL was required to maintain all compensatory measures that were put in place to address Order #9336, as it worked towards full implementation of the implementation plan for the TRF security program.

4.12.3 Summary

A summary of CNL's past performance, challenges and proposed improvements are presented in the following subsections.

4.12.3.1 Past Performance

In 2020, CNSC staff planned a Type II compliance inspection to verify the CNL-WL's Implementation Plan for the establishment of a TRF (as required by the new licence condition introduced in 2019). This inspection as well as all follow-up site visits were postponed due to COVID-19 restrictions. Throughout 2020 and 2021, CNSC staff held regular virtual technical meetings and maintained oversight of CNL's progress and the performance of the security program at WL. CNL provided regular updates and submitted technical supporting documentation on the improvements being made to the security program.

CNSC staff determined that CNL had met all the terms and conditions of the Order based on information provided by CNL in its written submissions. In November 2020, Order #9336 was closed by the Designated Officer. As mentioned earlier, CNSC staff were unable to perform independent on-site verifications of WL's compliance due to the COVID-19 pandemic at that time. CNSC staff communicated to CNL, that once COVID-19 restrictions were eased, and it was safe to do so, an in-person inspection would be conducted at the WL site to verify, assess, and confirm the adequate implementation and performance of WL's security program. CNL initially received a rating of satisfactory (SA) for the security SCA at WL in 2020.

On September 27-29, 2021, CNSC staff conducted an on-site security inspection at WL to verify the implementation of the TRF and the implementation of other security measures. The inspection identified significant deficiencies in the implementation of the security program, that were in effect during the 2020 and 2021 calendar years. More specifically, the non-compliances were related to the accessibility of special equipment and the training of TRF personnel. These areas did not pose any immediate risk to the security of nuclear substances at WL. CNL provided a Corrective Action Plan with milestones and timelines that were accepted by CNSC staff. CNSC staff have verified that all items identified in CNL's CAP to address this deficiency have been completed. As the inspection identified deficiencies that spanned throughout 2020 and 2021, CNSC staff amended the 2020 SA rating. CNL was provided a revised rating of BE for 2020 and a BE rating for 2021.

On June 15, 2022, CNSC staff conducted a follow-up site visit to verify the progress of the corrective actions concerning TRF equipment and training issues. CNSC staff reviewed procurement documents related to the status of the Order and receipt of equipment and training-related actions taken by CNL. CNSC staff review of CNL's documents demonstrated that training-related corrective actions have been completed. Furthermore, all equipment required had been procured and, for the most part at that time, been received except for some equipment including tactical protective equipment due to significant supply chain shortages because of COVID and strategic priorities to supply Ukraine with equipment during the Russia-Ukraine conflict.

On September 14-16, 2022, a planned inspection was conducted at WL to assess CNL's compliance with the regulatory requirements through verification of its physical protection program that included: the Protected Area, physical barriers and associated systems, security practices, as well as response arrangements, and drills and exercises. CNSC staff also reviewed training records that included thirty-day security drills that had occurred since CNSC staff visited the site in June 2022. CNSC staff were satisfied with CNL's actions and assessed that CNL met applicable regulatory requirements in 2022. Therefore, CNL was assigned a rating of "satisfactory" for the security SCA at WL.

On August 14-16, 2023, CNSC staff conducted a focused inspection to assess CNL's compliance with the regulatory requirements through verification of its physical protection program that included: the protected area, physical barriers and associated systems, security practices, as well as response arrangements, drills and exercises. CNSC staff also reviewed training records that included security drills that had occurred since CNSC staff last inspected the site in August 2022.

During this inspection, CNL identified an area of non-compliance related to access to the protected area, more specifically a mid-point review that had not been completed for 1 CNL employee. CNL took immediate actions, including a detailed review and conducted follow-up actions including providing documentation for CNSC staff review. CNSC staff were satisfied with CNL's actions and closed the NNC. CNSC staff assessed that CNL met applicable regulatory requirements in 2023, and therefore assigned a satisfactory rating for the security SCA at WL for 2023.

4.12.3.2 Regulatory Focus

At the time of writing this report, CNSC staff informed CNL of a planned focused inspection that will be conducted at the WL site from June 24-26, 2024. An update with details of the results of this inspection will be provided during the presentation of the CMD in October 2024. CNSC staff will continue to monitor regulatory oversight of the Security SCA through focused compliance verification activities, focused technical meetings and technical reviews of CNL's submissions.

CNL is currently planning to perform a fuel consolidation project to have spent nuclear fuel baskets from the WL retrieved, packaged and transported to CNL's Chalk River Laboratories (CRL) for consolidated storage. The activities related to the fuel consolidation project are permitted as authorized activities per the current WL licence and would continue to be permitted under the proposed renewed 3-year licence, as CNL is not requesting any amendments to the licence in its licence renewal application. This fuel consolidation project has security implications regarding the transportation of spent nuclear fuel between the 2 CNL sites. The fuel consolidation project is further discussed in subsection 4.14 of this CMD.

CNL is required to submit a transportation security plan in 2025 for CNSC staff review and acceptance, prior to commencing the transportation of spent fuel baskets from WL to its CRL site. CNSC staff will review CNL's transportation security plan once submitted and conduct focused compliance verification activities to ensure that CNL maintains adequate safety and security measures during the conduct of all activities of the fuel consolidation project.

4.12.3.3 Proposed Improvements

No improvements to this SCA are proposed.

4.12.4 Conclusion

CNSC staff concluded that the overall performance for this SCA is satisfactory since 2022, and that CNL is qualified to carry out the authorized activities at WL for this SCA. CNSC staff also concluded that CNL has an acceptable security program in place at WL that meets regulatory requirements and makes adequate provisions for the maintenance of national security.

CNSC staff will continue ongoing compliance activities and monitoring activities in the security area to verify that CNL's security program at the WL, including the implementation of the implementation plan for the TRF security program.

4.13 Safeguards and Non-Proliferation

The Safeguards and Non-Proliferation SCA covers the programs and activities required for the successful implementation of the obligations arising from the [*Treaty on the Non-Proliferation of Nuclear Weapons*](#) and the associated measures arising from Canada and the International Atomic Energy Agency (IAEA) safeguards agreements. This SCA comprises a safeguards program and a non-proliferation program.

The scope of the non-proliferation program for the WL site is limited to the tracking and reporting of foreign obligations and origins of nuclear material. This tracking and reporting assist the CNSC in the implementation of Canada's bilateral Nuclear Cooperation Agreements. The import and export of controlled nuclear substances, equipment and information identified in the [*Nuclear Non-proliferation Import and Export Control Regulations*](#) require separate authorization from the CNSC, consistent with section 3(2) of the [*General Nuclear Safety and Control Regulations*](#).

The specific areas that comprise this SCA at the WL site includes:

- Nuclear material accountancy and control
- Access and assistance to the IAEA
- Operational and design information
- Safeguards equipment, containment, and surveillance
- Import and export (requires separate authorization)

4.13.1 Trends

The following table indicates the overall rating trends for the Safeguards and Non-Proliferation SCA over the current licensing period:

TRENDS FOR SAFEGUARDS AND NON-PROLIFERATION				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNSC staff concluded that the performance for the Safeguards and Non-Proliferation SCA is “satisfactory” and that WL is qualified to carry out the authorized activities in this SCA.</p>				

4.13.2 Discussion

CNL has an effective safeguards program that conforms to measures required by the CNSC to meet Canada’s international safeguards obligations as well as other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons*.

The CNSC regulatory mandate includes ensuring conformity with measures required to implement Canada’s international obligations on the peaceful uses of nuclear energy. Under the *Treaty on the Non-Proliferation of Nuclear Weapons*, Canada has entered into a Comprehensive Safeguards Agreement and Additional Protocol with the IAEA (hereafter, the safeguards agreements). The objective of the Canada/IAEA safeguards agreements is for the IAEA to provide annual assurance to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no indication of undeclared material.

The CNSC provides the mechanism, through the [NSCA](#), the regulations and a licence condition, for the IAEA to implement the safeguards agreements. Conditions for the application of IAEA safeguards are contained in the licence, and the criteria to meet the conditions are contained in the LCH.

4.13.3 Summary

A summary of CNL’s past performance, challenges and proposed improvements are presented in the following subsections.

4.13.3.1 Past Performance

Nuclear Material Accountancy and Control

The WL complied with the CNSC’s regulatory requirements per [REGDOC-2.13.1, Safeguards and Nuclear Material Accountancy](#). WL submitted all required nuclear material accountancy reports over the licensing period.

Access and Assistance to the IAEA

CNL WL granted adequate access and assistance to the IAEA for safeguards activities during the licensing period.

During the current licensing period from 2019-2024, the IAEA performed safeguards activities, including 5 Physical Inventory Verifications (PIV), 3 Interim Inventory Verification (IIV), 5 Design Information Verifications (DIV), 1 Complementary Access (CA) and 1 IAEA technical visit. This information is summarized in Table 7. In all cases, WL provided the IAEA with the necessary access and assistance to perform the activities and complied with all regulatory requirements.

Table 7: IAEA inspection activities

Year	Physical Inventory Verification (PIV)	Interim Inventory Verification (IIV)	Design Information Verification (DIV)	Complementary Access (CA)	IAEA Technical Visit
2019	0	0	1	0	0
2020	1	1	1	0	1
2021	1	2	1	0	0
2022	1	0	1	1	0
2023	1	0	1	0	0
2024	1	0	1	0	0
Total	5	3	5	1	1

Operational and Design Information

During the licensing period, WL submitted its annual operational programs and Additional Protocol declarations, as well as quarterly updates to the operational program on time. The CNSC reviewed these documents and determined that they met requirements and expectations. WL provided revisions to its Design Information Questionnaire (DIQ) throughout the licensing period to reflect the safeguards-relevant changes to the facility and its safeguards program.

Safeguards Equipment, Containment and Surveillance

During the licensing period, WL provided the required assistance for the maintenance of IAEA's safeguards containment systems.

Overall, CNL programs for safeguards and non-proliferation at the WL site continued to meet CNSC requirements and expectations.

Concerning CNL's plan for the execution of the fuel consolidation project which will see the relocation of spent fuel from WL to CRL in Ontario, the IAEA has developed a new safeguards approach. This will consist of the installation of safeguards equipment, specifically, surveillance systems and neutron detectors which will be attached to WL's transfer flasks. The equipment will ensure that the IAEA maintains continuity of knowledge of the spent fuel while it is being shipped to CRL. WL has agreed to the IAEA's proposed equipment installation and will provide them with the required access and assistance to complete these activities.

Import And Export

The scope of the non-proliferation program is limited to the tracking and reporting of foreign obligations and origins of nuclear material. CNSC staff determined that WL has complied with the CNSC's regulatory requirements in this respect.

4.13.3.2 Regulatory Focus

CNL is conducting a fuel consolidation project for transferring nuclear waste from WL in Manitoba to CRL in Ontario during the proposed 3-year licence period. CNL provides monthly updates regarding the project to CNSC staff including planned timelines and progress of regulatory submissions for CNSC staff review. CNSC staff are developing a compliance plan to be in place for CNL's fuel consolidation project to verify and ensure regulatory requirements, including Safeguards and Non-Proliferations requirements, are met for the planning and execution of this material transfer between the 2 CNL sites.

CNSC staff will continue to monitor WL performance through participation in IAEA inspections, evaluations independent of the IAEA, and ongoing assessments of compliance with the various reporting requirements.

4.13.3.3 Proposed Improvements

CNSC staff have not identified any proposed improvements for the Safeguards and Non-Proliferation SCA.

4.13.4 Conclusion

CNSC staff assessed the CNL's documentation and performance under the Safeguards and Non-Proliferation SCA and found it to be acceptable. CNSC staff concluded that the overall performance for this SCA is satisfactory, and that CNL is qualified to carry out the authorized activities at WL for this SCA.

4.14 Packaging and Transport

The Packaging and Transport SCA covers the safe packaging and transport of nuclear substances to and from the licensed facility.

The specific areas that comprise this SCA at the WL site include:

- Package design and maintenance;
- Packaging and transport; and
- Registration for use.

4.14.1 Trends

The following table indicates the overall rating trends for the Packaging and Transport SCA over the current licensing period:

TRENDS FOR PACKAGING AND TRANSPORT				
Overall Compliance Ratings				
2019	2020	2021	2022	2023
SA	SA	SA	SA	SA
<p style="text-align: center;">Comments</p> <p>The ratings for 2014 to 2018 were all SA. These were reported in CMD 19-M24, Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 [10].</p> <p>CNL continues to be rated SA in this SCA at WL. CNSC staff conclude that CNL's Packaging and Transport program ensures compliance with the regulations.</p>				

4.14.2 Discussion

CNL has developed and implemented a packaging and transport program to ensure all shipments leaving any of its sites, including WL, comply with the [*Packaging and Transport of Nuclear Substances Regulation, 2015*](#) and the [*Transportation of Dangerous Goods Regulations*](#). CNL's packaging and transport program covers elements of packaging and transport, package design and maintenance, and registration for use as required by the regulations. Details of CNSC's staff assessment are presented in the following paragraphs.

The *Packaging and Transport of Nuclear Substances Regulation, 2015* apply to the packaging and transport of nuclear substances, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages.

CNL is required to have appropriate training for personnel involved in the handling, offering for transport and transport of dangerous goods, and is required to issue a training certificate to those workers under the *Transportation of Dangerous Goods Regulations*.

CNL will be conducting a fuel consolidation project to have spent nuclear fuel baskets from the WL site retrieved, packaged and transported to CNL's CRL for consolidated storage. The activities related to the fuel consolidation project are permitted as authorized activities per the current WL licence and would continue to be permitted under the proposed renewed 3-year licence, as CNL is not requesting any amendments to the licence in its licence renewal application. CNL is aiming to begin spent nuclear fuel basket movements in late 2025 into 2026.

CNSC's compliance activities in this SCA have included desktop reviews of the companywide corporate program as well as inspections at both the WL site and CRL site, which is the primary destination for nuclear substances transported from the WL site. There are no concerns with CNL's implementation of its packaging and transport program.

4.14.3 Summary

A summary of the licensee's past performance, challenges and proposed improvements are presented in the following subsections.

4.14.3.1 Past Performance

There was 1 event reported under the [*Packaging and Transport of Nuclear Substances Regulations, 2015*](#) for consignments transported from the WL. In 2019, a waste container that was transported from the WL site was not adequately assessed and this resulted in some of its content not being listed in the records. It should be noted that the material was transported in an appropriate transport package. CNSC staff are satisfied with the corrective actions taken by the licence and determined the event was of low safety significance to the environment and the public.

During the licencing period, CNSC staff completed 1 Packaging and Transport inspection at WL. The inspection resulted in 2 NNCs that were of low safety significance as determined by CNSC staff. The NNCs were related to updating shipping and receiving procedures and ensuring clear labelling of reusable packages at WL. CNSC staff were satisfied with the corrective actions taken by CNL.

4.14.3.2 Regulatory Focus

CNSC staff expect to receive a licence to transport application from CNL regarding its plan to consolidate spent fuel to its CRL site in July 2025. CNSC staff will review CNL's licence to transport application when CNL submits it.

CNL provides periodic updates regarding the fuel consolidation project to CNSC staff including planned timelines. CNSC staff are developing a compliance plan to be in place for CNL's fuel consolidation project to verify and ensure regulatory requirements, including Packaging and Transport requirements, are met for the planning and execution of this material transfer between the WL and CRL sites.

CNSC staff will continue to monitor and evaluate CNL's performance in this SCA through regulatory oversight activities including inspections and reviews of compliance reports and other CNL submissions.

4.14.3.3 Proposed Improvements

Transport Canada has recently published several amendments to the [Transportation of Dangerous Goods Regulations](#). Although regulatory changes are minor, CNL will review its packaging and transport program to ensure continued compliance with the revised regulations.

4.14.4 Conclusion

CNSC staff assessed the CNL's documentation and past performance under the Packaging and Transport SCA and found it to be acceptable. CNL's implementation of the packaging and transport SCA has met and continues to meet all applicable regulatory requirements.

CNSC staff concluded that the overall performance for this SCA is satisfactory, and that CNL is qualified to carry out the authorized activities at WL for this SCA.

4.15 Indigenous Consultation and Engagement

The common-law duty to consult with Indigenous Nations and communities applies when the Crown contemplates actions that may adversely affect potential or established Indigenous and/or treaty rights. The CNSC ensures that all of its licence decisions under the [NSCA](#) uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights under section 35 of the [Constitution Act, 1982](#).

CNSC staff are committed to building long-term relationships with Indigenous Nations and communities who have an interest in CNSC-regulated facilities within their traditional and/or treaty territories. The CNSC's Indigenous engagement practices include sharing information, discussing topics of interest, seeking feedback and input on CNSC processes, and providing opportunities to participate in environmental monitoring.

The CNSC also provides funding support (through the CNSC's Participant Funding Program) for Indigenous peoples to meaningfully participate in Commission proceedings and ongoing regulatory activities.

CNSC staff welcomed the opportunity to discuss and address topics of interest and concern related to the WL licence renewal with the identified and interested Indigenous Nations and communities through various engagement and communication activities and conduct collaborative in-person activities to continue to build and strengthen the relationship between the CNSC and each Nation.

4.15.1 Discussion

The WL site is in the homeland of the Red River Métis, Treaty 1 and Treaty 3 territories, and the traditional territory of the Anishinaabe and Ojibway People. The WL site is also located in the vicinity of Treaty 5 territory.

CNSC staff have identified the Indigenous Nations and communities who may have a potential interest in CNL's proposed decommissioning activities and licence renewal at WL in Pinawa, Manitoba which include:

- Sagkeeng Anicinabe First Nation (Sagkeeng)
- Manitoba Métis Federation (MMF)
- Brokenhead Ojibway Nation (BON)
- Black River First Nation (BRFN)
- Hollow Water First Nation (HWFN)
- Northwest Angle No.33
- Shoal Lake #40 First Nation
- Iskatewizaagegan #39 Independent First Nation
- Wabaseemoong Independent Nations
- Grand Council of Treaty 3 (GCT 3)

These Nations were identified due to the proximity of the WL site to their communities, treaty areas and/or traditional territories, or due to previously expressed interest in being kept informed of CNSC-licensed activities occurring in or proximal to their traditional territories.

The Algonquins of Pikwakanagan First Nation (AOPFN) have also expressed interest in the WL site renewal as it relates to CNL's plans for managing WL wastes and materials at Chalk River Laboratories (CRL) long term, which is in their traditional territory.

CNSC staff have been engaging with these identified Indigenous Nations and communities since early 2016 about CNL's proposed in-situ decommissioning of the WR-1 reactor at WL. The engagement between CNSC staff, CNL, AECL and Indigenous Nations has included meetings, site tours, community events and the development of consultation arrangements and leadership meetings. CNSC staff have also continued to engage and collaborate with all identified Nations and communities regarding the annual CNSC staff CNL sites Regulatory Oversight Report, CNSC Independent Environmental Monitoring Program (IEMP) sampling campaigns near the WL site, community events and information sessions, as well as engagement related to the renewal for the WL site in 2019.

For the current WL site licence renewal application by CNL, CNSC staff sent letters of notification on January 22, 2024, to the Indigenous Nations and communities identified above, providing information regarding the proposed licence renewal application, the availability of participant funding to facilitate participation in the licence review, engagement and Commission hearing process, as well as details on how to participate in the Commission's public hearing process scheduled for October 2024. Follow-up email correspondence was sent to Indigenous Nations and communities which included CNL's application for their reference on January 25, 2024.

On March 7, 2024, CNSC sent email correspondence to all identified Indigenous Nations and communities to provide a direct link to the participant funding opportunity made available for the licence renewal. CNSC also followed up with a reminder of the deadline to apply for funding on April 8, 2024.

On June 4, 2024, CNSC staff attended the Regional Leadership Gathering in Beausejour, Manitoba hosted by CNL to support discussions on the WL site including the renewal and to also meet and hear from Indigenous Nations and communities directly on their concerns related to both the WL renewal as well as other projects happening at the site.

Other engagement and communications activities included:

Sagkeeng Anicinabe First Nation (Sagkeeng)

CNSC staff have been working with Sagkeeng since early 2016 regarding CNL's proposed in-situ decommissioning of the WR-1 reactor at the WL site, in addition to the 2019 and 2024 licence renewals for WL. CNSC staff have continued to communicate, collaborate, and meet with Sagkeeng regarding the activities related to the WL site.

CNSC staff have participated in several community events and activities in Sagkeeng's community when invited. This included community information sessions, meetings with leadership, community tours, a traditional ceremony with Sagkeeng's Turtle Lodge, Sagkeeng Treaty Days, and attending Sagkeeng's Community Liaison Committee meetings.

CNSC staff have also offered to develop a Terms of Reference (ToR) for long-term engagement with Sagkeeng; however, Sagkeeng has not expressed a direct interest in developing a ToR or engagement work plan with the CNSC to date. Should Sagkeeng be interested, CNSC staff remain open to developing a ToR with Sagkeeng in the future.

In addition, through the CNSC's Indigenous and Stakeholder Capacity Fund (ISCF), Sagkeeng has been provided funding to support developing their capacity, including funding to hire a consultation coordinator from their community and funding to support Sagkeeng Treaty Days and funding to support Sagkeeng's review of the proposed updates to REGDOC 3.2.2: Indigenous engagement. CNSC staff continue to offer to meet with Sagkeeng and are open to collaborating with Sagkeeng to establish more regular meetings and an engagement work plan moving forward.

CNSC recognizes that as part of the previous WL licence renewal Commission hearing in 2019, Sagkeeng raised several issues and concerns, including those related to the ongoing fear and avoidance of the WL site by Sagkeeng community members, a desire for greater participation in the CNSC's Independent Environmental Monitoring Program (IEMP) as it relates to the WL site, and the need for a psychosocial impact assessment completed for the WL site. Since 2019, CNSC staff have been working with Sagkeeng to address these issues and concerns.

In 2022, CNSC staff met with Sagkeeng to discuss the IEMP for the WL site and review the sampling plan. Sagkeeng provided comments on the sampling plan and in August 2022 joined CNSC staff in the field to sample together, including items and species of interest to Sagkeeng. CNSC staff are also working with Sagkeeng to include a summary of their independent environmental monitoring program Niigan Aki in CNSC's Environmental Protection Review (EPR) report for this upcoming licence renewal.

Based on funding awarded by the CNSC through the Participant Funding Program (PFP) and funding from CNL, Sagkeeng completed a psychosocial impact assessment for the WR-1 Project and WL site. The results and recommendations of the study are to be included in CNL's environmental impact statement (EIS) for the in-situ decommissioning of the WR-1 reactor, as well as CNSC staff's CEAA 2012 Environmental Assessment Report for the project. The study has also helped to inform ongoing discussions between Sagkeeng and CNL about potential approaches and commitments to address their concerns concerning the WR-1 project. CNSC will continue to work with Sagkeeng to identify and address concerns that are brought forward for both the WL licence renewal and the in-situ decommissioning of the WR-1 reactor project.

Manitoba Métis Federation (MMF)

CNSC staff have been working with MMF since early 2016 regarding CNL's proposed in-situ decommissioning of the WR-1 reactor at the WL site, as well as both the renewals for WL in 2019 and 2024. CNSC staff have continued to meet regularly, communicate and collaborate with MMF regarding activities related to the WL site. Additionally, when invited, CNSC staff have participated in several community events and activities in MMF's community. This includes events such as community information sessions, meetings with leadership, community tours, and attending the Manitoba Métis Annual General Assembly.

CNSC has also offered to develop a Terms of Reference (ToR) for long-term engagement with MMF and MMF has been open to a more formalized engagement agreement however, future discussions regarding the content and format of the ToR are required before moving forward. The MMF remains willing and open to explore the development of a ToR provided it can serve to advance the concerns and recommendations of the Red River Métis.

Through the CNSC's Indigenous and Stakeholder Capacity Fund (ISCF), CNSC has provided MMF funding to support developing their capacity, including funding to hire a consultation coordinator from their community. CNSC staff continue to meet with MMF on a 6-week basis where both the WL licence renewal and the in-situ decommissioning of the WR-1 reactor project are discussed.

CNSC staff recognize that as part of the previous WL licence renewal hearing in 2019, MMF has raised several issues and concerns, including those related to the uncertainties of the WL end state, wanting more participation in the Independent Environmental Monitoring Program (IEMP), and continued participation in the CNL Regulatory Oversight Report (ROR). Since 2019, CNSC staff have been working with MMF to address these issues and concerns, including actively involving MMF in the IEMP in 2022 at the WL site and including a summary of their monitoring activities in CNSC's Environmental Protection Review (EPR) report for this upcoming licence renewal.

CNSC continues to actively involve MMF in the annual CNL ROR, including working collaboratively on issues and concerns tracking and will continue to do so for the upcoming CNL ROR. CNSC will continue to work with MMF to identify and address concerns identified for both the WL licence renewal and the in-situ decommissioning of the WR-1 reactor project.

Black River and Hollow Water First Nations (BRFN & HWFN)

CNSC staff have been working with BRFN and HWFN since early 2016 regarding CNL's proposed in-situ decommissioning of the WR-1 reactor at the WL site, as well as both renewals for WL in 2019 and 2024. CNSC staff have continued to meet, communicate, and collaborate with BRFN and HWFN regarding activities related to the WL site, and, when invited, participate in several community events and activities in BRFN and HWFN communities. This includes events such as participating in the BRFN and HWFN Core Engagement team meetings to discuss the WL site, WR-1 EA, and the proposed updates to REGDOC-3.2.2, Indigenous Engagement.

Both BRFN and HWFN have been participating in the Federal Indigenous Review Team (FIRT) as part of the environmental assessment (EA) process for the in-situ decommissioning of the WR-1 reactor project. This process allows BRFN and HWFN to be actively involved in the EA process, where issues and concerns are brought forward for WR-1 and are addressed and documented. CNSC staff continue to offer to meet with BRFN and HWFN and are open to collaborating with BRFN and HWFN to establish more regular meetings and engagement moving forward.

BRFN and HWFN both participated in the 2022 IEMP sampling for the WL site. Representatives from BRFN, HWFN, and CNSC staff discussed the IEMP and demonstrated sampling techniques as well as packaging and chain of custody procedures. Water, soil, and vegetation (grass and blade grass) were sampled together.

Other Interested Nations

CNSC staff have been working with other interested Nations such as Brokenhead Ojibway Nation (BON), Northwest Angle No.33, Shoal Lake #40 First Nation, Iskatewizaagegan #39 Independent First Nation, Wabaseemoong Independent Nations, and Grand Council of Treaty 3 (GCT 3) since early 2016 regarding CNL's proposed in-situ decommissioning of the WR-1 reactor at WL, as well as both renewals for WL in 2019 and 2024. CNSC staff have continued to reach out to these Indigenous Nations and communities, offering to meet to discuss the WL site licence renewal and the WR-1 EA.

To date, CNSC staff have been made aware of concerns regarding waste at the WL site, including the disposal of nuclear waste and long timelines for the proposed Nuclear Waste Management waste disposal facility. There is no specific plan put forward by CNL to bury or manage waste over the long term as part of this licence renewal; however, CNSC staff are committed to working with each Indigenous Nation and community to address their concerns and ensure that CNL is aware and working with the communities to understand and address the concerns, as appropriate.

Peguis First Nation, whose community is in the interlake region of Manitoba, approximately 260 km from the Whiteshell site has recently communicated to CNL that they have potential interests in the Whiteshell site and the WR-1 in-situ decommissioning project. CNSC staff and CNL are working to learn more about Peguis First Nation and any interests they may have with WL.

The CNSC's regulatory document [REGDOC-3.2.2, Indigenous Engagement](#), sets out requirements and guidance for licensees whose proposed projects may raise the Crown's duty to consult. While the CNSC cannot delegate its obligation, it can delegate procedural aspects of the consultation process to licensees, where appropriate. The information collected and measures proposed by licensees to avoid, mitigate, or offset adverse impacts from the proposed licence renewal may support the CNSC in meeting its consultation obligations.

CNL's application for licence renewal of the WL does not raise the formal requirements of REGDOC-3.2.2. However, CNSC staff recognize that CNL has well-established engagement activities and communications with interested Indigenous Nations and communities and are committed to keeping CNSC staff informed of their engagement activities and any issues raised by the identified Indigenous Nations and communities. CNSC staff encourage CNL to continue engaging with interested Indigenous Nations and communities regarding their facilities and activities, including the licence renewal application.

CNL Indigenous Consultation and Engagement

CNL first brought forward information on the 2024 WL licence renewal application during regularly occurring monthly meetings with Indigenous Nations and communities in February 2024.

In March 2024, CNL shared an email with the following Indigenous Nations and communities with interests and/or rights within the Whiteshell region:

- Sagkeeng Anicinabe First Nation
- Manitoba Métis Federation
- Black River First Nation
- Hollow Water First Nation
- Brokenhead Ojibway Nation
- Wabaseemoong Independent Nations
- Grand Council Treaty #3
- Peguis First Nation

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. CNL also offered a meeting and support for community participation in the licensing process.

CNL also shared a similar email with the Indigenous Nations and communities engaging with CNL in Ontario, including the Algonquins of Pikwakanagan First Nation and the communities that form the Williams Treaties First Nations.

Since then, CNL has followed up on these emails during regular meetings with these communities.

CNL also emailed all Indigenous Nations and communities that have interests and/or rights in the vicinity of all CNL-managed sites, an invitation to a public webinar on the Whiteshell Fire Program in April 2024. The beginning of this webinar was a slide highlighting how to participate in the Whiteshell Licence Renewal Hearing.

On May 15, 2024, CNL emailed all Indigenous Nations and communities engaging with CNL with an invitation to review CNL's CMD ahead of CNL submitting the CMD to the CNSC. In this email, CNL reiterated an offer to meet and provide capacity for hearing participation and reshared a link to information on the licensing process.

CNL has made positive efforts and progress in developing relationships, collaboration agreements, funding support, and collaborative monitoring activities with interested Indigenous Nations and communities. CNL has also been working closely with each Nation to address the concerns they raised as part of the last licence renewal hearing for WL in 2019, as well as issues, concerns, and recommendations raised during the annual CNL ROR Commission proceedings.

4.15.2 Conclusion

As CNL is not proposing any changes to the facilities or their operations at the WL site, CNSC staff have concluded that a licence renewal for the WL site is not expected to lead to any new adverse impacts on any potential or established Indigenous and/or treaty rights. The identified Indigenous Nations and communities have been notified and encouraged to provide interventions for this hearing, providing an opportunity to advise the Commission directly of any concerns they may have regarding this request.

CNSC staff have conducted a thorough engagement process based on existing engagement and communications protocols, processes, and relationships. CNSC staff have responded to all concerns raised to date about the WL licence renewal application and will continue working with each Indigenous Nation and community to address their concerns. In addition, CNL has a well-established Indigenous engagement program and existing ongoing relationships with Indigenous Nations and communities with rights and interests concerning the WL site. CNSC staff encourages CNL to continue their engagement and work with each Nation and community to continue to understand and address questions or concerns they may have with the WL site, as appropriate.

CNSC staff are committed to providing opportunities for meaningful long-term engagement and collaboration with interested Indigenous Nations and communities providing ongoing updates related to the WL site and collaborating on monitoring activities and oversight, as appropriate.

4.16 CNSC Public Consultation and Engagement

The [NSCA](#) mandates the CNSC to disseminate objective scientific, technical and regulatory information to the public concerning its activities and the activities it regulates. CNSC staff fulfil this mandate in a variety of ways, including hosting in-person and virtual information sessions and through annual regulatory reports.

4.16.1 Discussion

As per section 17 of the [Canadian Nuclear Safety Commission Rules of Procedure](#), a Notice of Public Hearing has been issued and posted on the CNSC website inviting written comments and requests for appearances before the Commission. CNSC staff also communicated information about the regulatory process for the renewal of CNL WL to the public, stakeholders and Indigenous communities through various methods including feature articles, graphics on the CNSC website, meetings, media and public webinars, and social media accounts.

CNSC staff encourage the public and Indigenous communities to participate in the Commission's public hearing. The Participant Funding Program was offered to assist interested members of the public, Indigenous peoples, and other stakeholders to prepare for and participate in the Commission's public hearing.

4.16.2 Conclusion

CNSC staff continue to inform the public and Indigenous communities of our regulatory activities through regular website updates, publicly webcast Commission proceedings, social media, public webinars, mail drops and regular discussions with key audiences near the facility. CNSC staff encourage the public and Indigenous communities to participate in the Commission's public hearing. The PFP was offered to assist interested members of the public, Indigenous peoples, and other stakeholders to prepare for and participate in the Commission's public hearing.

4.17 Participant Funding Program

The CNSC established the PFP in 2011 to:

1. enhance individual, public and Indigenous Nations and communities and other stakeholders' participation in the CNSC's environmental assessment (EA) and licensing processes for major nuclear facilities (e.g., uranium mines, nuclear power plants, nuclear substance processing, or nuclear waste facilities)
2. assist individuals, Indigenous Nations and communities and other stakeholders to bring value-added information to the Commission through informed and topic-specific interventions related to EAs and licensing (i.e., new, distinctive and relevant information that contributes to a better understanding of the anticipated effects of a project)

4.17.1 Discussion

The CNSC made available funding through its PFP to assist members of the public, Indigenous Nations and communities, and other stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. This funding was offered to review CNL's licence renewal application and associated documents and to prepare for and participate in the Commission's public hearing.

The PFP application deadline was April 19, 2024. The Funding Review Committee, independent of CNSC staff, reviewed the applications received and made recommendations on the allocation of funding to eligible recipients. Based on the recommendations from the Funding Review Committee, the CNSC provided a total of \$121,568 in funding. Funding was provided to the following entities:

- Radiation Safety Institute of Canada
- Manitoba Métis Federation
- Canadian Environmental Law Association
- The Algonquins of Pikwakanagan First Nation
- Northwatch

- Black River and Hollow Water First Nations
- Sagkeeng Anicinabe First Nation

4.17.2 Conclusion

CNSC staff have aided interested members of the public, Indigenous Nations and communities and other stakeholders, through the PFP, to prepare for and participate in the public hearing.

5. Other Matters of Regulatory Interest

5.1 Cost Recovery

Paragraph 24(2)(c) of the [NSCA](#) requires that a licence application is accompanied by the prescribed fee. The [CNSC Cost Recovery Fees Regulations](#) (CRFR) set out the specific requirements based on the activities to be licensed. An applicant for a Class I facility licence is subject to Part 2 of CRFR, which is based on Regulatory Activity Plan fees.

5.1.1 Discussion

Through a review of CNSC records, CNSC staff have concluded that CNL is in good standing for CRFR requirements for WL. CNL has paid their cost recovery fees in full.

5.1.2 Conclusion

CNSC staff concluded that CNL is in good standing concerning CRFR requirements for WL.

5.2 Financial Guarantees

Under subsection 24(5) of the NSCA, CNL is required to provide a financial guarantee in a form that is acceptable to the Commission. [GNSCR](#), paragraph 3(1)(l) stipulates that “an application for a licence shall contain a description of any proposed financial guarantee related to the activity for which a licence application is submitted.” The financial guarantee for decommissioning is established to fund the activities described in the Preliminary Decommissioning Plan (PDP). These requirements are found in [REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*](#).

5.2.1 Discussion

Concerning a financial guarantee required by paragraph 3(1)(l) of the GNSCR, REGDOC-3.3.1 states that an expressed commitment from a federal or provincial government is an acceptable form of financial guarantee.

AECL is a Schedule III, Part 1 Crown Corporation under *the [Financial Administration Act](#)* and an agent of His Majesty in the Right of Canada. As an agent of His Majesty in Right of Canada, AECL’s liabilities are ultimately liabilities of His Majesty in Right of Canada. While the restructuring of AECL has seen the ownership of CNL transferred to a private-sector contractor, the Canadian National Energy Alliance, AECL retains ownership of the lands, assets and liabilities associated with CNL’s licences.

These liabilities have been officially recognized by the Federal Minister of Natural Resources in a letter dated July 31, 2015 [62]. This letter states that AECL will retain ownership of the lands, assets and liabilities associated with CNL's licences, including the CRL site, and states that the liabilities of AECL are the liabilities of His Majesty in Right of Canada. CNL confirmed that the provisions in the 2015 letter remained valid on August 25, 2020 [63].

5.2.2 Conclusion

CNSC staff conclude that the financial guarantee is sufficient for the decommissioning of the WL site.

5.3 Licensee Public Information and Disclosure

A Public Information and Disclosure Program (PIDP) is a regulatory requirement for licence applicants and licensees of Class I nuclear facilities, uranium mines and mills and certain Class II nuclear facilities. These requirements are found in [REGDOC-3.2.1, *Public Information and Disclosure*](#).

The primary goal of the PIDP is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The program must include a commitment to, and protocol for ongoing, timely communication of information related to the licensed facility during the licence period.

CNSC's expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of the facility, as well as the level of public interest in the licensed activities. The program and protocol may be further influenced by the complexity of the nuclear facility's lifecycle, activities and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

5.3.1 Discussion

The CNSC requires licensees to maintain and implement public information and disclosure programs, under CNSC's REGDOC-3.2.1, [Public Information and Disclosure \(PIDP\)](#). These programs are supported by disclosure protocols that outline the type of facility's information to be shared with the public as well as details on how that information is to be disseminated. This ensures that timely information about the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities, is effectively communicated to the public.

CNSC staff have reviewed WL PIDP, that was submitted as part of [CNL's Public Information Program](#). CNSC staff regularly monitor CNL's implementation of its public information and disclosure program to verify that it communicates regularly with its audiences in a way that is open, transparent and meaningful to them. CNSC staff also review yearly program updates to verify that CNL is considering communities' feedback into consideration and taking steps to implement program adjustments to meet the evolving needs of the various communities as it pertains to communications.

CNSC staff have reviewed CNL's PIDP and determined that it:

- identifies clear goals and measurable objectives in terms of dissemination of information to targeted audiences.
- is available to the public and is posted on CNL's website.
- targets multiple audiences such as residents, elected and government representatives, media, business leaders, youth, interest groups, and community organizations.
- provides contact information for members of the public who want to obtain additional information.

CNSC staff will continue to monitor CNL's compliance with REGDOC-3.2.1 and ongoing implementation of their PIDP.

Communications activities conducted by CNL specific to WL included:

- Posted information on their website regarding the 2024 relicensing with CNSC.
- Posted webinar/videos regarding the WL restoration project.
- Community Information Bulletins re: Administrative Monetary Penalty (AMP), training lapses, work stand down (April 28, 2023; May 9, 2023; and June 27, 2023) and partial restart of work.
- Reported 9 event summaries FY 2023/24 (3 in Q1, 2 in Q2; 4 in Q3); and 2 in Q4 FY 2022/23.
- Sent out information externally to local communities and interested stakeholders via newsletters (mailout and online), as well as internally to CNL employees via staff meetings, intranet and internal newsletters (online).
- CNL presents their public outreach and Indigenous engagement activities to CNSC staff at regularly scheduled meetings.

In 2023, WL identified non-compliance and deficiencies in its Fire Protection Program. When it was identified and in the time that followed, CNL communicated openly with the public, Indigenous Nations and communities, its stakeholders, and staff. This included initial public disclosure to CNL's website and social media channels, holding meetings with local communities and Indigenous Nations and communities, posting community information bulletins, and keeping staff informed through regular updates and all-staff meetings.

5.3.2 Conclusion

CNL has a valid [Public Information and Disclosure Program](#) document with the CNSC. CNSC staff have no concerns about CNL's PIDP and determine that CNL's PIDP meets the regulatory requirements of REGDOC-3.2.1 *Public Information and Disclosure*.

[REGDOC 3.2.1 Public Information and Disclosure](#) does not go into detail about the requirement for separate licence facilities needing unique PIDPs therefore a Whiteshell-specific PIDP is not required, but it is included in CNL's fleet-wide PIDP.

CNSC staff continue to oversee CNL's implementation of the PIDP to ensure that CNL meets its obligations regarding dissemination and notifying the public and Indigenous Nations and communities of its licensed activities.

5.4 Nuclear Liability Insurance

According to section 7 of the [Nuclear Liability and Compensation Act](#) (NCLA), which came into force on January 1, 2017, and previously under the [Nuclear Liability Act](#) (NLA), CNL is required to maintain nuclear liability insurance for designated nuclear installations.

5.4.1 Discussion

The WL site contains several facilities which are authorized to contain nuclear material as defined in the [NLCA](#). These facilities fall under various risk categories, as defined in subsection 4(1) of the [Nuclear Liability and Compensation Regulations](#) (NLCR), and are listed in Column 4 of Item 17 in the Schedule.

Because the Concrete Canister Storage Facility is a "Nuclear Fuel Waste Management Facility", it is the facility in this list with the highest risk. As a result, the WL site falls under the "Nuclear Fuel Waste Management Facility Class" under subsection 4(2) of the [NLCR](#) and the operator's liability amount is prescribed at \$13 million according to subsection 5(c) of the NLCR.

5.4.2 Conclusion

CNL has maintained nuclear liability insurance for WL under the [NLA](#) and continues to maintain nuclear liability insurance under the NLCA which came into force on January 1, 2017.

5.5 Delegation of Authority

The Commission may include in a licence any condition it considers necessary for the [NSCA](#). The Commission may delegate authority to CNSC staff with respect to the administration of licence conditions, or portions thereof.

There are 2 proposed licence conditions in the proposed decommissioning licence that contain the phrase "the Commission or a person authorized by the Commission":

1. Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements states, "The licensee shall submit to the Commission or any person authorized by the Commission, reports covering the progress of the licensee's integrated assessment plan at Whiteshell Laboratories."

2. Licence condition 3.2: Reporting Requirements states, “The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.”.

CNSC staff recommend the Commission delegate its authority for the purposes described in the above licence conditions to the following staff:

- Director, Canadian Nuclear Laboratories Regulatory Program Division
- Director General, Directorate of Nuclear Cycles and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch

6. Overall Conclusions and Recommendations

CNSC staff conclusions and recommendations consider an overall assessment of CNL's compliance with the [NSCA](#) and its regulations during the current licence period (2020 to 2024). CNL is not proposing any changes to the facilities or operations at WL. Overall, CNSC staff conclude that CNL's performance during the licensing term was satisfactory. However, CNSC staff have determined that there is a decline in some SCA performances, particularly in Emergency Management and Fire Protection and Human Performance Management areas resulting in below-expectation ratings.

CNSC staff recommend an additional licence condition to improve SCA performance, specifically in Emergency Management and Fire Protection and Human Performance Management SCAs. These SCAs will be closely monitored through a separate CNSC staff developed WL-specific compliance plan to ensure regulatory requirements are met.

CNL has programs, resources, and measures in place at WL to ensure the health and safety of persons and the environment and of the measures related to security and Canada's international obligations during the proposed licence period.

CNSC staff's assessment determined that the application complies with the regulatory requirements. CNSC staff also concluded that the CNL's performance during the current licensing term was overall satisfactory.

Overall Recommendations

CNSC staff recommend the following:

1. Conclude, pursuant to paragraphs 24(4)(a) and (b) of the NSCA in that the CNL:
 - a. Is qualified to carry on the activities authorized by the licence.
 - b. Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.
2. Renew the proposed 3-year NRETDL licence to authorize CNL to continue its authorized activities at the WL from January 1, 2025, to December 31, 2027.
3. Approve the proposed licence condition changes including an additional licence condition 1.2 under the Management System safety and control area outlined in Part 2 of this CMD.
4. Delegate the of authority as set out in subsection 5.5 of this CMD.

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Glossary

For definitions of terms used in this document, see [REGDOC-3.6, *Glossary of CNSC Terminology*](#), which includes terms and definitions used in the [Nuclear Safety and Control Act](#) and the [Regulations](#) made under it, and in [CNSC regulatory documents](#) and other publications.

Acronyms

Acronym	Definition
AECL	Atomic Energy of Canada Limited
ALARA	As Low As Reasonably Achievable
AMP	Administrative Monetary Penalty
AOPFN	Algonquins of Pikwakanagan First Nation
BE	Below Expectations
BON	Brokenhead Ojibway Nation
BRFN	Black River First Nation
CA	Corrective Action
CANDU	CANada Deuterium Uranium
CAP	Corrective Action Plan
CCR	Code Compliance Review
CCSF	Concrete Canister Storage Facility
CEAA	<i>Canadian Environmental Assessment Act</i>
CLF	Cask Loading Facility
CMD	Commission Member Document
CNEA	Canadian Nuclear Energy Alliance
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CRFR	<i>Cost Recovery Fees Regulation</i>
CRL	Chalk River Laboratories
CSA	Canadian Standards Association
CSD	Criticality Safety Document
CSR	Comprehensive Study Report
DCP	Dose Control Point
DDP	Detailed Decommissioning Plan
DIQ	Design Information Questionnaire
DIV	Design Information Verification
DRL	Derived Release Limit

Acronym	Definition
EA	Environmental Assessment
ECCC	Environment Climate Change Canada
EIR	Event Initial Report
EIS	Environmental Impact Statement
EMFP	Emergency Management Fire Protection
EMP	Environmental Monitoring Plan
EMS	Environmental Management System
EPP	Environmental Protection Program
EPR	Environmental Protection Review
ERA	Environmental Risk Assessment
EVMP	Effluent Verification Monitoring Program
FFB	Facility Firefighting Brigade
FHA	Fire Hazard Analysis
FIRT	Federal Indigenous Review Team
FPP	Fire Protection Program
FRNA	Fire Response Needs Analysis
FS	Fully Satisfactory
FTE	Full Time Equivalent
FY	Fiscal Year
GCT 3	Grand Council Treaty 3
GHG	Greenhouse Gas
GNSCR	<i>General Nuclear Safety and Control Regulations</i>
GoCo	Government Owned Contractor Operated
GWMP	Groundwater Monitoring Program
HLW	High-Level Waste
HPM	Human Performance Management
HWFN	Hollow Water First Nation
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
IAP	Integrated Assessment Plan

Acronym	Definition
IEMP	Independent Environmental Monitoring Program
IIV	Interim Inventory Verification
ILW	Intermediate-Level Waste
ISCF	Indigenous and Stakeholder Capacity Fund
ISD	In-Situ Decommissioning
ISO	International Standards Organization
ITM	Inspection, Testing and Maintenance
LCH	Licence Conditions Handbook
LLW	Low-Level Waste
MMF	Manitoba Metis Federation
MS	Management System
MSC	Minimum Shift Complement
NCLA	<i>Nuclear Liability and Compensation Act</i>
NEW	Nuclear Energy Worker
NFPA	National Fire Protection Association
NLA	<i>Nuclear Liability Act</i>
NLCR	<i>Nuclear Liability Compensation Regulations</i>
NNC	Notice on Non-Compliance
NPRI	National Pollutant Release Inventory
NRETDL	Nuclear Research and Test Establishment Decommissioning Licence
NSCA	<i>Nuclear Safety and Control Act</i>
OPEX	Operating Experience
PFP	Participant Funding Program
PIDP	Public Information and Disclosure Program
PIP	Periodic Inspection Plan
PIV	Physical Inventory Verification
PM	Preventative Maintenance
PMR	Preventative Maintenance Regulatory
PPE&C	Personal Protective Equipment and Clothing
QAP	Quality Assurance Plan

Acronym	Definition
RCA	Root Cause Analysis
REGDOC	Regulatory Document
RLTI	Recordable Lost-Time Injuries
ROR	Regulatory Oversight Report
RP	Radiation Protection
RSSSA	Recoverable Surface Storage and Staging Area
SA	Satisfactory
SAR	Safety Analysis Report
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SMAGS	Shielded Modular Above Ground Storage
SSC	Systems, Structures and Components
TRF	Tactical Response Force
UA	Unacceptable
WL	Whiteshell Laboratories
WMA	Waste Management Area
WR-1	Whiteshell Reactor - 1

A. Safety Performance Rating Levels

Satisfactory (SA)

Licensee meets all of the following criteria:

- Performance meets CNSC staff expectations
- Licensee non-compliances or performance issues, if any, are not risk-significant
- Any non-compliances or performance issues have been, or are being, adequately corrected

Below Expectations (BE)

One or more of the following criteria apply:

- Performance does not meet CNSC staff expectations
- Licensee has risk-significant non-compliance(s) or performance issue(s)
- Non-compliances or performance issues are not being adequately corrected

Unacceptable (UA)

One or both of the following criteria apply:

- Risk associated with a non-compliance or performance issue is unreasonable
- At least 1 significant non-compliance or performance issue exists with no associated corrective action

Note: Starting in 2019, facility performance assessment ratings were simplified and the “Fully Satisfactory (FS)” was replaced by the “Satisfactory (SA)” rating. It is important to recognize that a facility that received an SCA performance rating of FS in previous Regulatory Oversight Report and now has a rating of SA, does not necessarily indicate a reduction in performance.

B. Basis for the Recommendation(s)

B.1 Regulatory Basis

The recommendations presented in this CMD are based on compliance objectives and expectations associated with the relevant SCAs and other matters. The regulatory basis for the matters that are relevant to this CMD are as follows.

Management System

The regulatory foundation for the recommendation(s) associated with Management System includes the following:

Management System

- It is a requirement of the [*Class I Nuclear Facilities Regulations*](#) under paragraph 3(d) that an application for a licence for a Class I nuclear facility shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.
- The [*General Nuclear Safety and Control Regulations*](#) require that an application for a licence shall contain, under the following paragraph:
 - 3(1)(k), the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the [*NSCA*](#) and the Regulations made under the NSCA, including the internal allocation of functions, responsibilities and authority.
 - 15(a), the persons who have the authority to act for them (the applicant/licensee) in their dealings with the Commission.
 - 15(b), the names and position titles of the persons who are responsible for the management and control of the licensed activity and the nuclear substance, nuclear facility, prescribed equipment or prescribed information encompassed by the licence.

Human Performance Management

- It is a requirement of the *General Nuclear Safety and Control Regulations* under section 12, that CNL shall:
 - Paragraph 12(1)(a), ensure the presence of a sufficient number of qualified workers to carry on the licensed activity safely and in accordance with the NSCA, the Regulations made under the NSCA, and the licence.
 - Paragraph 12(1)(b), train the workers to carry on the licensed activity in accordance with the NSCA, the Regulations made under the NSCA, and the licence.
 - Paragraph 12(1)(e), require that every person at the site of the licensed activity to use equipment, devices, clothing, and procedures in accordance with the NSCA, the Regulations made under the NSCA, and the licence.

- It is a requirement of the [*Class I Nuclear Facilities Regulations*](#) under paragraph 3(d.1) that a licence application contain the proposed human performance program for the activity to be licensed, including measures to ensure workers' fitness for duty.
- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 6(m) that a licence application contain information on the proposed responsibilities, qualification requirements, and training program for workers including the procedures for the requalification of workers.
- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 6(n) that a licence application contain information on the results that have been achieved in implementing the program for recruiting, training, and qualifying workers in respect of the operation and maintenance of the nuclear facility.

Operating Performance

- Paragraph 6(d) of the *Class I Nuclear Facilities Regulations* requires that an application for a licence to operate a Class I nuclear facility contains the proposed measures, policies, methods and procedures for operating and maintaining the nuclear facility.
- Subsection 24(5) of the [*NSCA*](#) states that CNL may contain any term or condition that the Commission considers necessary for the purpose of the NSCA.

Safety Analysis

- Subparagraph 3(1)(i) of the [*General Nuclear Safety and Control Regulations*](#) requires that an application for a licence shall contain a description and the results of any test, analysis, or calculation performed to substantiate the information included in the application.
- It is a requirement of the *Class I Nuclear Facilities Regulations* that an application for a licence to operate a Class I nuclear facility shall contain the following information under paragraph:
 - 6(c), a final safety analysis report demonstrating the adequacy of the design of the nuclear facility.
 - 6(h), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects.

Physical Design

- Paragraph 3(1)(d) of the *General Nuclear Safety and Control Regulations* requires that an application for a licence shall contain a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence.
- Other requirements set out in paragraphs 3(a), 3(b), 6(a) and 6(b) of the *Class I Nuclear Facilities Regulations* require more specific information to be submitted in the licence application related to the site and design of the facility and the final safety analysis report.

- Paragraphs 6(c) and 6(d) of the [*Class I Nuclear Facilities Regulations*](#) require that an application for a licence contain a final safety analysis report demonstrating the adequacy of the design of the facility and proposed measures, policies, methods, and procedures for operating and maintaining the facility.

Fitness for Service

- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 6(d) that an application for a licence to operate a Class I nuclear facility contain the proposed measures, policies, methods, and procedures for operating and maintaining the nuclear facility.

Radiation Protection

- The [*General Nuclear Safety and Control Regulations*](#) require, under subsection 3(1) that a licence application contain the following information under paragraph:
 - 3(1)(e), the proposed measures to ensure compliance with the [*Radiation Protection Regulations*](#).
 - 3(1)(f), any proposed action level for the purpose of section 6 of the *Radiation Protection Regulations*.
- The *Radiation Protection Regulations* require, under sections 4 to 6 that CNL implements a radiation protection program, ascertain and record doses, and take the required actions in the case that an action level has been reached.
- The *Class I Nuclear Facilities Regulations* require that an application for a licence to operate a Class I nuclear facility contain the following information under paragraph:
 - 6(e), the proposed procedures for handling, storing, loading, and transporting nuclear substances and hazardous substances.
 - 6(h), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measure that will be taken to prevent or mitigate those effects.

Conventional Health and Safety

- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 3(f) that an application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain the proposed worker health and safety policies and procedures.
- The WL's activities and operations must comply with the [*Canada Labour Code, Part II: Occupational Health and Safety*](#).

Environmental Protection

- The *General Nuclear Safety and Control Regulations*, under paragraphs 12(1)(c) and (f) require that each licensee take all reasonable precautions to protect the environment and the health and safety of persons, and to control the release of radioactive nuclear substances and hazardous substances within the site of the licensed activity and into the environment.

- The [*Radiation Protection Regulations*](#) prescribe the dose limit for the general public, which under subsection 1(3) is 1mSv per calendar year.
- In addition, Sections 3 and 6 of the [*Class I Nuclear Facilities Regulations*](#) must be met by the applicant. The application for a licence shall contain under paragraph:
 - 3(e), the name, form, characteristics, and quantity of any hazardous substances that may be on the site while the activity to be licensed is carried on.
 - 3(g), the proposed environmental protection policies and procedures.
 - 3(h), the proposed effluent and environmental monitoring programs.
 - 6(e), the proposed procedures for handling, storing, loading, and transporting nuclear substances and hazardous substances.
 - 6(h), the effects on the environment and the health and safety of persons that may result from the operation and decommissioning of the nuclear facility, and the measures that will be taken to prevent or mitigate those effects.
 - 6(i), the proposed location of points of release, the proposed maximum quantities and concentrations, and the anticipated volume and flow rate of releases of nuclear substances and hazardous substances into the environment, including their physical, chemical, and radiological characteristics.
 - 6(j), the proposed measures to control releases of nuclear substances and hazardous substances into the environment.

Emergency Management and Fire Protection

- Paragraph 12(1)(c) of the [*General Nuclear Safety and Control Regulations*](#) states that every licensee shall “take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities, and of nuclear substances”.
- Paragraph 12(1)(f) of the *General Nuclear Safety and Control Regulations* states that every licensee shall “take all reasonable precautions to control the release of radioactive nuclear substances or hazardous substances within the site of the licensed activity and into the environment of the licensed activity...”.
- It is a requirement of the *Class I Nuclear Facilities Regulations* under paragraph 6(k) that a licence application contain information on CNL’s proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to:
 - Assist offsite authorities in planning and preparing to limit the effects of an accidental release.
 - Notify offsite authorities of an accidental release or the imminence of an accidental release.
 - Report information to offsite authorities during and after an accidental release.
 - Assist offsite authorities in dealing with the effects of an accidental release.

- Test the implementation of the measures to prevent or mitigate the effects of an accidental release.

Waste Management

- It is a requirement of the [General Nuclear Safety and Control Regulations](#) under paragraph 3(1)(j) that an application for a licence include the name, origin, quantity, form, and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste.

Security

- Paragraph 3(1)(e) of the *General Nuclear Safety and Control Regulations* requires that an application for a licence contains the proposed measures to ensure compliance with the *Radiation Protection Regulations*, the [Nuclear Security Regulations](#) and the *Packaging and Transport of Nuclear Substances Regulations, 2015*.
- Paragraph 12(1)(c) of the *General Nuclear Safety and Control Regulations* requires the licensee to take all reasonable precautions to protect the environment and the health and safety of persons and to maintain the security of nuclear facilities and of nuclear substances.
- Paragraph 6(k) of the [Class I Nuclear Facilities Regulations](#) requires that an application for a licence to operate a Class I nuclear facility contains the proposed measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances to the environment, the health and safety of persons and the maintenance of national security.
- Paragraph 2(a) of Part 1 of *Nuclear Security Regulations* states that Part 1 applies to Category I, II or III nuclear material.
- Subsection 24(5) of the [Nuclear Safety and Control Act](#) states that the licence may contain any term or condition that the Commission considers necessary for the purpose of the NSCA.

Safeguards and Non-Proliferation

- Subsection 24(5) of the *Nuclear Safety and Control Act* states that the licence may contain any term or condition that the Commission considers necessary for the purpose of the NSCA.
- Paragraph 12(1)(i) of the *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguard agreement.
- Paragraph 6(f) of the *Class I Nuclear Facilities Regulations* requires that an application for a licence to operate a Class I nuclear facility contains the proposed measures to facilitate Canada's compliance with any applicable safeguards agreement. The applicable safeguards agreements are:

- *Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* (INFCIRC/164); and
- *Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons* (INFCIRC/164/Add. 1).

Packaging and Transport

- CNL is required to comply with the [*Packaging and Transport of Nuclear Substances Regulations, 2015*](#), and Transport Canada's [*Transportation of Dangerous Goods Regulations*](#).

Cost Recovery

- Paragraph 24(2)(c) of the [*Nuclear Safety and Control Act*](#) requires that a licence application is accompanied by the prescribed fee.
- The [*Canadian Nuclear Safety Commission Cost Recovery Fees Regulations*](#) set out the specific requirements based on the activities to be licensed.

Financial Guarantee

- The [*General Nuclear Safety and Control Regulations*](#) requires under paragraph 3(1)(l) that a licence application contains a description of any proposed financial guarantee relating to the activity to be licensed.

Licensee Public Information Program

- It is a requirement of the [*Class I Nuclear Facilities Regulations*](#) under paragraph 3(j) that an application for a licence in respect of a Class I nuclear facility, other than a licence to abandon, shall contain information on the licensee's public information program.

B.2 Detailed Summary of CNSC Assessment of Application

CNSC's staff assessment of CNL's licence application included a completeness check, a sufficiency check, and a technical assessment against regulatory requirements. The completeness check verified whether the application included the prescribed information in accordance with the [Nuclear Safety and Control Act](#) and applicable regulations. For all facilities (i.e., Class I and Class II facilities), it is important to consider and address all licence application requirements within the applicable CNSC regulations.

The sufficiency check verified whether the application included sufficient and quality information in order for CNSC staff to conduct the technical assessment. The technical assessment verified whether the application included adequate safety and control measures to address CNSC requirements. Documents originally submitted as part of the application may have been revised, updated, or replaced over the course of the assessment to address CNSC requirements.

Pursuant to Section 3 of the General Nuclear Safety and Control Regulations Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by CNL	Complete?	Sufficient?	Adequate?
(1) An application for a licence shall contain the following information:				
(a) the applicant's name and business address;		Y	Y	Y
(b) the activity to be licensed and its purpose;		Y	Y	Y
(c) the name, maximum quantity, and form of any nuclear substance to be encompassed by the licence;		Y	Y	Y
(d) a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence;		Y	Y	Y

Pursuant to Section 3 of the <u>General Nuclear Safety and Control Regulations</u> Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by CNL	Complete?	Sufficient?	Adequate?
(e) the proposed measures to ensure compliance with the <u>Radiation Protection Regulations</u> , the <u>Nuclear Security Regulations</u> and the <u>Packaging and Transport of Nuclear Substances Regulations, 2015</u> ;		Y	Y	Y
(f) any proposed action level for the purpose of section 6 of the <u>Radiation Protection Regulations</u> ;		Y	Y	Y
(g) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment, or prescribed information;		Y	Y	Y
(h) the proposed measures to prevent loss or illegal use, possession, or removal of the nuclear substance, prescribed equipment, or prescribed information;		Y	Y	Y
(i) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;		Y	Y	Y

Pursuant to Section 3 of the General Nuclear Safety and Control Regulations Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by CNL	Complete?	Sufficient?	Adequate?
(j) the name, quantity, form, origin and volume of any radioactive waste or hazardous waste that may result from the activity to be licensed, including waste that may be stored, managed, processed, or disposed of at the site of the activity to be licensed, and the proposed method for managing and disposing of that waste;		Y	Y	Y
(k) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the [NSCA] and the regulations made under it, including the internal allocation of functions, responsibilities and authority;		Y	Y	Y
(l) a description of any proposed financial guarantee relating to the activity to be licensed;		Y	Y	Y

Pursuant to Section 3 of the General Nuclear Safety and Control Regulations Licences – General Application Requirements	Location in Application or Supporting Document(s) as Noted by CNL	Complete?	Sufficient?	Adequate?
(m) any other information required by the [NSCA] or the regulations made under it for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.		Y	Y	Y

B.3 Technical Basis

The technical basis for the recommendations presented in this CMD are listed in the table below:

CNL WL Applicable Standards and Codes per Safety and Control Area

SCA	Document Title	Sufficient?	Adequate?
Management System	REGDOC-2.1.2 (2018): <i>Safety Culture</i>	Y	Y
	CSA N286-12 (reaffirmed 2022): <i>Management System Requirements for Nuclear Facilities</i>	Y	Y
	CSA N286.6-98 (reaffirmed 2003): <i>Decommissioning Quality Assurance for Nuclear Power Plants</i>	Y	Y
	CSA N286.0.1-21: Commentary on N286-12, Management system requirements for nuclear facilities	Y	Y
Human Performance Management	REGDOC-2.2.4 (2017): <i>Fitness for Duty: Managing Worker Fatigue</i>	Y	Y
	REGDOC-2.2.4 (2021): <i>Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3</i>	Y	Y
	REGDOC-2.2.4 (2018): <i>Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical and Psychological Fitness</i>	Y	Y
	REGDOC-2.2.2 (2016): <i>Personnel Training, Version 2</i>	Y	Y
	REGDOC-2.2.5 (2019): <i>Minimum Staff Complement</i>	Y	Y
Operating Performance	REGDOC-3.1.2 (2018): <i>Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills</i>	Y	Y
Safety Analysis	REGDOC-2.4.4 (2022): <i>Safety Analysis for Class IB Nuclear Facilities</i>	Y	Y
	REGDOC-2.4.3 (2020): <i>Nuclear Criticality Safety</i>	Y	Y
	IAEA SSR-4 (2017): Safety of Nuclear Fuel Cycling Facilities	Y	Y
	IAEA TECDOC-1267 (2002): Procedures for Conducting Probabilistic Safety Assessment for Non-reactor Nuclear Facilities	Y	Y
	IAEA SSG-18 (2011): Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations	Y	Y

SCA	Document Title	Sufficient?	Adequate?
Physical Design	CSA N393-13 (R2018): <i>Fire protection for facilities that process, handle, or store nuclear substances</i>	Y	Y
	NRCC 56190 (2010 & 2015): <i>National Building Code of Canada</i>	Y	Y
	NRCC 56192 (2010 & 2015): <i>National Fire Code of Canada</i>	Y	Y
	CSA N285.0-17 (Update No.1): <i>General requirements for pressure-retaining system and components in CANDU nuclear power plants</i>	Y	Y
	CSA B51-14: <i>Boiler, Pressure Vessel and Pressure Piping Code</i>	Y	Y
	CSA N285.0.1-18: Commentary on CSA N285.0-17, General requirements for pressure-retaining systems and components in CANDU nuclear power plants	Y	Y
	REGDOC-2.5.1(2019): General Design Considerations: Human Factors	Y	Y
Fitness for Service	REGDOC-2.6.3 (2014): Aging Management	Y	Y
Radiation Protection	REGDOC-2.7.1 (2021), Radiation Protection	Y	Y
	REGDOC-2.7.2 (2021): Dosimetry, Volume I: Ascertaining Occupational Dose	Y	Y
Conventional Health and Safety	REGDOC-2.8.1 (2019), Conventional Health and Safety	Y	Y
Environmental Protection	REGDOC-2.9.1(2020): Environmental Principles, Assessments and Protection Measures, Version 1.2	Y	Y
	CSA N288.4-10 (R2015): Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	Y	Y
	CSA N288.5-11 (R2016): Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	Y	Y
	CSA N288.6-12 (R2017): Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	Full implementation Scheduled for October 2024	Full implementation Scheduled for October 2024

SCA	Document Title	Sufficient?	Adequate?
	CSA N288.7-15 (R2020): Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	Y	Y
	CSA N288.8-17 (R2022): Establishing and implementing action levels to control releases to the environment from nuclear facilities	Y	Y
	CSA N288.1-20: Guidelines for modelling radionuclide environmental transport, fate, and exposure associated with the normal operation of nuclear facilities.	Y	Y
	CSA N288.2-19: Guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents	Y	Y
Emergency Management and Fire Protection	REGDOC-2.10.1 (2016): Nuclear Emergency Preparedness and Response, Version 2	Y	Y
	CSA N393-13 (R2018): <i>Fire protection for facilities that process, handle, or store nuclear substances</i>	Y	Y
	NRCC 56190 (2010): <i>National Building Code of Canada</i>	Y	Y
	NRCC 56192 (2010): <i>National Fire Code of Canada</i>	Y	Y
	CSA N1600-21: <i>General requirements for nuclear emergency management programs</i>	Y	Y
Waste Management	REGDOC-2.11.1 (2021): Waste Management, Volume I: Management of Radioactive Waste	Y	Y
	REGDOC-2.11.1 (2021): Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	Y	Y
	CSA N292.0-19: General principles for the management of radioactive waste and irradiated fuel	Y	Y
	CSA N292.2-13 (R2018): Interim dry storage of irradiated fuel	Y	Y
	CSA N292.3-14: Management of low- and intermediate-level radioactive waste	Y	Y
	CSA N292.4-23: Storage of radioactive waste and irradiated fuel	Y	Y
	CSA N292.8-21: Characterization of Radioactive Waste and Irradiated fuel	Y	Y

SCA	Document Title	Sufficient?	Adequate?
	REGDOC-2.11 (2021): Framework for Radioactive Waste Management and Decommissioning Canada, Version 2	Y	Y
	CSA N292.5-11 (R2021): Guideline for the exemption or clearance from regulatory control of materials that contain or potentially contain, nuclear substances	Y	Y
Security	REGDOC-2.12.1 (prescribed information) (2018): High-Security Sites, Volume I: Nuclear Response Force, Version 2	Y	Y
	REGDOC-2.12.1 (prescribed information) (2018): High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	Y	Y
	REGDOC-2.12.2 (2013): Site Access Security Clearance	Y	Y
	REGDOC-2.12.3 (2020): Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	Y	Y
	CSA N290.7-14 (R2015): Cyber-security for nuclear power plants and small reactor facilities	Y	Y
	G-208 (2003): Transportation Security Plans for Category I, II or III Nuclear Material	Y	Y
	G-274 (2003): Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities	Y	Y
Safeguards and Non-Proliferation	REGDOC-2.13.1 (2018): Safeguards and Nuclear Material Accountancy	Y	Y
Packaging and Transport	IAEA SSR-6 Regulations for the Safe Transport of Radioactive Material (2018 Edition)	Y	Y
	RD-364 (2009): Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages	Y	Y
	REGDOC-2.14.1 (2021): Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2	Y	Y

C. Safety and Control Area Framework

C.1 Safety and Control Areas Defined

The safety and control areas discussed in section 4 are comprised of specific areas of regulatory interest which vary between facility types.

The following table provides a high-level definition of each SCA. The specific areas within each SCA are to be identified by the CMD preparation team in the respective areas within section 4 of this CMD.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	Safety and Control Area	Definition
Management	Management System	Covers the framework which establishes the processes and programs required to ensure an organization achieves its safety objectives and continuously monitors its performance against these objectives and fostering a healthy safety culture.
	Human Performance Management	Covers activities that enable effective human performance through the development and implementation of processes that ensure that a sufficient number of licensee personnel are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties.
	Operating Performance	Includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.
Facility and Equipment	Safety Analysis	Covers maintenance of the safety analysis that supports that overall safety case for the facility. Safety analysis is a systematic evaluation of the potential hazards associated with the conduct of a proposed activity or facility and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards.
	Physical Design	Relates to activities that impact on the ability of systems, components and structures to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	Safety and Control Area	Definition
	Fitness for Service	Covers activities that impact on the physical condition of systems, components and structures to ensure that they remain effective over time. This area includes programs that ensure all equipment is available to perform its intended design function when called upon to do so.
Core Control Processes	Radiation Protection	Covers the implementation of a radiation protection program in accordance with the <i>Radiation Protection Regulations</i> . This program must ensure that contamination levels and radiation doses received by individuals are monitored and controlled and maintained ALARA.
	Conventional Health and Safety	Covers the implementation of a program to manage workplace safety hazards and to protect workers.
	Environmental Protection	Covers programs that identify, control and monitor all releases of radioactive and hazardous substances and effects on the environment from facilities or as the result of licensed activities.
	Emergency Management and Fire Protection	Covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. This also includes any results of participation in exercises.
	Waste Management	Covers internal waste-related programs which form part of the facility's operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning.
	Security	Covers the programs required to implement and support the security requirements stipulated in the regulations, the licence, orders, or expectations for the facility or activity.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	Safety and Control Area	Definition
	Safeguards and Non-Proliferation	Covers the programs and activities required for the successful implementation of the obligations arising from the Canada/International Atomic Energy Agency (IAEA) safeguards agreements, as well as all other measures arising from the <i>Treaty on the Non-Proliferation of Nuclear Weapons</i> .
	Packaging and Transport	Covers programs for the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility.

C.2 Specific Areas for this Facility Type

The following table identifies the specific areas that comprise each SCA for the Whiteshell Laboratories site:

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	Safety and Control Area	Specific Areas
Management	Management System	<ul style="list-style-type: none"> ▪ Management System ▪ Organization ▪ Performance Assessment, Improvement and Management Review ▪ Operating Experience (OPEX) ▪ Change Management ▪ Configuration Management ▪ Records Management ▪ Management of Contractors
	Human Performance Management	<ul style="list-style-type: none"> ▪ Human Performance Programs ▪ Personnel Training ▪ Fitness for Duty
	Operating Performance	<ul style="list-style-type: none"> ▪ Conduct of Licensed Activity ▪ Procedures ▪ Reporting and Trending
Facility and Equipment	Safety Analysis	<ul style="list-style-type: none"> ▪ Deterministic Safety Analysis ▪ Hazard Analysis ▪ Criticality Safety
	Physical Design	<ul style="list-style-type: none"> ▪ Design Governance ▪ Site Characterization ▪ Facility Design ▪ Structure Design ▪ System Design ▪ Components Design
	Fitness for Service	<ul style="list-style-type: none"> ▪ Maintenance ▪ Structural Integrity

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	Safety and Control Area	Specific Areas
Core Control Processes	Radiation Protection	<ul style="list-style-type: none"> ▪ Application of ALARA ▪ Worker Dose Control ▪ Radiation Protection Program Performance ▪ Radiological Hazard Control ▪ Estimated Dose to Public
	Conventional Health and Safety	<ul style="list-style-type: none"> ▪ Performance ▪ Practices ▪ Awareness
	Environmental Protection	<ul style="list-style-type: none"> ▪ Effluent and Emissions Control (releases) ▪ Environmental Management System (EMS) ▪ Assessment and Monitoring ▪ Protection to the Public ▪ Environmental Risk Assessment
	Emergency Management and Fire Protection	<ul style="list-style-type: none"> ▪ Conventional Emergency Preparedness and Response ▪ Nuclear Emergency Preparedness and Response ▪ Fire Emergency Preparedness and Response
	Waste Management	<ul style="list-style-type: none"> ▪ Waste Characterization ▪ Waste Minimization ▪ Waste Management Practices ▪ Decommissioning Plans
	Security	<ul style="list-style-type: none"> ▪ Facilities and Equipment ▪ Response Arrangements ▪ Security Practices ▪ Drills and Exercises

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	Safety and Control Area	Specific Areas
	Safeguards and Non-Proliferation	<ul style="list-style-type: none">▪ Nuclear Material Accountancy and Control▪ Access and Assistance to the IAEA▪ Operational and Design Information▪ Safeguards Equipment, Containment and Surveillance
	Packaging and Transport	<ul style="list-style-type: none">▪ Package Design and Maintenance▪ Packaging and Transport▪ Registration for Use

D. Supporting Details

D.1 CNL WL Fire Protection Program Deficiencies 2023

1. Event Initial Report – June 2023 – ([CMD 23-M25](#))
2. Administrative Monetary Penalty – October 2023 ([2023-AMP-04](#))

D.2 Previous CNL WL CMDs and Related Documents

1. Whiteshell Laboratories Licence Renewal (NRTEDL-W5-8.05/2019) – ([CMD 19-H4](#))
2. [Record of Decision](#) - Canadian Nuclear Laboratories Ltd. - Application for the Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for Whiteshell Laboratories
3. Canadian Nuclear Laboratories Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2018 – ([CMD 19-M24](#))
4. Canadian Nuclear Laboratories Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2019 – ([CMD 20-M22](#))
5. Canadian Nuclear Laboratories Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2020 – ([CMD 21-M32](#))
6. Canadian Nuclear Laboratories Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2021 – ([CMD 22-M33](#))
7. Canadian Nuclear Laboratories Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2022 – ([CMD 23-M30](#))

E. Inspections

The following table includes Type II inspections conducted at WL during the licence period.

Date	SCAs Covered
June 6-7, 2019	Packaging and Transport
August 6-8, 2019	Emergency Management and Fire Protection
August 26-28, 2019	Security
March 1-4, 2021	Human Performance
April 19-22, 2021	Management System
September 15-16, 2021	Fitness for Service Radiation Protection Operating Performance Conventional Health and Safety Emergency Management and Fire Protection
September 27-29, 2021	Security
May 10-11, 2022	Radiation Protection
October 24-26, 2022	Waste Management Fitness for Service Operating Performance
September 14-16, 2022	Security
March 21-23, 2023	Environmental Protection
August 22-24, 2023	Emergency Management and Fire Protection
October 24, 2023	Emergency Management and Fire Protection – Fire Response Drill
December 5-6, 2023	Human Performance Management
March 25-28, 2024	Management System
April 22-25, 2024	Management System Human Performance Management Operating Performance Safety Analysis Emergency Management and Fire Protection
April 22-25, 2024	Emergency Management and Fire Protection – Fire Response Drill

F. ENVIRONMENTAL PROTECTION REVIEW REPORT

e-Doc 7094099 (Word)

e-Doc 7268017 (PDF)



Environmental Protection Review Report: **Whiteshell Laboratories**

July 2024

e-Doc: 7094099 (Word)

e-Doc: 7268017 (PDF)



Environmental Protection Review Report: Whiteshell Laboratories

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Revision History

The following table identifies the revision history of this document.

Revision number	Change	Summary of changes	Date
000	Initial release	N/A	July 2024
001			

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Executive summary

The Canadian Nuclear Safety Commission (CNSC) conducts environmental protection reviews (EPRs) for all nuclear facilities with potential interactions with the environment, in accordance with its mandate under the *Nuclear Safety and Control Act* (NSCA) to ensure the protection of the environment and the health and safety of persons. An EPR is an evidence-based environmental technical assessment conducted by CNSC staff. The fulfillment of other aspects of the CNSC's mandate is met through other oversight activities.

This EPR report was written by CNSC staff for the Commission, Indigenous Nations and communities and the public. It describes the scientific, evidence-based findings from CNSC staff's review of the application by Canadian Nuclear Laboratories' (CNL) to renew the Whiteshell Laboratories (WL) site current Nuclear Research and Test Establishment Decommissioning licence, NRTEDL-W5 8.00/2024, in order to continue planned decommissioning activities at the WL site, including the decommissioning of the Concrete Canister Storage Facility, Waste Management Area, Shielded Facilities and other remaining buildings and infrastructure at the WL site. The WL site is situated in the homeland of the Red River Métis, Treaty 1 and Treaty 3 territories and the traditional territory of the Anishinaabe and Ojibway Peoples. The WL site is also located in the vicinity of Treaty 5 territory. The WL site is within the district of Pinawa, Manitoba approximately 100 kilometres (km) northeast of the city of Winnipeg, on the bank of the Winnipeg River.

This EPR report provides an assessment of documents related to the WL site, which consists of the main research campus and the waste management area. This EPR report does not consider CNL's proposed *in-situ* decommissioning of the Whiteshell Reactor #1 (WR-1) project, which is undergoing a separate regulatory review process under both the *Canadian Environmental Assessment Act, 2012* and the NSCA. Hence, the proposed *in-situ* strategy to decommission the WR-1 facility is outside the scope of this EPR report.

CNSC staff's EPR report focuses on items that are of Indigenous, public, and regulatory interest, such as environmental releases from normal operations, as well as the risk of releases of radiological and hazardous (non-radiological) substances to the receiving environment.

Typically, an EPR report includes a section describing the environment surrounding the licensed nuclear site to assess the potential effects on the different components of the environment as a result of exposure to contaminants detailed in a licensee's environmental risk assessment (ERA).

At the time of writing this report, a site-wide ERA has not been accepted by CNSC staff. CNL is currently working to address technical comments from CNSC and Environment and Climate Change Canada staff. CNL will resubmit a revised site-wide ERA for CNSC staff acceptance prior to the WL site licence renewal hearing in October 2024. Although acceptance of the site-wide ERA remains outstanding, CNSC staff's review to date of the submitted ERA and supporting documentation (e.g., annual compliance reports, CNSC Independent Environmental Monitoring Program (IEMP) results and other environmental monitoring programs) indicates that there is low risk to the environment, there are adequate measures to protect members of the public and/or Indigenous nations and communities from legacy contamination and operational activities on the WL site.

Upon CNSC staff's acceptance of CNL's ERA, this EPR report will be revised to include the assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities as assessed in the ERA.

This EPR report includes CNSC staff's assessment of documents submitted by the licensee to CNSC staff from 2016 to 2022 and the results of CNSC staff's compliance activities, including the following:

- the results of CNL's environmental monitoring, as reported in the environmental monitoring program (EMP) reports
- CNL's detailed decommissioning plan for the WL site
- CNL's draft WL side-wide ERA
- the results of the CNSC's [IEMP](#)
- the results from other EMP and health studies (including studies completed by other levels of government and Indigenous Nations and communities) in proximity to the WL site

The information provided in this EPR report supports the findings presented by CNSC staff in Commission member document (CMD) 24-H7. Based on their assessment and evaluation of CNL's documentation and data, CNSC staff have found that the radiological and hazardous releases to environment surrounding the WL site is protected. Furthermore, human health is not impacted by operations at the WL site and the health outcomes are indistinguishable from health outcomes found in the general public. CNSC staff also found that CNL continues to implement and maintain effective environmental protection measures that meet regulatory requirements and adequately protect the environment and the health and safety of persons. CNSC staff will continue to verify CNL's environmental protection programs through ongoing licensing and compliance activities. Should the Commission decide to renew CNL's licence for the WL site, CNSC staff will continue to verify and evaluate, through ongoing licensing and compliance activities, that the environment and the health of persons are protected and will continue to be protected over the proposed licence period.

CNL makes many summary documents, including reports containing environmental data, available on [CNL's website](#) (external). References used throughout this document are available upon request and requests can be sent to er-ee@cnscccsn.gc.ca.

1.0 Introduction

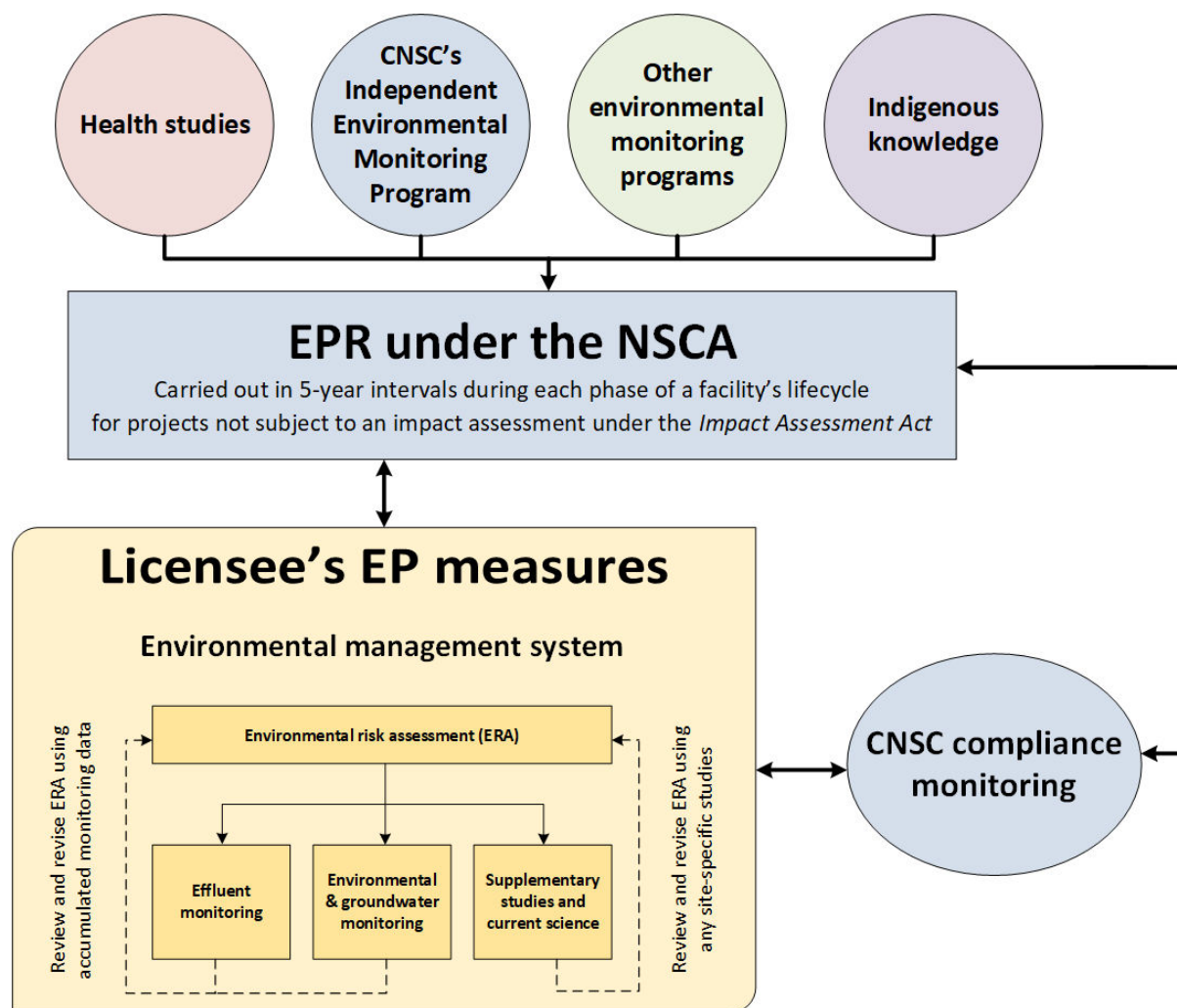
1.1 Purpose

The Canadian Nuclear Safety Commission (CNSC) conducts environmental protection reviews (EPRs) for all nuclear facilities with potential interactions with the environment, in accordance with its mandate under the *Nuclear Safety and Control Act* (NSCA) [1]. CNSC staff assess the environmental and health effects of nuclear facilities and/or activities during every phase of a facility's lifecycle. As shown in figure 1.1, an EPR is an evidence-based environmental technical assessment conducted by CNSC staff to support the CNSC's mandate for the protection of the environment and human health and safety, as set out in the NSCA. The fulfillment of other aspects of the CNSC's mandate is met through other regulatory oversight activities and can be found in CNSC staff Commission Member Document (CMD) 24-H7 [2].

Each EPR report is typically conducted every 5 years and is informed by the licensee's environmental protection (EP) program and documentation submitted by the licensee as per regulatory reporting requirements.

As per the CNSC's [Indigenous Knowledge Policy Framework](#) [3], the CNSC recognizes the importance of considering and including Indigenous Knowledge in all aspects of its regulatory processes, including EPRs. CNSC staff are committed to working directly with Indigenous Nations and communities and knowledge holders on integrating their knowledge, values, land use information, programs and perspectives in the CNSC EPR reports, where appropriate and when shared with the licensee and the CNSC.

The purpose of this EPR is to report the outcome of CNSC staff's assessment of Canadian Nuclear Laboratories' (CNL's) EP measures and CNSC staff's health science and environmental compliance activities for the Whiteshell Laboratories (WL) site. This review serves to assess whether CNL's EP measures at the WL site meet requirements and adequately protect the environment and the health and safety of persons.

Figure 1.1: Environmental protection review framework

This EPR report was written by CNSC staff for the Commission, Indigenous Nations and communities and the public. It describes the scientific, evidence-based findings from CNSC staff's review of the application by CNL to renew the Whiteshell Laboratories site (WL) current Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5 8.00/2024.

EPR reports are prepared to thoroughly document CNSC staff's technical assessment relating to a licensee's EP measures and are posted online for information and transparency. Posting EPR reports online, separately from the documents drafted during the licensing process, allows interested Indigenous Nations and communities and members of the public additional time to review information related to EP prior to any licensing hearings or Commission decisions. CNSC staff may use the EPR reports as reference material when engaging with interested Indigenous Nations and communities, members of the public, and interested stakeholders.

This EPR report is informed by documentation and information submitted by CNL, compliance activities completed by CNSC staff from 2016 to 2022, and other sources, such as:

- regulatory oversight activities (section 2.0)

- CNSC staff's review of CNL's detailed decommissioning plan (DDP) for the WL site [4] (section 2.2)
- CNSC staff's review of CNL's annual compliance monitoring reports for EP at the WL site [5] [6]
- results of the CNSC's [Independent Environmental Monitoring Program](#) (IEMP) [7], including discussions with Indigenous Nations and communities (section 4.0)
- health studies with relevance to the WL site (section 7.0)
- results from Indigenous Nations, Métis and other federal EMPs in proximity to the WL site (sections 5.0 and 6.0)

Typically, an EPR report includes a section describing the environment surrounding the licensed nuclear site to assess the potential effects on the different components of the environment as a result of exposure to contaminants detailed in a licensee's ERA. At the time of writing this report, a site-wide ERA has not been accepted by CNSC staff. CNL is currently working to address technical comments from CNSC and Environment and Climate Change Canada staff. CNL will resubmit a revised site-wide ERA for CNSC staff acceptance prior to the WL site licence renewal hearing in October 2024. Although acceptance of the site-wide ERA remains outstanding, CNSC staff's review to date of the submitted ERA and supporting documentation (e.g., annual compliance reports, CNSC Independent Environmental Monitoring Program (IEMP) results and other environmental monitoring programs) indicates that there is low risk to the environment, there are adequate measures to protect members of the public and/or Indigenous nations and communities from legacy contamination and operational activities on the WL site. Upon CNSC staff's acceptance of CNL's ERA, this EPR report will be revised to include the assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities as assessed in the ERA.

The focus of this report is on radiological and hazardous substances associated with licensed activities undertaken at the WL site, with additional information provided on other topics of Indigenous, public, and regulatory interest. CNSC staff also present information on relevant regional environmental and health monitoring, including studies conducted by the CNSC or other governmental organizations and Indigenous Nations and Métis communities.

1.2 Site overview

This section provides general information on the WL site, including a description of the site location and a basic history of site activities and licensing. This information is intended to provide context for later sections of this report, which discuss completed and ongoing environmental and associated regulatory oversight activities.

1.2.1 Site description

The WL site is located in the homeland of the Red River Métis, Treaty 1 and Treaty 3 territories and the traditional territory of the Anishinaabe and Ojibway Peoples. The WL site is also located in the vicinity of Treaty 5 territory.

The WL site is located between the towns of Lac du Bonnet (8km to the north) and Pinawa (10km to the east) within a rural area of Manitoba (figure 1.2) and is approximately 100 kilometres (km)

northeast of the city of Winnipeg. Most of the WL site is situated on the east bank of the Winnipeg River, but the site does extent across the river to the west bank, although that portion of the site is undeveloped (figure 1.3). Collectively, the infrastructure at the WL site covers approximately 100 hectares (ha) to the east of the Winnipeg River, with the majority of the infrastructure located within the main campus at the WL site (figure 1.4). Pinawa Provincial Park and a privately-owned shooting range are also in close proximity to the WL site.

Historically owned and operated by Atomic Energy Canada Limited (AECL) and comprised of over 4,000 (ha) of land, the WL site was established in the 1963 in order to conduct nuclear research activities. In 1998, AECL announced the closure of the WL site and decommissioning activities have been underway since. In 2014, with the implementation of a government-owned, contractor-operated model, AECL transferred the operations of the WL site to CNL.

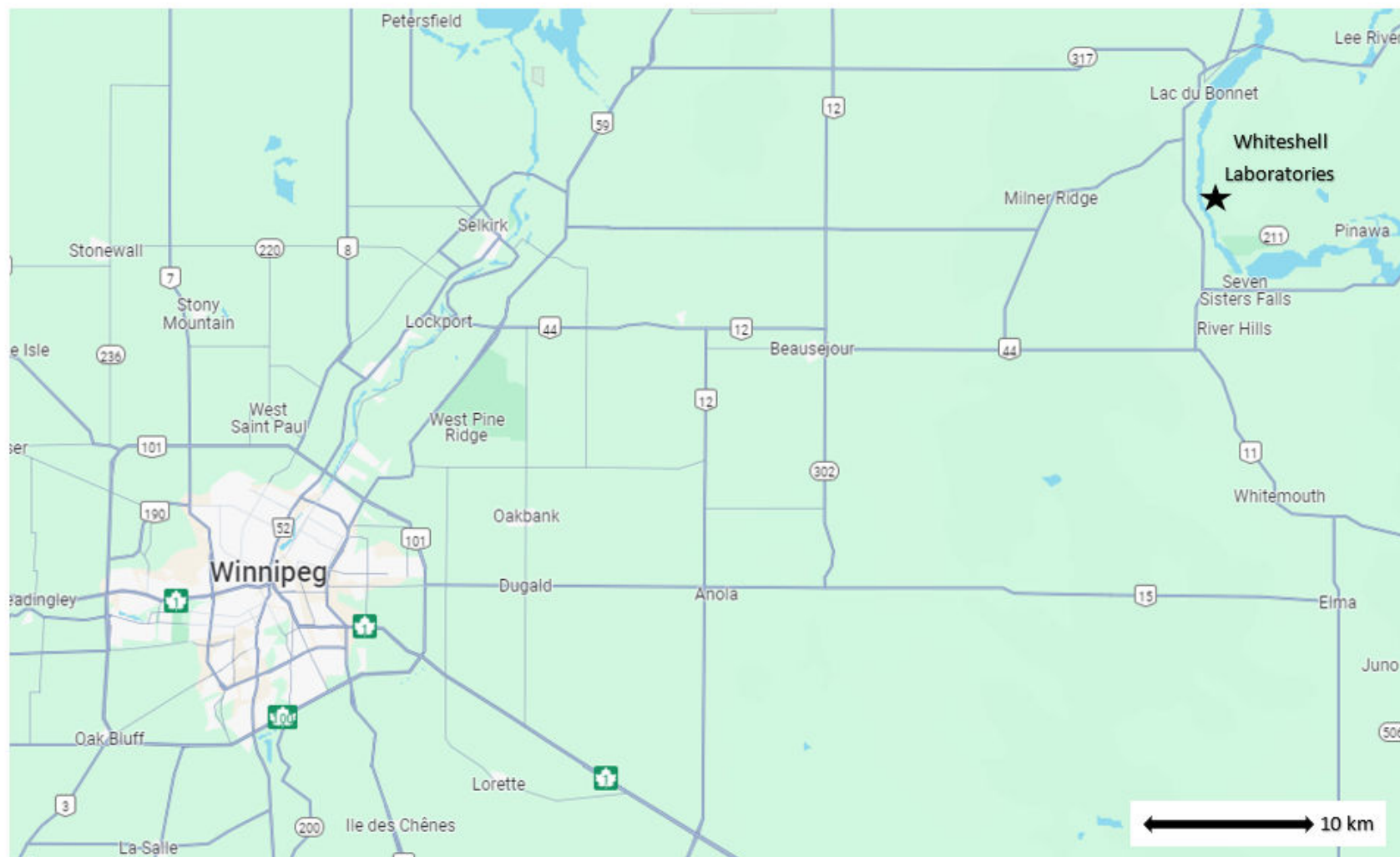
Figure 1.2: Location of Whiteshell Laboratories [8]

Figure 1.3: Aerial view of the WL site [9]

Figure 1.4: Aerial view of the main campus at the WL site [10]



1.2.2 Site operations

The WL site, originally the Whiteshell Nuclear Research Establishment, was Canada's second nuclear science research site and focused on research related to organically cooled, heavy water moderated nuclear reactors (of which the WR-1 was the largest in the world). The scope of research at the site expanded and diversified through the years to include research on SLOWPOKE reactors and nuclear waste, among other areas. The list below provides information on some of the original structures and current state of operation.

- **Active Liquid Waste Treatment Center (ALWTC), Building (B) 200:** Historically used for receiving low-level liquid waste effluent (transferred from WR-1, research laboratories in B300, and laundry/decontamination via underground piping), as well as processing and solidification of medium-level liquid waste (concentrating waste steam originating from the Shielded Facility (SF) building), which was eventually transported to and stored in the Waste Management Area (WMA). This facility is being decommissioned.
- **Concrete Canister Storage Facility (CCSF):** Used as part of the Concrete Canister Fuel Storage Program in order to demonstrate dry storage as a feasible alternative to water pool storage for irradiated reactor fuel, and eventually to store remaining used fuel from the WR-1 reactor. This facility is operational.
- **Decontamination Centre, B411:** Used to provide decontamination services for equipment and tools, including laundry services for radioactively contaminated clothing. This facility has been decommissioned.
- **Neutron Generator Facility, B300:** Originally located in the Research and Development Complex, this facility was used in the development of methods for the assay of fissile and fertile materials in reactor fuels and components, and eventually fast neutron activation analysis. This facility has been decommissioned.
- **Sewage Lagoon:** The Lagoon is comprised of a primary settling pond and a secondary pond (connected via a culvert), an outlet and a sewage lift station (B907), constructed of low permeability clay embankments placed on a prepared clay surface. The Lagoon was historically used to receive liquid wastes from lavatories, showers, and non-active drains. It is located just north of the main laboratory site. This facility is operational.
- **Shielded Facility (SF), B300:** Also located in the Research and Development Complex and comprised of the Hot Cells facility, the SF was used to provide shielded, remote handling facilities in support of the CANDU Reactor Safety research programs and other activities involving radioactive materials. The Immobilized Fuel Test Facilities were used for experiments involving radioactive materials, in support of the Canadian Nuclear Fuel Waste Management and CANDU Reactor Safety research programs. This facility is operational and decommissioning activities are ongoing.
- **Van de Graff Accelerator Facility, B300 (four rooms):** This facility housed the accelerator, a target room, and a control room. The Van de Graff Accelerator operated from 1970 to 1997. This facility has been decommissioned.
- **Waste Management Area (WMA):** Used for storage of low-level radioactive wastes (LLW) and intermediate-level radioactive wastes (ILW), irradiated fuel waste, high-level wastes (HLW), and other hazardous chemicals, the WMA includes a variety of buildings,

unlined earth trenches, in-ground concrete bunkers and other storage bunkers, concrete standpipes, and amine storage tanks (see figure 3.3 in section 3.2.4). This facility is operational.

- **Whiteshell Reactor #1 (WR-1), B100:** Used from 1965 to 1985 to demonstrate the organic-cooled reactor concept, using heavy water as the moderator. The facility was also used for engineering tests on fuels, fuel channels, and reactor coolants. After shutdown in 1985, the reactor was defueled and placed in a safe, secure, shutdown state. The irradiated fuel from WR-1 is currently stored in the CCSF. As described in section 1.2.3, the environmental assessment for the proposed *in-situ* decommissioning of the WR-1 reactor is on-going and out of scope for this EPR report.

1.2.3 Decommissioning overview

An initial strategy for decommissioning was developed for the WL site [11] following AECL's 1997 decision to discontinue operations at the WL site. The proposed strategy included the following stages:

- **Decontamination and clean up:** Bringing nuclear and radioisotope buildings and facilities into a safe, secure, interim end state and completely decommissioning the Van de Graaf Accelerator and Neutron Generator.
- **Storage-with-Surveillance:** Conducting monitoring and surveillance of remaining buildings and facilities, placing most waste management facilities in the WMA into a passive control state, as well as establishing interim processing, handling, and storage facilities (required for monitoring, surveillance, and decommissioning project activities).
- **Final decommissioning:** Completely decommissioning the WL site to the final end state. During this stage, infrastructure refurbishment and rebuilding were expected to be required, in order to maintain the facilities under monitoring and surveillance.

This strategy explained that a safety case for the *in-situ* disposal of 21 LLW trenches in the WMA and river sediments downstream of the Process Outfall would be provided to and assessed by the CNSC at a future date [11]. These activities were also expected to be followed by a 100-year period of institutional control, during which performance of any *in-situ* disposal components would be monitored and controlled by CNL, with regulatory oversight by the CNSC [11] [12].

In April of 2002, AECL submitted an application to the CNSC to replace their existing nuclear research and test establishment operating licence (NRTEOL) with a 6-year decommissioning licence, in order to begin implementing their proposed decommissioning strategy. In a two-part public hearing, held on September 12th and November 14th of the same year, the Commission considered submissions from intervenors, CNSC staff and AECL, including the *Whiteshell Laboratories Decommissioning Project Comprehensive Study Report* [11] which was produced in accordance with the EA requirements under the *Canadian Environmental Assessment Act, 1992* (CEAA 1992) [13] (see section 2.2 for more information on this EA). The Commission accepted CNSC staff recommendations and concluded that the approved activities to be carried out under the initial licence would result in the safe shutdown of facilities and gathering of information necessary for the planning, preparation, and assessment of future decommissioning activities. In 2003, the Commission granted a Nuclear Research and Test Establishment Decommissioning Licence (NRTEDL) that was valid until December 31, 2008 [14].

In April of 2008, AECL submitted an application to renew this decommissioning licence for a 10-year licence period, in order to complete ongoing decommissioning activities, based on an accelerated schedule. Although the original decommissioning plan had not been fundamentally altered, deferment periods¹ had been eliminated wherever possible, allowing AECL to reduce the number of years for storage-with-surveillance activities. In a public hearing held on November 5th of the same year, the Commission renewed the WL site NRTEDL from January 1, 2009, until December 31, 2018 [15].

Following the restructuring of AECL in 2014, several administrative changes were made to the NRTEDL. In November 2014, the licence was transferred to CNL from AECL. In January 2016, the address of the facility was changed, and a new licence in the updated licence format and a Licence Condition Handbook (LCH) were issued to CNL. No changes to authorized activities were introduced in the updated licence or LCH.

In May 2016, the CNSC received a project description from CNL proposing an alternative strategy (*in-situ*) to decommissioning the WR-1 reactor, to the existing decommissioning strategy of dismantlement. The CNSC determined that the proposed project to *in-situ* decommission the WR-1 reactor would require a federal EA, pursuant to *Canadian Environmental Assessment Act, 2012* (CEAA 2012) [16]. The official public record of this EA process can be found on the Canadian Impact Assessment Registry website (reference no: [80124](#)) [17]. The regulatory review process for the proposed *in-situ* strategy under the CEAA 2012 and the NSCA are still underway. The proposed *in-situ* strategy for the WR-1 project is thus out of scope from this licence renewal.

In November 2018, CNL requested to renew the WL site NRTEDL for a period of 10 years, from January 1, 2020, to December 31, 2029 [18]. The Commission held a public hearing on October 2-3, 2019, in Lac du Bonnet, Manitoba and on December 19, 2019, the Commission renewed the WL NRTEDL for a 5-year period, from January 1, 2020, until December 31, 2024 [19].

2.0 Regulatory oversight

The CNSC regulates nuclear facilities and activities in Canada to protect the environment and the health and safety of persons in a manner that is consistent with applicable legislation and regulations, environmental policies, and Canada's international obligations. The CNSC assesses the effects of nuclear facilities and activities on people and the environment during every phase of a facility's lifecycle. This section of the EPR report discusses the CNSC's regulatory oversight of CNL's EP measures for the WL site.

To meet the CNSC's regulatory requirements and according to the licensing basis for the WL site, CNL is responsible for implementing and maintaining EP measures that identify, control, and (where necessary) monitor releases of radiological and hazardous substances and their effects on people and the environment. These EP measures must comply with, or have implementation plans in place to comply with, the regulatory requirements found in CNL's licence and licence condition handbook (LCH). The relevant regulatory requirements for CNL's WL site are outlined in this section of the report.

¹ A period of monitoring and surveillance when no significant decommissioning work is in progress.

2.1 Environmental protection reviews and assessments

To date, one federal environmental assessment (EA) and two EPRs (including this one) have been carried out for the decommissioning of the WL site, as indicated in table 2.1. Subsection 2.1.1 provides a description of the EAs conducted under the CEAA 1992 [13], predecessor to the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) [16]. Subsection 2.1.2 provides information on the EPRs conducted for the WL site. In 2019, the *Impact Assessment Act of Canada* (IAA) [20] came into force, replacing CEAA 2012. CNL's current activities at the WL site and the renewal of the WL NRTEDL do not require an impact assessment under the IAA's [Physical Activities Regulations](#) [21]. The purpose of any one of these legislations and assessments is to identify the possible impacts of a proposed project or activity and to determine whether those effects can be adequately mitigated to protect the environment and the health and safety of persons.

Table 2.1: Federal environmental assessments and environmental protection reviews completed for the WL site

Project	Applicable EA process and/or legislation	EA or EPR start date	EA decision date
Whiteshell Laboratories Decommissioning Project	EA as per CEAA 1992	1999	2002
Whiteshell Laboratories EPR Report for 2019 Licence Renewal	EPR as per the NSCA	2019	N/A

2.1.1 Previous environmental assessment completed under the *Canadian Environmental Assessment Act*

Under the former CEAA 1992 [13], an EA was conducted for the currently licensed decommissioning activities at the WL site. In 1999, AECL began to prepare plans for decommissioning of the facilities located on the WL site, and as described in section 1.2, later applied to the CNSC for a decommissioning licence. The CNSC determined that a comprehensive study EA was required under CEAA 1992. This EA was carried out by the CNSC and the Department of Fisheries and Oceans Canada (DFO), who were designated as responsible authorities under this former Act.

A document outlining the scope of the project and requirements of the assessment was issued by the CNSC in December 1999, following consultation activities with the public and other federal and provincial government departments. In 2001, the Whiteshell Laboratories Decommissioning Project Comprehensive Study Report (CSR) [11] was produced by AECL, in accordance with the requirements of the EA process.

In 2002, following CNSC and DFO staff findings that all the CEAA 1992 requirements had been adequately fulfilled, the Minister of the Environment determined that the project was not likely to cause significant adverse environmental effects, taking into account the implementation of

mitigation measures. The Commission rendered a licensing decision in December 2002, and a decommissioning licence was granted for the WL site [22].

The EA process identified the need for an EA follow-up program [23] designed to validate the predicted environmental effects and effectiveness of the mitigation measures. Further details of the EA follow-up program are provided in section 2.1.3.

2.1.2 Previous environmental protection reviews completed under the *Nuclear Safety and Control Act*

In 2018, CNL applied to the CNSC to renew the WL Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5-8.05/2019, which was scheduled to expire on December 31, 2019. CNL requested a renewal of the licence for a period of ten years to continue with previously authorized decommissioning activities.

CNSC staff prepared an EPR report as per the NSCA for this licence renewal [24]. This EPR report included CNSC staff's assessment of the licence application, the documents submitted as part of the licensing and regulatory requirements, as well as the results of previous studies, compliance verification activities conducted at the WL site (including inspections, audits, reviews), and the results of the CNSC's IEMP.

CNSC staff found that CNL had made and would continue to make adequate provisions for the protection of the environment and the health and safety of persons. A public Commission hearing was held from October 2 to 3, 2019 in Lac du Bonnet, Manitoba. On December 19, 2019, the Commission renewed the WL's NRTEDL for a period of 5 years [19].

2.1.3 Current environmental assessment follow-up program

In May 2002, CNL submitted a draft EA follow-up program [23] for the WL site to the CNSC and DFO. Following incorporation of feedback from both responsible authorities, the program was finalized in June 2002. AECL submitted annual progress reports on the EA follow-up program since its 2002 approval and this commitment has been continued by CNL since 2015. Information collected through the EA follow-up program is being used to help verify the accuracy of the CSR [11] and confirm that appropriate mitigation measures are taken. The EA follow-up program will remain in place for the duration of decommissioning activities at the WL site.

The objectives of the EA follow-up program are as follows:

- verify the accuracy of the EA
- determine the effectiveness of any mitigation measures that have been implemented
- optimize the monitoring and surveillance program at the WL site
- confirm that appropriate mitigation measures are implemented
- develop appropriate responses to unforeseen events
- identify effects of the project that may not have been predicted

Achievement of these objectives continues to be accomplished using monitoring, surveillance, and inspection activities at the WL site, which are supported by planning, data collection, analysis, evaluation, and reporting. The program is structured around nine themes of work, referred to as

work packages. These work packages are shown in table 2.2, along with the associated work tasks and overall status.

Figure 2.2: Environmental assessment follow-up program elements and status [25]

#	Work package	Component	Description	Completed activities and status
1	Routine environmental monitoring program (EMP)	Environmental	Establishment of an EMP in order to confirm the CSR EA conclusions, as well as ensure remediation measures are effective throughout all phases.	Monitoring has continued over the entirety of the project life-cycle, and these activities are ongoing. As decommissioning activities continue, this program adapts as needed.
2	Air and meteorology	Environmental	Collection of monitoring data, in order to establish a site baseline, as well as ongoing collection and monitoring of data (during building demolition), in order to ensure effectiveness of mitigation measures, and that environmental effects remain insignificant.	Monitoring stations related to air and meteorology were established, collection of baseline data has been completed, and various buildings have been demolished. The collection of data and monitoring continues.
3	Fitness for service (FFS) of WMA Facilities	Interim Storage and End state Support	An initial assessment of the fitness-for-service of structures where storage would continue during decommissioning activities, including validation of facility integrity and geological/hydrogeological conditions around facilities.	Various activities have been completed, including: confirmation of structural integrity of buildings, evaluation of potential impact of containment transport from individual storage facilities / areas, establishment of remediation criteria related to containment transport impacts, relative to waste removal to final disposal. CNL continues to evaluate potential impacts of containment transport from storage facilities and areas, as well as remediation requirements and timeframes, where appropriate.
4	Confirmation of hydrogeological conditions at the WMA	Interim Storage and End state Support	Enhanced hydrogeological monitoring in order to evaluate fitness-for-service of interim storage structures, as well as collect detailed information needed in order to develop safety case for <i>in situ</i> disposal of LLW trenches.	Detailed planning for enhanced monitoring system completed. Although many activities have been completed, installation and refurbishment of monitoring wells, evaluation and reporting on interim storage environment, as well as monitoring and data collection for the safety analysis to support LLW <i>in situ</i> end state are all ongoing.

5	Interim remediation of WMA Facilities	Interim Storage and End state Support	Interim remediation plans for structures and areas of the site where facility life-cycle would not be adequate to manage the wastes.	The following activities are and have been ongoing: recovery of, processing, packaging and provision of enhanced interim storage of irradiated fuel (from standpipes), and other wastes; retrieval of LLW from trenches not suitable for <i>in situ</i> disposal (irradiator reactor components in trench #6, soil and waste contaminated by WR-1 waste water in trench #10, arsenic from trench #1 and others).
6	Inactive Landfill Enhanced Monitoring	Interim Storage and End state Support	Enhanced monitoring in order to confirm the integrity of hydrogeological environment, control groundwater impacts and collect data in preparation for site closure.	Detailed planning for enhanced monitoring system completed, along with installation and refurbishment of monitoring wells. Evaluation of interim storage environment, monitoring and data collection, as well as preparation of a closure plan will continue over the decommissioning period.
7	Sewage Lagoons Enhanced Monitoring	Interim Storage and End state Support	Enhanced monitoring in order to confirm compliance of discharges, assess impacts to groundwater and the Winnipeg River, as well as development of a closure plan.	Detailed planning for enhanced monitoring system completed, along with establishing sampling locations. Monitoring and collection of data, compliance evaluation, assessment of groundwater impacts, as well as preparation of a closure plan are all ongoing.
8	River Sediments Enhanced Monitoring	Interim Storage and End state Support	Enhanced monitoring of river sediments in order to ensure the CSR assessment remains valid, as decommissioning activities continue.	Identification of depositional areas above the hydroelectric dam sites for core sampling completed, agreement signed with DFO and CNSC for target sampling locations, as well as collection and analyzation of Caesium-137, following which a baseline was established. Re-sampling will continue at 20, 40, and 60 year marks (years 2026, 2046 and 2066, respectively), in order to validate CSR conclusions.
9	Establish and maintain project communications mechanisms	Public communication	Interactive public communication activities in order to continue communications with stakeholders, including municipal governments, Indigenous people, other interested parties and members of the public in the WL site region.	Communication contact list was assembled and verified, input was solicited from stakeholders in the contact list, in order to establish formal and informal communication measures and communication processes, based on this feedback. Communications will be ongoing for the remainder of project activities.

CNSC staff continue to review the WL site follow-up activities, in order to ensure that the EA follow-up program objectives are being met. To date, CNL has continued to implement follow-up activities as required. The EA follow-up program elements associated with the monitoring of emissions and effluent or with the receiving environment are incorporated within the environmental management program at the WL site, as needed.

2.2 Planned end-state

Decommissioning activities for research and test facilities such as those at the WL site are regulated by the CNSC. This sub-section provides high-level information with respect to the detailed decommissioning plan (DDP) for the WL site.

The purpose of decommissioning plans is to document:

- the decommissioning strategy and end-state objectives
- the major decontamination, disassembly, and remediation steps
- the approximate quantities and types of waste generated
- an overview of the principal hazards and protection strategies
- an estimate of cost

As a full lifecycle regulator, the CNSC will continue to monitor and remain aware of the end state of the WL site. As decommissioning activities are completed, they are expected to result in a decrease in both radiological and hazardous releases to the environment, as the WL site reaches its eventual end state. As per the most recently approved Whiteshell Laboratories Detailed Decommissioning Plan: Volume 1 – Program Overview [4], completion of decommissioning activities is currently planned for 2027, however the completion date is currently under review by CNL.

An overview of the decommissioning strategy for the entire WL site is documented in the DDP Volume 1, along with 11 subsequent facility specific volumes, each addressing facilities, buildings and areas at the WL site in more detail. Refer to the CMD 24-H7 [2], section 4.11, Waste Management SCA for more information on CNSC staff's review of the WL site DDP.

CNL is planning, implementing, and completing decommissioning activities, in accordance with the DDP. Revisions to the program overview are currently underway, and subsequent volumes are developed when so required by CNL. Through analysis of these plans, staff can provide a high-level assessment of how the project and associated environmental interactions will change over time.

2.3 Environmental regulatory framework and protection measures

The CNSC has a comprehensive EP regulatory framework which includes the protection of people and the environment and considers both radiological nuclear and hazardous substances, as well as physical stressors (such as noise). The focus of this section of the EPR report is on the EP regulatory framework and the status of CNL's environmental protection program (EPP) for the WL site. The results derived from the EPP are detailed in section 3.0 of this report.

CNL's EPP for the WL site was designed and implemented in accordance with REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* (2017) [26] as well as the Canadian Standards Association (CSA) Group's environmental protection standards listed below. The implementation status for these items is shown in Table

2.3. The EPP includes environmental risk assessment, effluent and/or emission monitoring, environmental monitoring, and other environmental protection measures discussed further in section 2.3.4.

Table 2.3: Status of EP measures to implement regulatory documents and standards

Regulatory document or standard	Status
CSA N288.1-14, <i>Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities</i> [27]	Implemented
CSA N294-09 (reaffirmed 2014), <i>Decommissioning of Facilities Containing Nuclear Substances</i> [28]	Implemented
CSA N288.4-10, <i>Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills</i> [29]	Implemented
CSA N288.5-11, <i>Effluent Monitoring Program at Class I Nuclear Facilities and Uranium Mines and Mills</i> [30]	Implemented
CSA N288.6-12, <i>Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills</i> [31]	Implementation planned for October 2024
CSA N288.7-15, <i>Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills</i> [32]	Implemented
CSA N288.8-17, <i>Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities</i> [33]	Implemented
CNSC REGDOC-2.9.1, <i>Environmental Protection: Environmental Principles, Assessments and Protection Measures, version 1.1</i> (2017) [26]	Implemented

CNSC staff confirm that CNL has implemented programs that are in compliance with the relevant EP regulatory documents and standards and transitioning to implement CSA N288.6-12, *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills* [31]

CNL has acknowledged there are some CSA standards with newer versions available and has committed to providing implementation plans and a gap analysis to ensure its programs align with the more current guidance available. CNSC staff will be tracking and monitoring the implementation of updated CSA standards.

Licensees are also required to regularly report on the results of their EPPs. Reporting requirements are specified in REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills* [34], the [Radiation Protection Regulations](#) [35] (for example, for action levels (ALs) or dose limit exceedances), the licensees' approved programs and manuals, and the licence conditions handbook (LCH) [36].

CNL is required to submit Annual Compliance Monitoring Reports, which includes details and results of their environmental protection measures and monitoring related to the decommissioning of the WL site, as per REGDOC-3.1.2 [34]. These reports are reviewed by CNSC staff for compliance and verification as well as trending. Summaries of CNL's Annual Compliance Monitoring Reports for the WL site are available on the [CNL's website](#) [37].

CNSC staff regularly report on licensee performance to the Commission for activities conducted at the WL site. For example, CNSC staff-produced Regulatory Oversight Reports (RORs) are a standard mechanism for updating the Commission, Indigenous Nations and communities, and the

public on the operation and the regulatory performance of licensed facilities on an annual basis. Previous RORs are available on the [CNSC regulatory oversight reports web page](#) [38]. CNSC staff may also report to the Commission on events, such as unplanned releases to the environment, through an initial event report.

Between 2019 and 2023, there were two reportable events related to the Environmental Protection SCA for WL site:

- March 9, 2021 – Accidental release of low pH water
- June 10, 2021 – Hydraulic fluid spill

CNL reported these events to CNSC, investigated the events, and CNSC staff were satisfied with CNL's response. These events were not expected to pose a risk to the public or the environment.

2.3.1 Environmental protection measures

To meet the CNSC's regulatory requirements under REGDOC-2.9.1-2017 [26], CNL is responsible for implementing and maintaining EP measures that identify, control, and monitor releases of radioactive nuclear and hazardous substances from the WL site as well as the effects of these substances on human health and the environment. EP measures are an important component of the overall requirement of licensees to make adequate provisions to protect the environment and the health of persons.

This subsection and the ones under section 2.3 summarize CNL's EPP for the WL site and the status of each specific EP measure, relative to the requirements or guidance outlined in the latest regulatory document or CSA Group standard, and CNL has committed to providing implementation plans for the CSA standards that have newer available versions. Section 3.0 of this EPR report summarizes the results of these programs or measures against relevant regulatory limits and environmental quality objectives or guidelines, and discusses trends, where applicable.

CNL is required to implement an environmental management system (EMS) that conforms to REGDOC-2.9.1-2017 [26] and to submit an EPP for the WL site. CNL's EPP includes the following components to meet the requirements and guidance as outlined in REGDOC-2.9.1-2017 [26]:

- EMS (subsection 2.3.2)
- ERA (subsection 2.3.3)
- Effluent and emissions control and monitoring (subsection 2.3.4)
 - derived release limits and operating release limits
 - air emissions and liquid effluent monitoring
- Environmental monitoring program (EMP) (subsection 2.3.5)
 - ambient air monitoring
 - soil monitoring
 - surface water monitoring
 - groundwater monitoring
 - gamma monitoring

2.3.2 Environmental management system

An EMS refers to the management of an organization's environmental policies, programs, and procedures in a comprehensive, systematic, planned, and documented manner. It includes the organizational structure as well as the planning and resources to develop, implement, and maintain an EP policy. As per CNLs EP Policy [39], CNL has made a commitment to key principles of EP, including:

- to practice responsible environmental management
- to commit to pollution prevention
- to set environmental objectives and targets to support continual improvement of their environmental performance
- to set sustainability objectives and targets for energy efficiency, clean energy utilization, waste management and conservation of resources to support continual improvement of their performance
- to comply with environmental laws, requirements, and recognized standards and guidelines applicable to their activities
- to review the impacts of their activities, facilities, projects, services and products on the environment
- to seek to develop and improve technologies to advance environmental protection and clean air solutions
- to promote public and employee awareness of their policy and their environmental performance

The EMS serves as a management tool to integrate all licensee's EP measures in a documented, managed, and auditable process, in order to:

- identify and manage non-compliances and corrective actions within the activities, through internal and external inspections and audits
- summarize and report on the performance of these activities both internally (licensee management) and externally (Indigenous Nations and communities, the public, interested stakeholders, and the Commission)
- train personnel involved in these activities
- ensure the availability of resources (that is, qualified personnel, organizational infrastructure, technology, and financial resources)
- define and delegate roles, responsibilities, and authorities essential to effective management

CNL established and implemented an EMS for the WL site in accordance with REGDOC-2.9.1-2017 [26] and is also registered and certified under the International Organization for Standardization (ISO) standard 14001:2015 (a standard that helps an organization achieve the intended outcomes of its EMS). CNSC staff review CNL's annual internal audits, management reviews, and environmental goals, targets, and objectives to ensure compliance with REGDOC-2.9.1-2017. While the CNSC does not consider ISO 14001 certification as part of the criteria for meeting the requirements of REGDOC-2.9.1, the results of these third-party audits are reviewed by CNSC staff as part of the compliance program. CNSC staff also review the status of CNL's

annual goals, targets, and objectives and the implementation of the EMS as part of their review of the annual reports on EP.

The results of these reviews demonstrate that CNL's EMS for the WL site meets CNSC requirements as outlined in REGDOC-2.9.1-2017 [26]. In 2018, the EMS was recertified to ISO 14001-2015. The implementation of the EMS ensures that CNL continues to improve environmental performance at the WL site.

2.3.3 Environmental risk assessment

An ERA of nuclear facilities is a systematic process used by licensees to identify, quantify, and characterize the risk posed by contaminants and physical stressors in the environment on human and other biological receptors, including the magnitude and extent of the potential effects associated with a facility or site. The ERA serves as the basis for the development of site-specific EP control measures and EMPs. ERAs include an ecological risk assessment (EcoRA) and a human health risk assessment (HHRA) for radiological and hazardous contaminants and physical stressors. The results of these programs and assessments, in turn, inform and refine future revisions of the ERA.

Under [REGDOC 2.9.1, *Environmental Principles, Assessment and Protection Measures*](#) and CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* **Error! Reference source not found.**, CNL is required to establish and maintain a site-wide ERA for WL. For this licensing period, WL's CSR [11] was used to inform the WL site EP measures. Note that WL's CSR pre-dates CSA N288.6-12, and as such, is not considered compliant with standard.

The WL site was required to comply with the requirements of CSA N288.6-12 commencing in January 2020. In November 2019, CNSC staff requested CNL to provide a date for when the required site-wide ERA would be submitted for review and acceptance, to which CNL committed to submitting the ERA for September 2022.

CNL informed CNSC staff that submission of the site-wide ERA would be delayed to February 2023 and again to May 2023 due to delays with their contractor. On May 31, 2023, CNL submitted the required WL site-wide ERA to CNSC staff for review and acceptance per CSA N288.6-12. This ERA covers current operational activities for the WL site. CNSC and Environment and Climate Change Canada (ECCC) staff reviewed the site-wide ERA and provided comments for CNL to address in January 2024. The comments are related to further needed clarification, additional information and the removal of incorrect assessments in the site-wide ERA.

CNL is working to address the technical comments and recommendations and will resubmit a revised site-wide ERA for CNSC staff acceptance prior to the WL site licence renewal hearing in October 2024.

Although acceptance of the site-wide ERA remains outstanding, CNSC staff's review to date of the submitted site-wide ERA, annual compliance reports, CNSC Independent Environmental Monitoring Program results and other environmental monitoring programs, indicate that there is low risk to the environment. CNSC staff determined that there are adequate measures to protect members of the public and/or Indigenous Nations and communities from legacy contamination and operational activities on the WL site.

Upon CNSC staff's acceptance of CNL's site-wide ERA, this EPR report will be revised to include an assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities at the WL site.

2.3.4 Effluent and emissions control and monitoring

Controls on environmental releases are established to provide protection to the environment and to respect the principles of sustainable development and pollution prevention. The effluent and emissions prevention and control measures are established based on industry best practice, the application of optimization of protection (such as in design), the as low as reasonably achievable (ALARA) principle, applicable standards and guidelines, and the prevention and control measures in place are based on the results in the licensee's ERAs.

The EPP [40] was submitted in 2021 and reviewed and accepted by CNSC staff in 2021. This program contains licenced release limits (including site-specific derived release limits (DRLs)) and action levels (ALs) to control releases of radiological nuclear and hazardous substances to the environment. The DRLs represent the maximum acceptable level of emitted contaminants from the processes at the WL site and are derived from the dose limit for members of the public (that is, 1 millisievert (mSv) per year). CNL also has established internal control measures or ALs that serve as an early warning of potential loss of control to prevent licence release limit exceedances. The most recent DRLs for the WL site were submitted in 2020 and were reviewed and accepted by CNSC staff in 2020. the most recent ALs for air emissions and liquid effluents were submitted in 2022 and CNSC staff reviewed and accepted the revised document in 2022.

CNL's effluent verification monitoring program for the WL site has been reviewed and accepted by CNSC staff and is in compliance with REGDOC-2.9.1-2017 [26] and the relevant standards, including CSA N288.5-11, *Effluent Monitoring Program at Class I Nuclear Facilities and Uranium Mines and Mills* [30]. CNL has committed to providing implementation plans for CSA standards that have newer versions and CNL will revise its EPP accordingly during the upcoming licence period to address any changes in their programs associated with REGDOC 2.9.1-2017.

Based on compliance activities, CNSC staff have found that the effluent and/or emissions monitoring program currently in place for the WL site continues to protect human health and the environment.

2.3.5 Environmental monitoring program

The CNSC requires each licensee to design and implement an EMP that is specific to the monitoring and assessment requirements of the licensed facility and its surrounding environment. The program is required to:

- measure contaminants in the environmental media surrounding the facility or site
- determine the effects, if any, of the facility or site operations on people and the environment
- serve as a secondary support to effluent and emission monitoring programs to demonstrate the effectiveness of emission controls

More specifically, the program must gather the necessary environmental data to calculate public dose and demonstrate compliance with the radiological public dose limit found in the [Radiation Protection Regulations](#) [35] of 1 mSv per year. The program design must also address the potential environmental interactions identified at the facility or site. Monitoring radionuclides is the major focus at the WL site although non-radiological hazardous substances are monitored in liquid effluent from the site, groundwater, surface water in ditches and surface water and sediment in dugouts around the site, and air emissions. CNL's EMP for the WL site consists of the following components:

- ambient air monitoring
- air emission monitoring
- wet/dry deposition monitoring
- soil monitoring
- surface water monitoring
- groundwater monitoring
- site intake water monitoring
- liquid effluent monitoring
- gamma radiation monitoring
- sediment monitoring
- vegetation and garden crop monitoring
- wildlife monitoring (radionuclides in flesh and bone)
- fish monitoring (radionuclides in flesh)
- noise monitoring

Monitoring frequency for the WL site is specified in the EMP. CNL's EMP for the WL site includes monitoring a range of components and the monitoring frequency set for each component varies with the level of risk to the environment and to people. For example, CNL continuously monitors their air emissions and liquid effluent whereas they monitor soil annually.

CNL is required to maintain its EMP to comply with REGDOC-2.9.1-2017 [26] and relevant standards, including CSA N288.4-10, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [29]. Based on compliance activities and technical assessments, CNSC staff have found that CNL is compliant with REGDOC-2.9.1-2017 [26] and continues to implement and maintain an effective EMP for the WL site that adequately protects the environment and the health and safety of persons.

To improve the WL site's EMP over the next licence period, it is recommended that CNL implement the following standards/regulatory requirements:

- REGDOC-2.9.2 (2024), *Controlling Releases to the Environment*, version 1.0 [41]
- CSA N288.0-22 (2022), *Environmental management of nuclear facilities: Common requirements of the CSA N288 series of Standards* [42]
- CSA N288.1-20 (2020), *Guidelines for Calculating Derived Release Limits for Radioactive Material in Airborne and Liquid Effluents for Normal Operation of Nuclear Facilities* [43]
- CSA N288.4-19 (2019), *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [44]

- CSA N288.5-22 (2022), *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [45]
- CSA N288.7-23 (2023), *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [46]

2.3.6 Cumulative effects

A formal cumulative effects assessment is not a requirement within CNSC staff's assessments for EPRs as it is not a requirement under the NSCA and other regulatory documents. However, CNSC staff's assessments do consider the accumulation of contaminants of potential concern (COPC) within the environment because of the facility or activity through monitoring data in annual reports, data from the IEMP, and results from any regional monitoring programs and health studies.

Licensees are required to meet on-site and near-field monitoring requirements associated with their provincial approvals and the federal regulations, including full life-cycle requirements. These programs focus on single operations with scheduled reports on performance submitted to the regulators. These activities are further supplemented by the CNSC's IEMP activities (see section 4.0), which focuses on local areas where Indigenous Nations and communities and members of the public could reasonably be expected to conduct recreational or traditional activities (that is, off-site accessible areas).

2.4 Reporting of environmental releases under other federal or provincial legislation

A core element of the CNSC's requirement for an EMS is the identification of all regulatory requirements applicable to the facility or site, whether pursuant to the NSCA or other federal or provincial legislation. The EMS must ensure that programs are in place to respect these requirements.

2.4.1 Greenhouse gas emissions

While there are a range of broadly applicable federal environmental regulations (for example, petroleum products storage tanks, environmental emergency regulations), the management of greenhouse gas (GHG) emissions has been identified as a national priority.

Under the federal [Canadian Environmental Protection Act, 1999 \(CEPA 1999\)](#) [47], CNL is required to monitor and report on GHG emissions. Nuclear facilities that emit more than the emission reporting threshold (that is, 10,000 tons of CO₂ equivalent) on an annual basis must report their GHG emissions to ECCC.

CNL's WL site has consistently been well below ECCC's GHG emission threshold and continues to monitor GHG emissions at the WL site. CNL reports the emissions in their Annual Compliance Monitoring Report. GHG emissions for Canadian facilities can be accessed on the Government of Canada's website: [Greenhouse Gas Reporting Program data search - Canada.ca](#) [48].

The CNSC maintains a collaborative working relationship with ECCC through a formal [memorandum of understanding](#) (MOU) [49], which includes a notification protocol. An exceedance of the GHG emissions threshold would be included under this notification protocol. This ensures that a coordinated regulatory approach is achieved to meet all federal requirements associated with EP, including GHGs.

2.4.2 Halocarbons

In accordance with the [Federal Halocarbon Regulations, 2022](#) [50], CNL is required to provide a semi-annual halocarbon release report to ECCC on the release of halocarbons of an amount greater than 10 kg but less than 100 kg from any system, container, or equipment at the WL site. In the event of a release that surpasses 100 kg, CNL would be required to report the releases to ECCC within 24 hours and ECCC would inform the CNSC through the notification protocol of the MOU. CNL would then be required to submit a follow-up report within 30 days of the release detailing the circumstances leading to the release and the corrective and preventative actions taken to prevent a reoccurrence.

Since 2016, CNL has reported two halocarbon releases at the WL site: an exceedance of 100 kg in 2017 and a release above 10 kg but below ECCC's halocarbon emission threshold of 100 kg. CNL continues to monitor halocarbon releases at the WL site and reports the releases in their Annual Compliance Monitoring Report. Halocarbon releases for Canadian facilities can be accessed on the Government of Canada's website: [National Pollutant Release Inventory data search](#) [51].

2.4.3 Sulphur dioxide emissions

Under the authority of CEPA 1999 [47], CNL is also required to estimate the total sulphur dioxide (SO₂) emissions from the WL site and report to the National Pollutant Release Inventory (NPRI) [51], provided that the reporting requirements are met.

Between 2016 and 2022, the SO₂ emissions from the WL site were consistently below the NPRI's 20 tonne reporting threshold, therefore this data was not reported to the NPRI. CNL continues to monitor SO₂ emissions at the WL site and reports the emissions in their Annual Compliance Monitoring Report. SO₂ emissions for Canadian facilities can be accessed on the Government of Canada's website: [National Pollutant Release Inventory data search - Canada.ca](https://www23.international.gc.ca/npri/index.aspx?lang=eng) [51].

2.5 Canadian Nuclear Safety Commission and federal partners consideration of climate change

The CNSC's regulatory framework requires licensees and proponents to consider climate change primarily through requirements related to EAs and safety assessments. These assessments take place throughout the licensing lifecycle as part of the licence application, licence renewal and periodic safety analysis update process.

CNSC staff's consideration of climate change during these assessments may include examining whether climate change is considered in the analysis of external hazards and environmental parameters such as meteorological and hydrological parameters used in the design, evaluation, and upgrade of a nuclear facility, and whether a licensee has applied the defence-in-depth principle in its design with sufficient safety margin.

Specifically, climate change considerations are included in the following mechanisms in the regulatory framework.

2.5.1 Environmental assessment

Previously under CEAA 2012 and currently under the IAA, proponents must assess the climate change impact on a project itself and thereby the surrounding environment, over the lifetime of the facility or site. As discussed in section 2.6, the WL site has undergone EA under CEAA 1992 for WL Decommissioning Project as per the 2001 CSR [11] CNL has demonstrated that, with mitigation measures implemented, climate change sensitive naturally occurring events that can produce extreme conditions affecting the performance of decommissioning activities, such as extreme rainfall and flooding, tornadoes, and forest/grass fires, would not likely have an impact on the site and authorized decommissioning work that would lead to residual adverse effect.

2.5.2 Safety Analysis Updates

Licensees for nuclear facilities such as the WL site are required to perform regular safety analysis and produce updated safety analysis report (SAR). The safety analysis systematically evaluates the potential hazards and considers the effectiveness of preventive measures and strategies in reducing the effects of such hazards. Hazard Identification and Assessment are one of the safety factors evaluated in the safety analysis, and includes analysis of external hazards, such as flooding, and their impact on a facility. CNSC staff review the SAR and ensure that up-to-date hazard information is included.

In CNL's latest safety analysis reports [52] [53] [54], flood hazards including a beyond design basis accident such as catastrophic failure of the Seven Sisters Dam would have negligible impact at WL site, indicating that risk due to external flood hazards is low. Reports [48] and [49] were completed in 2015 whereas [50] in 2000. CNSC has a path forward with CNL to revise them in the future. CNL's analysis regarding the assessment of the beyond design basis accident, in this case, flooding from dam failure, is taken from the 2001 CSR [11] which was reviewed and approved by CNSC. Nonetheless, it is not clear when the dam breach assessment was completed or whether it is updated since. The dam is operated by Manitoba Hydro and CNL has MOU with them to ensure shoreline protection and control water level at WL between 830 and 845 feet above mean sea level.

2.5.3 Environmental risk assessment

As described further in section 2.3.3, an ERA (updated in a 5-year review cycle) evaluates risk posed by contaminants and physical stressors to the environment under normal operating conditions, taking into consideration recent monitoring data (including meteorological parameters) and new scientific knowledge. When reviewing subsequent submissions of CNL's site-wide ERA, CNSC staff will continue to assess potential impacts of WL site to human and ecological receptors keeping in mind any environmental changes due to climate change.

2.5.4 CNSC and ECCC collaboration

CNSC and ECCC have an MOU [49] in place that includes collaboration related to climate change. For example, ECCC contributes expertise on climate change projections and estimates of extreme rainfall intensity, duration, frequency and probable maximum precipitation for various sites to CNSC staff. This informs CNSC staff's technical reviews.

ECCC also has the mandate to monitor and provide meteorological data to Canadians, to conduct scientific research regarding the mechanism and effects of climate change, and to develop science-based guidance on assessment of climate change for application when projects are subject to federal impact assessments. The [Strategic Assessment of Climate Change Guidance](#) [55] includes specific guidance on net zero plans, calculation of GHG emissions/intensity and resiliency.

2.5.5 Relevant Potential Changes in Climate

CNSC staff consider the latest scientific information related to climate change to inform our regulatory oversight and technical reviews.

Scientific information that is considered includes the following reports:

- Canada's [Changing Climate Report](#) [56] and its [supplement](#) [57], predicts that increases in global mean temperature could result in numerous impacts in Canada.
 - It is virtually certain that Canada's climate has warmed and that it will warm further in the future.
 - Extreme hot temperatures will become more frequent and more intense. This will increase the severity of heatwaves and contribute to increased drought and wildfire risks.
 - Annual and winter precipitation is projected to increase everywhere in Canada over the 21st century, with larger percentage changes in northern Canada. Summer precipitation is projected to decrease over southern Canada under a high emission

- scenario toward the end of the 21st century, but only small changes are projected under a low emission scenario.
- For Canada as a whole, daily extreme precipitation is projected to increase with high confidence with a shift toward less snowfall and more rainfall.
 - Extreme precipitation amounts accumulated over a day or shorter are projected to increase; thus, there is potential for a higher incidence of rain-generated local flooding, including in urban areas.
 - The duration of seasonal lake ice cover will decline across Canada due to later ice formation in fall and earlier spring breakup (medium confidence).
- Canada's Changing Climate Report [56] also provides changes in Canada's Regions and below is a summary for Prairies Provinces including Manitoba:
 - The annual mean temperature has increased by 1.9°C over the period 1948–2016, at a rate above that for Canada as a whole.
 - It is projected to increase by 2.3°C and 6.5°C for 2031–2050 and 2081–2100 respectively compared with a baseline of 1986–2005 for a high emission scenario (RCP8.5).
 - The annual precipitation increased by 7.0% during 1948–2012 with seasonal trends ranging from a decrease of 5.9% in winter to an increase of 13.6% in spring, although there is low confidence in the magnitude of these trends.
 - It is projected to increase by 6.5% and 15.3% for 2031–2050 and 2081–2100 respectively compared with a baseline of 1986–2005 for a high emission scenario (RCP8.5).

2.5.6 Whiteshell Laboratories Site Sensitivities to Changes in Climate

The 2001 CSR [11] identified and evaluated climate change sensitive hydrological and meteorological hazards affecting the performance of the decommissioning activities and the nuclear facilities at the WL site that include mainly extreme rainfall and flooding and forest/grass fires. The CSR concluded that with implementation of mitigation measures, climate change sensitive hazards would not likely have impact on the project that would lead to residual adverse effect. As per the 2021 DDP [4], CNL is currently reviewing their plans to complete the decommissioning of all facilities at WL site by 2026/2027 fiscal year. The closure phase or decommissioning phase of WR-1 is also projected by CNL to be completed in a shorter time frame [58]; this project is currently undergoing an EA. For the purposes of assessing the impact of climate change, the time frame is typically considered to be 30-year period as this is the length of time needed for climate trends to develop. The rate of change of climate parameters (e.g., precipitation) due to climate change may not be linear; thus, climate change is often assessed at long-term horizons.

The climate change parameters that have a potential interaction with the current WL decommissioning activities and site facilities include precipitation, temperature and frequency and severity of extreme weather events. Based on the [Climate Atlas of Canada](#) [59], the annual precipitation and mean temperature at WL site are projected to increase by 7% and 5°C respectively by the end of 2080 under high emission scenario (RCP8.5). The frequency and severity of extreme weather events (e.g., extreme rainfall events) are also likely to increase as the climate changes.

Since the decommissioning phase of WL site including WR-1 has a shorter time frame from a climate change perspective, it has a smaller potential for meaningful interactions with the climate trends outside of the normal seasonal variation experienced in the region.

Evaluation of Climate Related Impacts

The interaction between the climate sensitive hazards and WL site facilities, including the WMA, CCSF, SF and WR-1, and the performance of the decommissioning activities have been further evaluated as per 2001 CSR [11] and a summary of these analysis, as well as the review by CNSC staff, are described below.

2.5.7 Extreme Rainfall and Flooding

The potential increase in the frequency and/or severity of extreme precipitation events due to climate change may include overflow of storm drainage facilities and some localized soil erosion at WL site. However, the impact of climate change is negligible due to a shorter time frame for decommissioning activities to have any meaningful interaction with projected future changes in the climate. Regardless, CNL will maintain adequate storm drainage facilities as indicated in the 2001 CSR [11]. In addition, the 2001 CSR concluded that WR-1 and the concrete canisters, in particular, have been designed to withstand extreme environmental events; new storage facilities constructed during decommissioning will also be designed to withstand extreme environmental events.

2.5.8 Flood Hazard

Flooding of the Winnipeg River may result from extreme rainfall conditions, that are projected to exacerbate due to climate change, and/or as a result of failure of the Seven Sisters Dam which is located southeast of the WL site. The WL site is located at least 12-15 m above normal Winnipeg River levels and is well above any recorded flood levels [60]. Serious flooding from this source is considered to be beyond extremely rare due to the fact that there are no large tributary streams near the site [60].

In the very unlikely event of a catastrophic failure of the Seven Sisters Dam, the peak flood level would be 7 m above normal conditions on AECL property but will not flood the site [11]. In addition, Manitoba Hydro has contingency plans for comprehensive notification, warning, and response systems in case an emergency condition is detected. An overflow of the river is deemed highly unlikely and considered a beyond design basis accident (BDBA), that is extremely low probability of occurrence less than 1 in 1,000,000 years, thus the effects on the decommissioning activities would be negligible [11]. This demonstrates that the potential flood impact at WL site is not significant regardless of climate change and any potential increase in precipitation or extreme rainfall trends due to climate change is also negligible as the decommissioning phase has a shorter time frame to have any meaningful interaction with projected future changes in the climate.

2.5.9 Forest and Grass Fires

Natural grasslands and hardwood forests are located close to WL site [11]. Forest or/and grass fires may result from extremely dry conditions and such conditions are projected to increase in frequency and severity at WL site due to climate change [61]. However, since the decommissioning phase has a shorter time frame, climate change has a smaller potential impact

for meaningful interactions with the climate trends outside of the normal seasonal variation experienced in the region. Regardless, the risk of a fire as a result of grass or brush fires is low, since all undergrowth and grass is trimmed regularly to limit the fuel required to sustain a grass fire within the fenced area [11] [60]. WL has also procedures for dealing with fires. Fire fighting capability will also be supplemented with arrangements with surrounding communities [11].

2.5.9.1 Findings

The key climate change sensitive hazards that may have an interaction with the WL site facilities and the performance of decommissioning activities include extreme rainfall, flooding, and extreme dry conditions.

CNSC staff have reviewed the impact of climate change sensitive hazards at WL site as reported in the comprehensive study report [11] and also the relevant climate change parameters in the latest projections [56]. CNSC staff also assessed the impact of the anticipated changes in climate sensitive hazards at WL site within the projected time scale of completion of WL site decommissioning. In addition, CNSC staff reviewed information relevant to climate change resiliency through the cyclical submissions of hazard analysis information related to safety analysis.

CNSC staff concludes that, despite possible changes to the climate in the future, the effect of climate change parameters on WL site facilities (WMA, CCSF, SF and WR-1), the performance of decommissioning activities and the associated risk to either the public or the environment, is expected to be negligible, especially considering a smaller potential for meaningful interactions of the decommissioning phase with the climate trends outside of the normal seasonal variation experienced in the region due to shorter time frame for the completion of the decommissioning activities.

3.0 Status of the environment

This section provides a summary of the status of the environment around the WL site. It starts with a description of the radiological and hazardous releases to the environment (section 3.1). Typically, this section is followed by a description of the environment surrounding the licensed nuclear site and an assessment of any potential effects on the different components of the environment as a result of exposure to contaminants as detailed in a licensee's ERA and assessed by CNSC staff. As described in section 2.3.3., CNL's ERA for the WL site is under review. When CNSC staff accept CNL's site-wide ERA this EPR report will be revised to include assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities at the WL site.

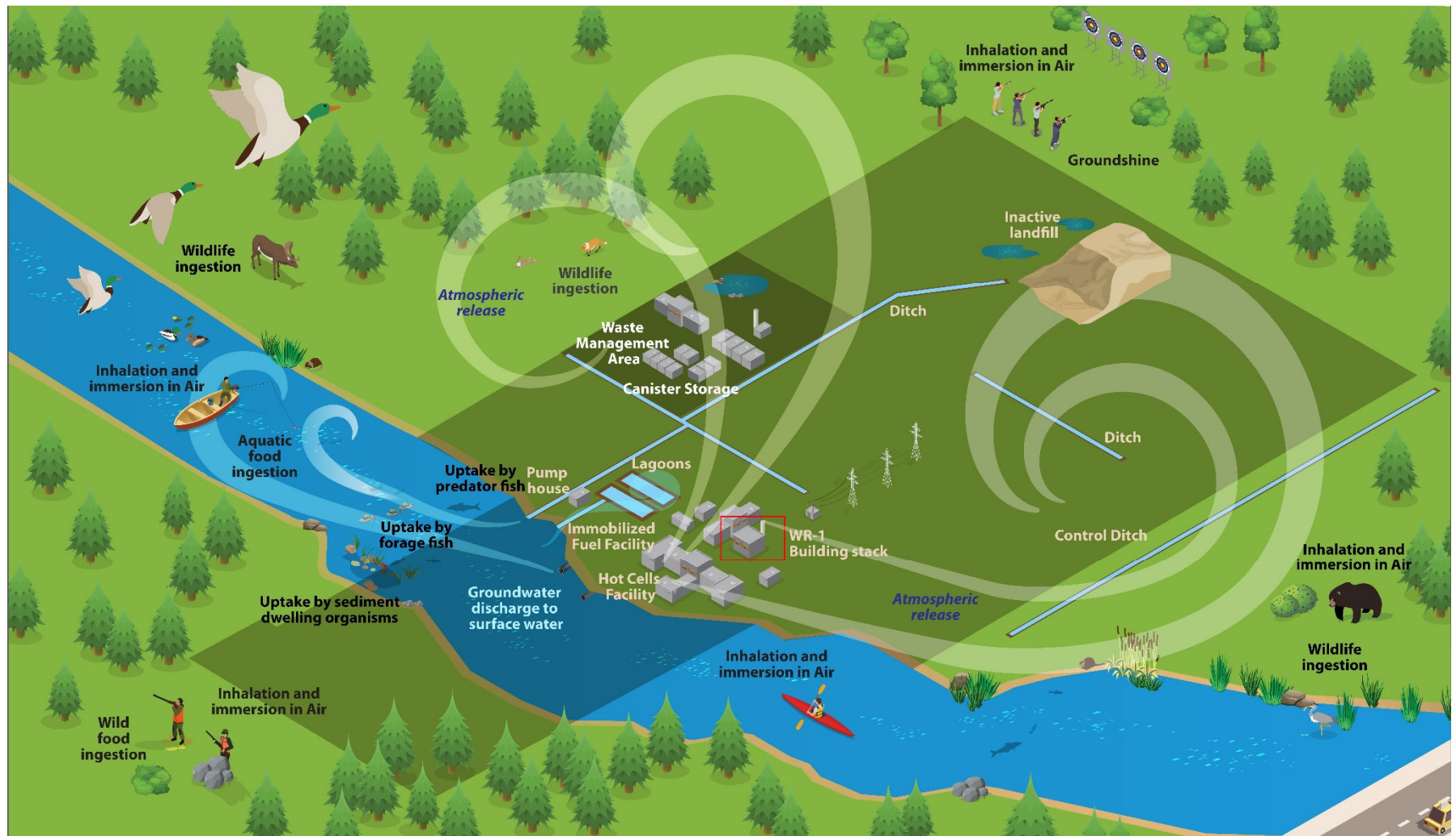
In addition to reviewing ERAs, CNSC staff regularly review the potential effects to environmental components through annual reporting requirements and compliance verification activities, as detailed in other areas of this report. This information is reported to the Commission in the sections on EP in licensing CMDs and annual RORs. Summaries of CNL's annual Environmental Monitoring Report and Annual Compliance Monitoring Reports for the WL site are publicly available and can be viewed [here](#) [37].

3.1 Releases to the environment

Radioactive and hazardous substances that have the potential to cause an adverse effect to ecological or human receptors are identified as COPCs. The ways in which COPCs could find their way to the different receptors considered by an ERA are called 'exposure pathways'.

Figure 3.1 illustrates a conceptual model of the environment around the WL site to show the relationship between releases (airborne emissions or waterborne effluent) and human and ecological receptors. This graphic is meant to provide an overall conceptual model of the releases, exposure pathways, and receptors and thus, should not be interpreted as a complete depiction of the WL site and its surrounding environment. The specific releases and COPCs associated with the WL site are explained in detail in the following subsections.

Figure 3.1. Conceptual model of the environment around the WL site



3.1.1 Licensed release limits

The WL site has established site-specific DRLs and ALs to control releases of radiological effluents and emissions to the environment, which are based on the most-exposed person receiving a radiological dose of 1 mSv per year from radiological releases at the WL site during normal operations. The ALs in place are set much lower than DRLs to serve as an early warning of potential loss of control.

The most recent DRLs were submitted for the WL site in 2020 and were developed in accordance with CSA N288.1-14 [27]. The updated DRL document included values for additional radionuclides that have the potential to be released from their waste management area. The most recent ALs for air and liquid radioactive effluents were provided in 2022 and were derived in accordance with CSA N288.8-17. CNSC staff reviewed and accepted CNL's DRL and AL submissions and conclude that the limits in place are protective of the environment and people.

3.1.2 Airborne emissions

CNL controls and continuously monitors airborne emissions from the WL site to the environment under its EPP's Effluent Verification Monitoring Plan (EVMP). This program is based on CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mill* [30] and includes monitoring of both radiological and hazardous emissions.

3.1.2.1 Radiological emissions

The main radiological emission sources are from the stack of the WR-1 reactor Building (B100) and the roof vent of Building 300 (B300) where the Hot Cells Facility and Immobilized Fuel Facility are located. For each of these locations, gross alpha and gross beta emissions are continually monitored. Additionally, tritium releases from purging the airflow of the WR-1 reactor's moderator system are routinely collected and analyzed.

Table 3.1 provides annual radionuclide releases from the WL site to the atmosphere for the 2016-2022 reporting period. The radiological emissions remain a small fraction of their DRLs.

Table 3.1: Annual airborne radiological emissions from the WL site compared to their derived release limits (2016 – 2022) [5] [6]

Emission	Tritium (becquerels/year (Bq/yr))	Gross beta particulates (Strontium-90) (Bq/yr)	Gross alpha particulates (Pu-239) (Bq/yr)
DRL (2016-2018)	8.58E+16	3.60E+11	9.00E+10
2016	3.24E+10	2.12E+05	9.46E+04
2017	5.04E+10	2.24E+05	9.36E+04
2018	1.31E+10	1.70E+05	9.36E+04
2019	3.34E+10	3.27E+05	9.30E+04
DRL (2020-2022)	8.58E+16	3.53E+11	9.00E+10
2020	1.31E+10	2.13E+5	1.00E+5

Emission	Tritium (becquerels/year (Bq/yr))	Gross beta particulates (Strontium-90) (Bq/yr)	Gross alpha particulates (Pu-239) (Bq/yr)
2021	2.70E+10	2.33E+5	8.39E+4
2022	2.79E+10	1.23E+5	7.58E+4

3.1.2.2 Non-radiological hazardous emissions

The main sources of non-radiological emissions at the WL site are from the use of Number 2 fuel oil for heating, diesel fuel for generators, and dust generation from sandblasting, decommissioning activities (building demolition), excavation projects, and vehicle traffic on site. In 2013, CNL replaced the Number 2 fuel oil with propane for heating. Since small quantities of carbon monoxide, nitrogen oxides, sulphur dioxide, hydrocarbons, and particulate matter are released from these sources, CNL monitors these emissions and reports the data to the NPRI if the reporting thresholds are exceeded [51]. Table 3.2 provides the total annual airborne non-radiological hazardous emissions from the WL site between 2016-2022 along with the associated NPRI reporting thresholds. Many emission values were below the NPRI reporting thresholds and the annual values for particulate matter that exceeded the NPRI thresholds are attributed to increased dust due to building demolition and excavation projects.

Table 3.2: Total annual airborne non-radiological hazardous emissions from the WL site compared to NPRI reporting thresholds (2016 to 2022) [5] [6]

Emission (Milligram/year (Mg/yr))	2016	2017	2018	2019	2020	2021	2022	NPRI reporting threshold (Mg/year)
Nitrogen oxides (NO _x as NO ₂)	0.91	0.75	0.54	0.62	0.60	0.33	0.49	20
Sulphur dioxide (SO ₂)	0.02	0.02	0.01	0.02	0.02	0.01	0.01	20
Carbon monoxide (CO)	0.40	0.35	0.23	0.27	0.26	0.16	0.20	20
Total particulate matter (PM ₁₀ & 2.5)*	15.02	13.65	14.56	10.57	8.88	8.17	46.9	20
PM ₁₀ *	3.85	3.50	3.73	2.71	2.28	2.09	11.97	0.5
PM _{2.5} *	0.41	0.38	0.39	0.29	0.25	0.22	1.21	0.3
Volatile organic compounds	0.07	0.06	0.04	0.05	0.05	0.03	0.04	10

* Some values of PM10 and PM2.5 were above the NPRI threshold and were reported to the NPRI.

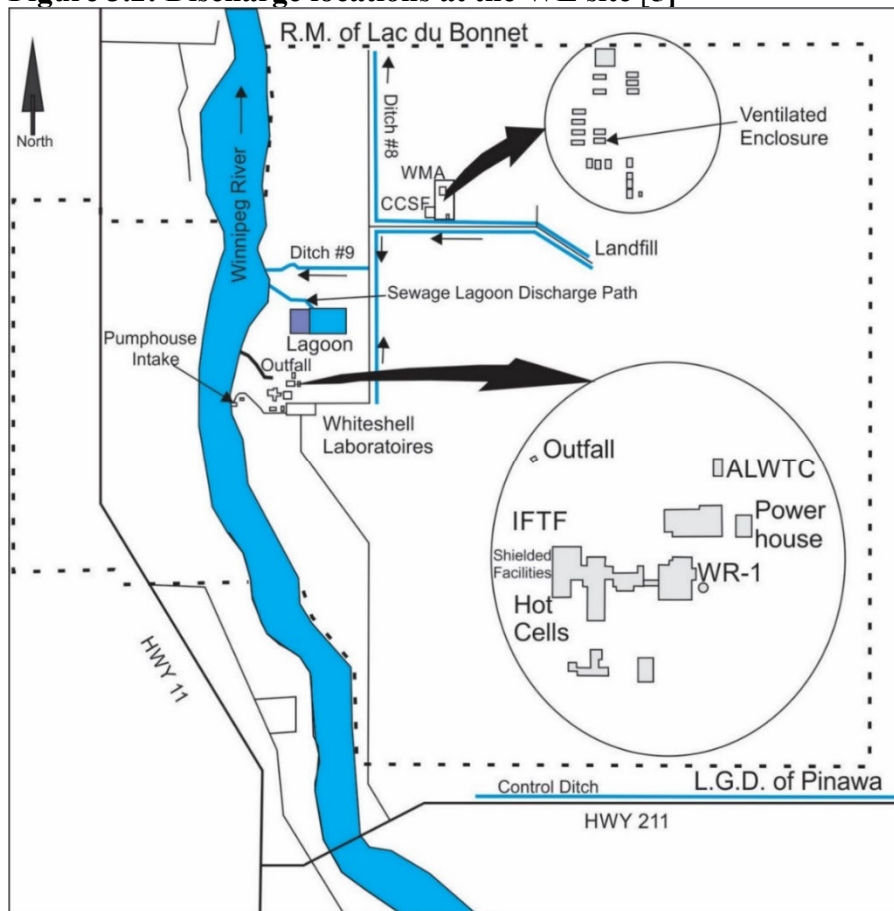
3.1.2.3 Findings

Based on their review of the results of the EPP for the WL site, CNSC staff have found that CNL's air emissions to the environment remained below the approved DRLs for air emissions during the current licensing period. CNL continues to monitor and report on non-radiological hazardous substances, GHGs, halocarbons, and sulphur dioxide emissions released to the atmosphere and the monitoring results show that CNL continues to protect the people and the environment from atmospheric releases.

3.1.3 Waterborne effluent

CNL controls and monitors liquid (waterborne) effluent from the WL site to the environment under its implementation of their EPP. This program is based on CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [30] and includes monitoring of radiological and hazardous releases.

As part of CNL's EVMP, releases of radiological and hazardous contaminants to surface water are monitored. The WL site main sources of effluent releases to the Winnipeg River are from the Process Outfall and the Lagoon before dilution occurs at the end of pipe. The Outfall effluent includes stormwater runoff from paved roadways around buildings, cooling water used in process and experimental facilities, and holding tank discharges. In addition to licence release limits, CNL has established liquid effluent ALs and internal control levels for the WL site, which are used to prevent AL exceedances. Exceedances of regulatory limits and ALs are reported to the CNSC, documented, investigated and appropriate corrective action are taken. The discharge locations are shown below in Figure 3.2.

Figure 3.2: Discharge locations at the WL site [5]

3.1.3.1 Radiological liquid effluent

Liquid effluent releases from the WL site are monitored for gross alpha, gross beta, total uranium, plutonium-239/240, plutonium-238, americium-241, strontium-90, cesium-137, and tritium. The main source of radionuclides in liquid effluent is from the outfall, which includes storm water runoff from paved roadways, water from around buildings that enters the weeping tile system, process and facility cooling water, and liquid discharges from waste treatment systems. The secondary source of radionuclides in liquid effluent is from the sewage lagoon, which receives sanitary and wastewater from most of the buildings onsite and also includes water from the laundry facility. Table 3.3 provides the total annual releases of gross alpha, strontium-90, cesium-137, and tritium in liquid effluent from the WL site between 2016-2022 and compared to their accepted DRLs. These radionuclides are selected as they are the primary contributors to dose from surface water. The values show that the releases of radionuclides in liquid effluent remain a small fraction of their DRLs.

Table 3.3: Total annual liquid effluent releases of gross alpha, strontium-90, cesium-137, and tritium from the WL site (2016 – 2022) [62] [63]

	Gross Alpha (Bq/yr)	Strontium-90 (Bq/yr)	Cesium-137 (Bq/yr)	Tritium ³ (Bq/yr)
DRL (2016-2019)	1.33E+10 ¹	1.56E+11	1.39E+11	8.16E+14
2016	3.78E+07	4.39E+07	1.63E+07	N/A
2017	3.88E+07	6.67E+07	1.89E+07	N/A
2018	3.90E+07	3.21E+07	1.51E+07	N/A
2019	5.82E+07	5.95E+07	2.11E+07	4.51E+09
DRL (2020-2022)	6.03E+10 ²	1.56E+11	1.39E+11	8.16E+14
2020	6.67E+07	5.71E+07	1.86E+07	4.91E+09
2021	2.80E+07	1.94E+07	1.04E+07	4.18E+09
2022	2.69E+07	1.03E+07	8.36E+06	5.96E+09

¹ DRL for gross alpha is the DRL for Am-241 since it was identified as the radionuclide with the most restrictive DRL in revision 5 of WL's DRL document [63].

² DRL for gross alpha is the DRL for Pu-238 since it was identified as the radionuclide with the most restrictive DRL in revision 6 of WL's DRL document [62].

³ Starting in 2019, samples of liquid effluent from the Outfall were also analyzed for tritium since tritium was known to exist in the WR-1 reactor. Tritium analysis was initiated as a check since decommissioning activities at the WL site have the potential for releasing tritium. Prior to 2019, tritium analysis of liquid effluent was not available, as indicated with "N/A" [64].

3.1.3.2 Non-radiological hazardous liquid effluent

Liquid effluent releases from the WL site are monitored for non-radiological hazardous substances and the main sources of hazardous substances at the WL site are from the Process Outfall and the Lagoon. Since 2009, the Process Outfall and Lagoon discharges to the Winnipeg River from the WL site have been decreasing due to decreases in site activities and decommissioning work. CNSC staff conduct routine compliance verification of these releases by comparing the effluent monitoring data against CNL's non-radiological hazardous effluent limits. Tables 3.4 and 3.5 provide annual monthly average concentrations of hazardous contaminants released from the Process Outfall and the Lagoon to the Winnipeg River between 2016-2022 and show that hazardous effluent releases from the Process Outfall and Lagoon remain well below the effluent limits.

Table 3.4: Annual monthly average releases of hazardous substances from the WL site Process Outfall compared to applicable release limits (2016 – 2022) [5] [6]

Parameter	Unit	Effluent limit ^{1,2}	2016	2017	2018	2019	2020	2021	2022
pH		6-9	7.50	7.81	7.76	7.67	7.50	7.66	7.62
Phosphorus	µg/L	1000	40	35	30	22	21	22	41
TSS	mg/L	25	2.4	2.97	1.5	4.2	5.4	5.3	14.3
Chromium	µg/L	500	0.1	0	0.1	0.6	0.5	0.3	0.6
Copper	µg/L	500	6	6	5	5	10	7	5
Iron	mg/L	1	0.32	0.26	0.19	0.22	0.30	0.27	0.77
Lead	µg/L	100	0.4	0.3	0.2	0.2	0.4	0.3	0.5
Nickel	µg/L	500	0.9	2	0.6	0.5	0.7	1.7	1.3
Zinc	µg/L	500	3	1	1	4	6	6	0.9
Mercury	µg/L	1 ³	0.001	0	0.0006	0.0009	0.0002	0.0003	0.0039
Phenolics	µg/L	20	1.7	4	0.1	0.3	0	0	0.1
Oil & grease	mg/L	15	0.8	0.2	0.1	0.02	0	0.15	0.09
Total yearly discharge of effluent	m ³	-	1,410,000	1,130,000	1,160,000	1,250,000	1,210,000	1,230,000	1,450,000

¹ CNL, Procedure - WL Non-Radioactive Effluent Limits, WL-509244-PRO-002 Revision 0, 2015.

² Effluent limits apply to the monthly average release concentrations.

³ Daily Internal Control Level.

Table 3.5: Annual monthly average releases of hazardous substances from the WL site Lagoon compared to applicable release limits (2016 – 2022) [5] [6]

Parameter	Unit	Effluent limit ^{1,2}	2016	2017	2018	2019	2020	2021 ⁴	2022
COBD	mg/L	25	0	2.5	17.7	0	0	N/A	8.2
Un-ionized ammonia	µg/L as N	1250	9.9	10	9.7	1.1	1.0	N/A	0.2
Total residual chlorine	µg/L	20	35	17	18	22	57	N/A	34
Fecal coliform	MPNU/100mL	400	5	40	5	13.5	88	N/A	133
pH		6-9	7.01	8.59	8.68	6.6	7.00	N/A	7.76
Phosphorus	µg/L	1000	83	69	131	49	75	N/A	78
TSS	mg/L	25	1.92	4.81	3.8	1.2	3.9	N/A	5.2
Chromium	µg/L	500	0	0	0	0	0	N/A	0
Copper	µg/L	500	1.6	2.1	1.5	0.7	0	N/A	1.7
Iron	mg/L	1	0.245	0.283	0.370	0.119	0.116	N/A	0.163
Lead	µg/L	100	0	0.1	0	0	0	N/A	0
Nickel	µg/L	500	0.5	1.5	1.5	1.1	0	N/A	0.9
Zinc	µg/L	500	0.5	0	0	0	0	N/A	0.4
Mercury	µg/L	1 ³	0.0006	0	0	0	0	N/A	0
Phenolics	µg/L	20	1.5	1.7	3.3	0	0	N/A	0
Oil & grease	mg/L	15	0.45	0.78	0.856	0	0	N/A	0.28
Total yearly discharge of effluent	m ³	-	74,600	47,200	12,200	38,300	30,800	N/A	41,500

¹ CNL, Procedure - WL Non-Radioactive Effluent Limits, WL-509244-PRO-002 Revision 0, 2015.

² Effluent limits apply to the monthly average release concentrations, with the exception of COBD, TSS, total residual chlorine, and un-ionized ammonia, which apply to annual average release concentrations as per Section 6(2) of the FWTSRs.

³ Daily Internal Control Level.

⁴ There were no lagoon discharges in 2021 and all parameters are marked with N/A to show this data is not available.

3.1.3.3 Findings

CNSC staff have found that CNL's reported liquid effluent discharged to the Winnipeg River from the WL site remained below the CNSC's approved licence limits throughout the reporting period 2016 to 2022. Although the total residual chlorine values were often above CNL's effluent limit in Table 3.5, CNSC staff have no concerns because the Winnipeg River's flow rate is approximately a million times higher than what the Lagoon discharges annually, which will effectively dilute the chlorine discharged [65] and would not pose a concern to the health of the Winnipeg River ecosystem. CNSC staff are satisfied that CNL is taking the appropriate measures at the WL site, as mentioned above, to effectively control and reduce concentrations and loadings of both radiological and non-radiological hazardous substances in waterborne effluent.

4.0 CNSC Independent Environmental Monitoring Program

The CNSC has implemented its IEMP as an additional verification that Indigenous Nations and communities, the public, and the environment around licensed nuclear facilities are protected. It is separate from, but complementary to, the CNSC's ongoing compliance verification program. CNSC staff findings are supported by IEMP sampling, along with the licensee EP data and ERA predictions. The IEMP involves taking samples from publicly accessible areas around the facilities and analyzing the amount of radiological and hazardous contaminant substances in those samples. CNSC staff collect the samples and send them to the CNSC's laboratory for testing and analysis. The CNSC provides opportunities and funding for Indigenous Nations and communities that have an interest in the CNSC-regulated facilities to participate in IEMP sampling campaigns conducted in their traditional and/or treaty territories.

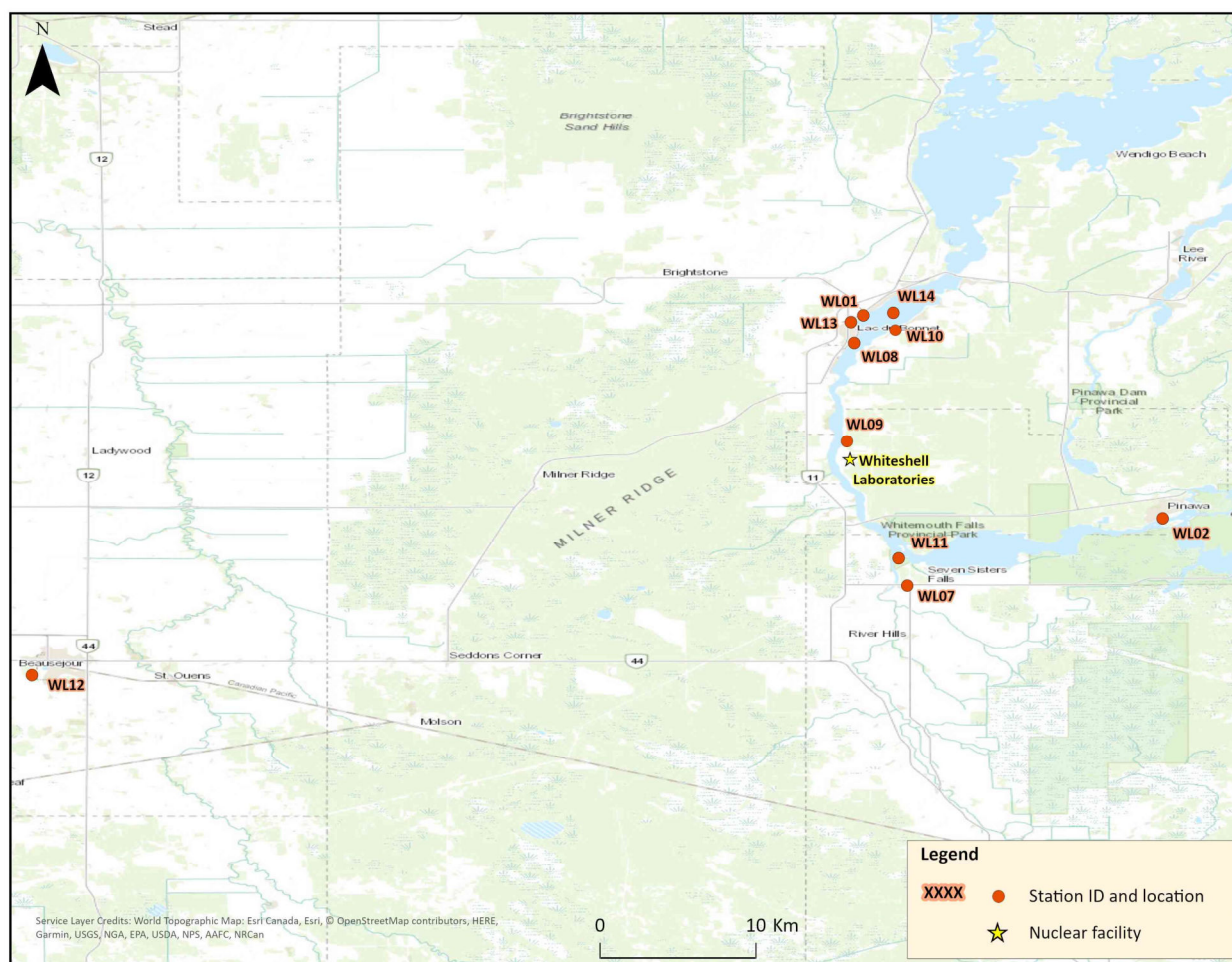
4.1 IEMP at the WL site

CNSC staff conducted IEMP sampling around the WL site in 2017 and 2022. CNSC staff developed the site-specific sampling plans with input from Indigenous Nations and communities to ensure meaningful results were obtained. The sampling plan focused on radiological contaminants considered in CNL's site-wide EMP and the CNSC's regulatory knowledge of the site.

In 2022, CNSC staff collected the following samples in publicly accessible areas outside of the WL site perimeter:

- water (7 samples) – measured levels of tritium, gross beta, and gross alpha
- soil and sediment (7 samples) - measured levels of gamma (americium-241 and cesium-137)
- vegetation (9 samples) - measured levels of cesium-137 and tritium
- fish (3 samples) - measured levels of cesium-137, tritium, and organically bound tritium
- food (7 samples) - measured levels of cesium-137, tritium, and organically bound tritium
- Samples collected were analyzed by qualified laboratory specialists in the CNSC's laboratory in Ottawa, using established protocols.

Figure 4.1 provides an overview of the sampling locations for the 2022 IEMP sampling campaign around the WL site. The IEMP results are published on the CNSC's [Independent Environmental Monitoring Program](#) webpage [7].

Figure 4.1: Overview of the 2022 IEMP sampling locations around the WL site [66]

4.2 Indigenous participation in the IEMP

It is a priority for the CNSC that IEMP sampling reflects Indigenous traditional land use, values, and knowledge, where possible. In 2022, in advance of the IEMP sampling campaign near the WL site, notification emails were sent to all Indigenous Nations and communities near the WL site and invited their suggestions for species of interest, VCs, or potential sampling locations where traditional practices and activities may take place.

In addition to routine IEMP sampling activities, CNSC consulted with local Indigenous Nations and communities and engaged with them during the 2017 and 2022 IEMP campaigns: Sagkeeng Anicinabe First Nation (SAFN), Manitoba Métis Federation (MMF), Hollow Water First Nation (HWFN), and Black River First Nation (BRFN). These meetings provided CNSC staff with the opportunity to collaborate with Indigenous Nations and communities, to learn about their individual histories and cultures, and to address questions related to the operations at the WL site. The following sections summarize CNSC staff's collaboration with each Indigenous Nation and community as part of the WL site IEMP sampling campaigns.

4.2.1 Sampling with the Sagkeeng Anicinabe First Nation

In 2017, CNSC staff worked with SAFN to sample fish in the Winnipeg River. In June 2022, CNSC staff met with SAFN to discuss the IEMP program and review the IEMP sampling plan. On August 8, 2022, CNSC staff were joined by 3 SAFN community members. CNSC staff demonstrated sampling techniques, packaging, and chain of custody procedures. Water, sediment, soil, vegetation (sage, chokecherries, blade grass) were sampled together and the community members showed CNSC staff how to obtain the edible portions of blade grass. The community members also recommended that CNSC staff collect a sample of sage at the Mars Golf Course and CNSC staff sampled this later during that week.

4.2.2 Sampling with the Manitoba Métis Federation

On August 9, 2022, CNSC staff met with a MMF community member who lives near the Winnipeg River. The day before, this community member had caught three types of fish (Northern Pike, Walleye, and Goldeye) from their dock and CNSC staff sampled this fish for analysis. CNSC staff demonstrated sampling techniques for food and water, as well as packaging and chain of custody procedures. The MMF community member then took CNSC staff, by boat, to collect a water sample.

4.2.3 Sampling with the Hollow Water and Black River First Nations

On August 10, 2022, CNSC staff were joined by 9 community members from the HWFN and BRFN. CNSC staff demonstrated sampling techniques for water, soil and vegetation (grass and blade grass) as well as packaging and chain of custody procedures. CNSC staff also answered questions from the community members about the IEMP and the WL site.

Figure 4.2: Collecting blade grass near the Winnipeg River



4.3 Summary of Results

The levels of radioactive substances in all the samples measured during the 2022 IEMP sampling campaign near the WL site were below available guidelines, below CNSC screening levels, and were similar to the range of results from the 2017 IEMP sampling campaign. Results for all sampling campaigns are published on the CNSC's [Independent Environmental Monitoring Program](#) webpage [7].

The CNSC's 2022 IEMP results are consistent with the monitoring results submitted by CNL and support the CNSC's assessment that CNL's EP program for the WL site is effective. The results add to the body of evidence that people and the environment in the vicinity of the site are protected and that there are no anticipated health impacts.

5.0 Other federal environmental monitoring programs

Several monitoring programs are carried out by other levels or bodies of government, and are reviewed by CNSC staff to confirm that the environment and the health and safety of persons around the facility in question are protected. A summary of the findings of these programs is provided below.

5.1 Health Canada's Canadian Radiological Monitoring Network

Health Canada's Radiation Protection Bureau manages the [Canadian Radiological Monitoring Network \(CRMN\)](#) [67] and routinely collects samples for radioactivity analysis from 26 monitoring locations across Canada. Sample types collected include: drinking water, precipitation, atmospheric water vapour, air particulate, and external gamma dose. The closest CRMN monitoring location to the WL site is Winnipeg. The results from the Winnipeg station for 2022 are consistent with data from previous years and are well below the public dose limit of 1 mSv per year.

Health Canada maintains a [Fixed Point Surveillance \(FPS\)](#) system [68]. The FPS functions as a real-time radiation detection system designed to monitor public dose from airborne radioactive materials, including atmospheric emissions associated with nuclear facilities and activities both nationally and internationally. Monitoring stations continuously measure gamma radioactivity levels from ground-deposited (ground-shine) and airborne contaminants.

Health Canada also measures external gamma radiation dose rates as Air KERMA (Kinetic Energy Released in unit Mass of Material) and reports the rates in nanogray per hour (nGy/h) of absorbed dose. Air KERMA accounts for all external gamma radiation which includes natural background radiation as well as radiation from radioactive noble gases (argon-41, xenon-133 and xenon-135) associated with nuclear fission, which may escape into the atmosphere during a nuclear facility's normal operations. These gamma measurements are collected every 15 minutes at 79 sites across Canada. Health Canada's website reports the external absorbed dose from all gamma sources (natural and artificial) as well as the external gamma dose from the 3 monitored noble gases as nanoGray per month. The monthly data is provided on the [Health Canada website](#) [67] and the results are below the public dose limit of 1 mSv per year.

5.2 National Pollutant Release Inventory

As discussed in section 2.4, ECCC operates the NPRI [51], which is Canada's public inventory of pollutant releases, disposals and transfers and tracks over 320 pollutants from over 7,000 facilities across Canada.

Reporting facilities include factories that manufacture a variety of goods, mines, oil and gas operations, power plants, and sewage treatment plants. Information collected includes:

- facility releases to air, water or land
- disposals at facilities or other locations
- transfers to other locations for treatment and recycling
- facilities' activities, location and contacts
- pollution prevention plans and activities

CNSC staff conducted a search of the NPRI database and found only one facility in the Pinawa, Manitoba area (Whiteshell) that reports to the NPRI and 52 facilities in the Winnipeg, Manitoba area that report to the NPRI. While reviewing Whiteshell's NPRI data, CNSC staff saw that the majority of releases reported from this facility were of particulate matter released to air. These releases increased during the years 2011-2013 and again in 2022 and have been attributed to gravel road dust generated on the site coupled with dry weather, excavation, and demolition activities as part of decommissioning. Radionuclides are not included in the NPRI pollutant inventory database but CNSC receives radionuclide loadings data from licensees through other means, i.e., annual reports. This information has been used in this report, but the complete dataset is available for download on the CNSC's [Open Government Portal](#) [69].

6.0 Indigenous environmental monitoring

First Nations and Métis communities are beginning to conduct environmental monitoring around the WL site. The below summaries of these new programs have been provided by Sagkeeng Anicinabe First Nation and Manitoba Métis Federation.

6.1 Sagkeeng Anicinabe First Nation's Niigan Aki Program

Niigan Aki ("Nee-gan Ak-ay"), which means "land first" in Anicinabemowin, is a Guardian Program of the Sagkeeng Anicinabe First Nation community (SAFN). The community is located at the mouth of the Winnipeg River on the southern portion of Lake Winnipeg, approximately 120 kilometers north of the city of Winnipeg, Manitoba. Sagkeeng is signatory to Treaty 1 (1871), Treaty 3 (1873) and Treaty 5 (1875).

Niigan Aki was established after many years of SAFN members noticing changes on the landscape and wanting to create a plan to address them. The need for a Sagkeeng-based monitoring program was highlighted in SAFN's Psycho-Social Impact Assessment [70] that was conducted to understand community perspectives on the future of the WL site. A key recommendation of this assessment was the establishment of a long-term monitoring program based on Sagkeeng values to support the vision that Sagkeeng has for its territory.

Over the last year (2023-2024), the Niigan Aki program has utilized funds provided by AECL and CNL, in addition to the Indigenous Guardians Pilot Initiative of Enhanced Nature Legacy through ECCC to support activities associated with the establishment of the program. A major milestone for the program was the hiring of Brenda Morrisseau, the full-time Aaway-ka-nigan-schum (Program Manager), who has been the primary driver of all foundational materials and program development work. Other important roles within the program include Chi Gaa Gaat Chi Naataamowint Mama Aki Chi Piminopiimatizing (Land-Based Guardian Mentor), and Do-gay-ka-na-nagoon-kay-wat (Guardian). These roles will work together collaboratively to accomplish the overarching goals of the Niigan Aki program.

Program goals

As a result of community engagement and strategic visioning events that occurred in 2023, Niigan Aki developed a Strategic Plan to ensure the program started in a good way in alignment with community priorities. Several goals for Niigan Aki were identified by the community including:

- protection and restoration of the health of the lands and waters
- sustainable and responsible economic development
- strengthening authority and jurisdiction
- revitalization of cultural connections to lands and waters
- community development and programming

These goals are intended to guide the work plan over the next several years and have been broken down into targeted objectives and the associated short, medium, and long-term actions that have three-month to several-year time frames depending on the specific action. The work plan will facilitate the achievement of goals and objectives through project actions which will lead to meaningful and measurable community driven results.

Program activities

As a community-based program, ensuring that Niigan Aki has a strong presence at community events and in collaboration with other programs has been a primary focus over the last year as the program develops. Information booths were established at multiple community events for Niigan Aki to share more about the objectives, goals, and proposed activities both in the long- and short-term future. Furthermore, the Niigan Aki program manager participated in events such as parades and powwows to share with more people about the program activities and purpose. Niigan Aki has also created several initiatives of its own within the community, such as tree planting and incentivized eco-friendly challenges that inspire more sustainable practices by community members.

This level of participation has allowed the greater community to become aware of the Niigan Aki program, while also providing an opportunity for members to contribute to the development of the program by sharing their ideas, thoughts and experiences. These have shaped key program documents, including priority area maps, and the Niigan Aki Strategic Plan and Operations Manual.

Future plans

Work will focus on continuing to establish the Niigan Aki Program within the community and territory while aligning the work with ongoing land rehabilitation efforts. Through this work, Niigan Aki hopes to heal the lands and waters, and in doing so, improve the health and wellness of the community for the next Seven Generations.

Short term actions for the program include utilizing equipment and training outcomes to start consistent environmental monitoring across Sagkeeng territory, community shoreline and riparian zone cleanup, and workshops to re-connect members to the land and culture. Long term actions will address the continued advocacy for Sagkeeng Treaty rights and sovereignty, language revitalization, and development of sustainable practices for economic and agricultural growth. In doing so, the capacity of Niigan Aki is

expected to grow, just as the needs of the Niigan Aki Program to address community concerns and values grows as well.

6.2 Manitoba Métis Federation and CNL Harvesting Sample Collection Plan - 2023

In the years leading up to the pilot Harvester Sample Collection Plan (HSCP), the MMF identified the need for Red River Métis species of interest to be part of CNL's sampling plan. At the time the MMF didn't have capacity to collect the samples alone, and CNL wasn't able to collect these samples in sufficient quantities, in part because CNL's lab requires a minimum sample size of 2kg+ for an array of radiological testing.

In 2022, the MMF proposed the pilot HSCP as a mutually beneficial opportunity to collect adequate sample quantities using Red River Métis harvesters while maintaining industry standard sample collection methodology. As part of this initiative CNL agreed to take custody of samples and have them tested for radiological values, informing the MMF of results as they come back from the lab.

Despite being a pilot project, the HSCP reached the goal of collecting a variety of samples of sufficient size for testing. To date the MMF has collected samples of various fish, berries, wild rice, fiddleheads, firewood, and medicines of interest to our Citizens. We have also succeeded in collecting several species of limited mass such as mushrooms, to be combined with subsequent years of samples to reach the necessary test weight requirements.

MMF Capacity and Cultural Sharing

As a tremendous added value to Red River Métis Citizens, these harvesting events have presented great opportunities to get our knowledge holders and youth together in wild spaces, facilitating knowledge transfer of traditional land use, species and harvesting practices.

To date specific harvesting and knowledge sharing sessions have been held on mushroom, wildlife, plant, and medicine harvesting specific to the Region. These sessions have benefitted MMF staff, summer students and Citizens through workshops and hands on field work.

An additional benefit to come from this work the MMF has begun a medicine mapping project for the project area within a 30km range of the WR-1 site.

Conclusion

This pilot has been a good start to a species of interest monitoring program led by the MMF, however much still needs to be done. Multi-year capacity support will allow the HSCP to collect annual samples of species that can be found in larger quantities and allow for the multi-year amassment of species of very low weight, so that they too can be combined and tested.

Table 6.2 Current Red River Métis Species of Interest for the Project Area

Fruit and berries	Medicinal and edible plants	Wild game	Fish and aquatic species	Firewood & Mushrooms
blue berries raspberries bear berries	wild rice labrador tea	Deer	walleye sauger	birch scrub oak

goose berries	red osier -Dogwood	upland game	perch	poplar
highbush-cranberries	spruce & pine sap and needles	birds (grouse)	mooneye	tamarack
rose hips	bear and	rabbit	crappie	pine
wild plumbs	snake root	duck	sturgeon	reishi
choke cherries	fiddle heads	goose	whitefish	chaga
		muskrat	jackfish	chicken of the woods
				chanterelles
				morels
				lobster-mushrooms

7.0 Health studies

The following section draws from the results of regional health studies, reports, and publications and are used to provide additional confidence on whether the health of people living near the WL site is protected from CNSC licensed activities.

The information provided below first looks at the general health within the community from regional health studies, provincial health studies, and studies on Indigenous Nations and communities (subsection 6.1). This is followed by information from relevant health studies related to radiation exposures associated with nuclear facilities or long-term exposure to low-dose ionizing radiation (subsection 6.2).

Various organizations, such as Interlake Eastern Regional Health Authority, monitor the health of people living near the WL site. In addition, disease rates around the WL site are compared to similar populations to detect any potential health outcomes that may be of concern.

To complement the CNSC's regulatory oversight, CNSC staff continuously work toward strengthening relationships with the various health units and offices. CNSC staff also keep abreast of any new publications and data related to the health of populations living near, or working at, licenced nuclear facilities. Lastly, CNSC staff, at times, conduct health studies on select populations through their research on the effects of low dose (and low dose-rate) exposures. In addition to the regional information, Canadian, and international publications are discussed below. For additional information on health studies related to nuclear facilities, visit the CNSC's web page on [Health Studies](#) [71]

7.1 Population and community health studies and reports

7.1.1 Interlake Eastern Regional Health Authority (2019) and Manitoba Health Statistics (various reports)

The [Interlake-Eastern Regional Health Authority \(RHA\) Community Health Assessment](#) (2019) [72] examined factors that affect the health of people living in areas serviced by the Interlake-Eastern Regional Health Authority (IERHA), and health outcomes within populations that include those near the WL site [73].

The measurement of life expectancy is an important indicator of the health of a population. The average life expectancy for IERHA (82.5 years) was comparable to that of Manitoba (82.8 years). Both male and female life expectancy increased for all RHAs between 2007-2011 and 2012-2016. Notably, females from IERHA had the highest life expectancy (84.7 years).

Similar to the provincial data, cancer and circulatory diseases accounted for the majority of all deaths within the area. Cancer incidence rates for the East zone of the IERHA (where the WL site is located) were similar to the provincial average for 2014 and 2016. The prevalence of related key risk factors was also assessed. Current smokers accounted for 15.1% of the local population, which was consistent with the provincial average (17.5%). Similarly, the percentage of residents that were overweight (32.6%) or obese (21.8%) in IERHA was comparable to provincial values (31.2% and 21.4%, respectively).

The [2022 Health Status of Manitobans Report](#) [74] was developed by the Chief Provincial Public Health Officer of Manitoba and references data published in [The 2019 RHA Indicators Atlas](#) [75] and the [Manitoba Annual Statistics 2020-2021](#) [76]. A consistent improvement in the population health status across all RHAs was observed, even for residents with the lowest income, where total mortality rates were lower over time [75]. Nonetheless, the prevalence of both hypertension and diabetes in males and females had increased over 10 years (2010 to 2020) in the province. In IERHA, the rates from 2016/2017 were significantly higher compared to the provincial average due to the contribution of the West, Selkirk, North and Northern Remote zones, mirroring the prevalence of heart attacks [73].

7.1.2 Cancer Care Manitoba Report

The [Cancer in Manitoba 2020 Annual Statistics Report](#) [77], based on data from the Manitoba Cancer Registry, found lung and bronchus cancer to be the most commonly diagnosed cancer sites in Manitoba (13.5%), followed closely by breast cancer (13.3%). This is consistent with the leading cancer sites for Canada in 2023; however, the cancer incidence rate in Manitoba was slightly lower than the national rate (0.50% vs. 0.51%) [78].

The [Cancer Care Manitoba 2013-14 Community Health Assessment](#) [79] examined cancer risk factors, wait times for screening and treatment, and incidence, mortality, and survival rates. Risk factors for cancer, such as obesity, smoking and alcohol consumption, showed considerable variation by region and were frequently higher in the North. IERHA rates of obesity (28.4%), smoking (24.1%), and alcohol consumption (22.7%) trended higher than provincial averages between 2009 and 2010 (23.4%, 19.6%, 18.2% respectively).

7.1.3 Indigenous Health Status Summary (various studies)

The Indigenous residents within the IERHA account for 27% of the population, higher than the Manitoba average of 18%. Indigenous Peoples of Manitoba (and beyond) unfortunately experience health inequities resulting from colonization and racism. Health disparities are compounded by the fact that many of the larger population surveillance reports may not be able to appropriately describe the needs of Indigenous populations due to data limitations (Interlake-Eastern Regional Health Authority, 2019).

While progress still needs to be made to address these inequities, studies such as the reports and articles reviewed below help bridge the data gap.

7.1.4 Health Status of and Access to Healthcare by Registered First Nations Peoples in Manitoba

The First Nations Health and Social Secretariat of Manitoba, in partnership with the Manitoba Centre for Health Policy, released a [report](#) in 2019 describing the results of a study of First Nation people's health status and access to healthcare [80]. The total mortality rates from 2012 to 2016 for all First Nations was almost double that of all other Manitobans. Differences were also observed between on and off-reserve populations where the rate was higher for First Nations populations living on-reserve. The First Nations population living off-reserve in IERHA was the only one to have significantly lower rates of mortality compared to the

First Nations off-reserve Manitoba average. The three most common causes of mortality for First Nations were external causes, circulatory diseases, and cancer – external causes (self-harm, poisoning, etc.) being most common on-reserve, and circulatory disease off-reserve.

Premature mortality accounted for 81% of all deaths of the First Nations population compared to 35% for all other Manitobans. Populations with a high premature mortality rate are often faced with additional non-health risk factors such as socio-economic challenges (e.g., low income, education levels and employment).

Colorectal (17.05%), lung (13.99%) and breast cancer (13.77%) accounted for the majority of cancer diagnoses from 2005 to 2015. The percentage of colorectal cancer among First Nations was higher compared to all other Manitobans (13.48%).

7.1.4.1 First Nations Regional Health Survey Report (Manitoba Region 2015-2016)

The [First Nations Regional Health Survey](#), carried out in 2015-2016 by Manitoba's Health Information Research Governance Committee, is a cross-sectional survey of First Nations adults, youth, and children living in First Nation communities across Canada [81]. It provides a summary analysis of various indicators of health and well-being among First Nations individuals, families, and communities.

Nearly half of all adults surveyed reported that they had been diagnosed with one or more chronic health conditions, with diabetes, high blood pressure/hypertension, and arthritis ranking among the top three. This is a smaller proportion when compared to the national survey, where 60% of adults reported one or more conditions. Nearly half of the adults surveyed were obese according to BMI measures and almost one third were overweight, which correlated with having one or more health conditions. Almost half of all adults were daily smokers, with an additional 15% smoking occasionally. These rates for obesity and smoking were higher than provincial averages (21.4% and 17.5%, respectively) [73].

7.1.4.2 Profile of Métis Health Status and Healthcare Utilization in Manitoba: A Population-Based Study (Updated 2012)

The Manitoba Centre for Health Policy at the University of Manitoba, in collaboration with the Manitoba Métis Federation, conducted a population-based [study](#) to profile Métis health status and healthcare utilization in Manitoba [82]. While the report was last updated in 2012, a renewal of this project is currently being undertaken. At the time of this report, residents living near the WL Site were serviced by the North Eastman Regional Health Authority (NERHA) within the Southeast Region of Manitoba.

While Métis citizens in general had higher mortality rates than all other Manitobans from 2002 through 2006, total and premature mortality rates for Métis living in the Southeast Region and in the NERHA area were significantly lower than the Manitoba average rates for Métis. The top two causes of death for both Métis and Manitobans were cancers and diseases of the circulatory system, accounting for over half of all deaths. NERHA Métis had higher hypertension prevalence in 2006/2007, but lower respiratory morbidity than the Métis Manitoba average. From 2004 to 2007, diabetes prevalence among NERHA Métis was lower than the Manitoba average, and cataract surgery rates were lowest for NERHA Métis compared to all other Manitobans and Regional Health Authorities (RHAs). From 2002 to 2007, ischemic heart disease prevalence in NERHA Métis was similar to the Manitoba Métis average; by contrast, heart attack rates were significantly lower compared to all other Manitobans and RHAs. Cancer and disease risk factors also exhibited some variance across NERHA Métis, with some values higher (e.g., BMI, fruit and vegetable consumption) and others lower (e.g., current smokers) than the Métis Manitoba average.

7.1.4.3 A Review of Health and Wellness Studies Involving Inuit of Manitoba and Nunavut (2020)

A [review](#) on health and wellness studies involving Inuit of Manitoba and Nunavut was undertaken in 2020 [83] using a scoping framework defined by the Canadian Institutes of Health Research [83]. Findings included significantly higher incidences of lung cancer in Inuit than in non-Inuit, noting tobacco use as an important cancer risk factor. Some studies reported lower blood pressure among the Inuit, though one study reported the highest blood pressures among the Kivalliq Inuit, and noted the importance of risk factor considerations such as diet, lifestyle, genetics, age, gender, obesity, and smoking.

7.2 Current scientific understanding of radiation health effects

The current scientific knowledge about the sources, effects and risks of ionizing radiation is reviewed and published by the international experts that make up the [United Nations Scientific Committee on the Effects of Atomic Radiation](#) (UNSCEAR) [84]. This information comes from population studies, animal and cell studies, and clinical investigations. These studies build the foundation of knowledge about the relationship between radiation exposure and health effects, such as cancer. This knowledge, in turn, informs the recommendations of the [International Commission on Radiological Protection](#) (ICRP) [85], which focuses on protecting human health.

7.2.1 Canadian Studies of Radiation Health Effects

Epidemiological studies involving nuclear facilities provide insight on populations living near or working at these sites. The levels of exposure in local area residents and workers are low, and there is no evidence of adverse health effects resulting from past and present nuclear operations or activities in the region. These findings are consistent with the select important Canadian and international studies of radiation effects on human health in similar populations, described below.

7.2.1.1 Radiation Exposure and Cancer Incidence (1990 to 2008) Around Nuclear Power Plants in Ontario, Canada (RADICON)

In 2013, the CNSC conducted a study on radiation exposure and cancer incidence around Ontario nuclear power plants. The [RADICON](#) study [86] derived radiation doses received by members of the public living within 25 km of the Pickering, Darlington and Bruce nuclear power plants, and compared cancer cases among this subset of the population with cases among the general population of Ontario from 1990 to 2008. The main findings were that there was no consistent pattern of cancer and no evidence of childhood leukemia clusters around the three Ontario nuclear power plants. Some types of cancer were higher than expected, but others were lower or similar. Variations in all cancers combined and radiosensitive cancers were within the natural variation of cancer in Ontario.

7.2.1.2 Verifying Canadian Nuclear Energy Worker Radiation Risk: A Reanalysis of Cancer Mortality in Canadian Nuclear Energy Workers (1957–1994)

In 2011, the CNSC published a study entitled [Verifying Canadian Nuclear Energy Worker Radiation Risk: A Reanalysis of Cancer Mortality in Canadian Nuclear Energy Workers \(1957–1994\)](#) [87]. CNSC staff also published this work in the scientific literature [88]. An analysis of 42,228 Canadian nuclear workers (including workers from Atomic Energy Canada Limited) provided no evidence of increased risk of cancer mortality between 1964 and 1994. Canadian workers had lower all-cause and solid cancer mortality compared with the general Canadian population.

7.2.1.3 International studies of radiation health effects

The epidemiological evidence of radiation-related health effects comes from several main research populations. These populations include the lifespan studies of atomic bomb survivors (LSS) [89] [90] [91], people involved in the Chernobyl disaster [92] [93], patients treated with radiotherapy for cancer and non-cancer diseases [94], and miners exposed to radon and radon decay products [95] [96].

The largest and most relevant study is the International Nuclear Worker Study (INWORKS), a multinational cohort study that assessed cancer risk from 1943 to 2005 in 309,932 workers from the nuclear industry in France, the United Kingdom, and the United States [97] [98] [99] [100] [101]. According to the 2023 INWORKS study [101], the risk of radiation-induced solid cancer mortality resulting from chronic exposure to low doses of radiation may be slightly higher than previously reported. The study supports a linear association between prolonged low dose external exposure to ionizing radiation and solid cancer mortality. These findings are consistent with the LSS as well as the use of the linear no-threshold model that underpins the system of radiological protection, and thus the CNSC regulatory dose limits.

The major findings consistent with all of these studies are:

- excess risk of cancer increases as radiation dose increases
- statistically significant population effects are typically observed at doses above approximately 100 mSv (either acutely or chronically exposed)
- at doses of 100 mSv (received acutely or chronically), the risk of developing cancer increases by approximately 0.5% above background cancer risk, which in Canada is approximately 45% (resulting in a total risk of 45.5%)

Importantly, the absence of statistically significant data does not indicate the absence of risk. To put these findings into perspective, for nuclear energy workers from the facility, lifetime dose would fall below 100 mSv, given that the maximum effective dose received is less than 1 mSv per year (0.31 mSv in 2022) [102]. In comparison, members of the public living near the WL site have typically received annual incremental doses equal to or less than 0.002 mSv per year, resulting in negligible lifetime doses.

Doses to workers and members of the public from the operation of nuclear facilities are in addition to the average natural background radiation in Canada of 1.8 mSv per year, which varies between 1 and 4 mSv per year [103].

7.2.1.4 Findings

The existing body of knowledge on various populations is used by CNSC staff to help determine the health and safety of workers and persons living near the WL site, in the absence of substantial population-specific studies with radiation exposure data.

Experts worldwide study radiation health effects to provide objective scientific evidence, which supports licensee environmental and radiation protection programs, ensuring that workers and members of the public are protected. The current international understanding is that low doses of radiation are associated with low risks to health, indiscernible from the natural variation of disease. CNSC staff are confident that those living near, and working at, any nuclear facility in Canada are adequately protected.

7.3 Summary of health studies

Reviewing and conducting health studies and reports are important to help ensure the protection of people living near or working at nuclear facilities. Population and community health studies and reports indicate

that cancer incidence and mortality rates, as well as the prevalence of specific health indicators and risk factors related to cancer, are largely consistent between this population and the population of Manitoba as a whole. Rates of diseases may vary, as, for example, Manitoba's cancer cases are influenced by age and size of the population, as well as risk factors such as unhealthy living [77].

Health discrepancies are observed between Indigenous Peoples and all other Manitobans due in large part to the inequalities that they face. Public health authorities can help improve these outcomes through new policy and initiatives informed through holistic population health studies focusing on Indigenous health and wellbeing.

The current understanding of the risks associated with radiation exposures is supported by publications of international agencies like UNSCEAR and the ICRP, as well as academics and researchers worldwide. Very low exposures of radiation (like those experienced by Pinawa residents and WL site employees) result in very low risks to health, indiscernible from the natural variation of disease.

In conclusion, the health studies and reports presented in this section provide a snapshot of the health of people living near the WL site. Based on CNSC staff's assessment of radiation and environmental exposures from the site and available health data, CNSC staff have not observed and do not expect to observe any adverse health outcomes attributable to the operation of the WL site.

8.0 Recommendations and Findings

This EPR report focused on items of current Indigenous, public, and regulatory interest, including physical stressors, and airborne and waterborne releases from ongoing operations at the WL site. CNSC staff have found that the potential risks from physical stressors, as well as from radiological and hazardous releases to air, water and soil from the WL site are negligible and that people and the environment remain protected.

8.1 CNSC staff's follow-up

The following list summarizes CNSC staff's comments regarding the EP measures implemented by CNL for the WL site. The following are not expected to change CNSC staff's findings and are included for transparency with Indigenous Nations and communities and the public. It is CNSC staff's expectation that CNL will:

- Submit revised site-wide ERA C prior to the WL site licence renewal hearing in October 2024, to address CNSC and ECCC staff's technical comments and recommendations

Upon CNSC staff's acceptance of CNL's ERA this EPR report will be revised to include assessment of current and predicted effects on the environment and health and safety of persons due to licensed activities at the WL site.

8.2 CNSC staff's findings

CNSC staff reviewed CNL's licence application and the documents submitted in support of the application, such as the DDP, submitted draft site-wide ERA and annual reports, with respect to EP. CNSC staff also reviewed the results from various relevant health studies and regional monitoring programs conducted by other levels or bodies of government, which substantiate CNSC staff's findings are that the environment and health of persons are protected from ongoing activities at the WL site. CNSC staff look forward to learning more from the newly initiated environmental monitoring programs by SAFN and MMF.

CNSC staff have also conducted IEMP sampling around the WL site in 2017 and 2022. IEMP results support CNSC staff's findings that the public and the environment around the WL site are protected and that there are no health impacts as a result of ongoing activities. These results are also consistent with the results submitted by CNL, demonstrating that the licensee's environmental programs protect the health of persons and the environment.

This EPR focused on items of current public and regulatory interest, including airborne and waterborne releases from ongoing operations. CNSC staff found that the potential risks from radiological and hazardous releases to air, water and soil from CNL's WL site are low to negligible. The potential risks to the environment for these releases are not distinguishable from natural background and the potential risk to humans is similar to health outcomes in the general public.

The EPR conducted for the licence application to renew CNL's current Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5 8.00/2024 for the WL site, found that CNL has and will continue to make adequate provision for the protection of the environment and the health of persons. CNSC staff will continue to verify and ensure that, through ongoing licensing and compliance activities and reviews, the environment and the health of persons are protected and will continue to be protected over the proposed licence period.

The information provided in this EPR supports the recommendation by CNSC staff in CMD 24-H7 to renew CNL's Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5 8.00/2024 for the WL site.

9.0 Abbreviations

AECL	Atomic Energy Canada Limited
Air KERMA	Air Kinetic Energy Released in Unit Mass of Material
AL	Action Level
ALARA	As Low As Reasonably Achievable
ALWTC	Active Liquid Waste Treatment Center
B100	Building 100
B300	Building 300
BDBA	Beyond design basis accident
BRFN	Black River First Nation
Bq	Becquerel
CANDU Reactor	Canada Deuterium Uranium Reactor
CCSF	Concrete Cannister Storage Facility
CEAA 1992	<i>Canadian Environmental Assessment Act, 1992</i>
CEAA 2012	<i>Canadian Environmental Assessment Act, 2012</i>
CEPA	<i>Canadian Environmental Protection Act</i>
CMD	Commission Member Document
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
COPC	Contaminant of potential concern
CRMN	Canadian Radiological Monitoring Network
CSA	Canadian Standards Association
CSR	Comprehensive Study Report
DDP	Detailed Decommissioning Plan
DFO	Department of Fisheries and Oceans Canada
DRL	Derived releases limit
EA	Environmental assessment
ECCC	Environment and Climate Change Canada
EMP	Environmental monitoring program
EMS	Environmental management system
EP	Environmental protection
EPP	Environmental protection program

EPR	Environmental protection review
ERA	Environmental risk assessment
EVMP	Effluent Verification Monitoring Plan
FPS	Fixed Point Surveillance
GHG	Greenhouse gas
Ha	Hectares
HHRA	Human health risk assessment
HLW	high-level wastes
HSCP	Harvester Sample Collection Plan
HWFN	Hollow Water First Nation
IA	Impact assessment
IAA	<i>Impact Assessment Act of Canada</i>
ICRP	International Commission on Radiological Protection
IEMP	Independent Environmental Monitoring Program
IERHA	Interlake-Eastern Regional Health Authority
ILW	intermediate radioactive wastes
INWORKS	International Nuclear Worker Study
ISO	International Organization for Standardization
Kg	Kilogram
Km	kilometres
LCH	Licence conditions handbook
LLW	low-level radioactive wastes
LSS	lifespan studies of atomic bomb survivors
NERHA	North Eastman Regional Health Authority
NPRI	National Pollutant Release Inventory
NRTEOL	nuclear research and test establishment operating licence
NSCA	<i>Nuclear Safety and Control Act</i>
MMF	Manitoba Métis Federation
MOU	Memorandum of Understanding
mSv	Millisievert
Mg	Milligram
PDP	Preliminary decommissioning plan
PM	Total particulate matter

RADICON Study	Radiation and Incidence of Cancer Around Ontario Nuclear Power Plants, 1990 to 2008
RHA	Regional Health Authority
ROR	Regulatory oversight report
SAFN	Sagkeeng Anicinabe First Nation
SAR	Safety analysis report
SARA	<i>Species at Risk Act</i>
SF	Shielded Facilities
TSS	Total suspended solids
UNSCEAR	United Nations Scientific Committee on the Effects of Atomic Radiation
VC	Valued component
WL	Whiteshell Laboratories
WMA	Waste Management Area
WR-1	Whiteshell Reactor 1

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PART 2

Part 2 of this CMD provides all relevant information pertaining directly to the licence, including:

1. The current licence;
2. Any proposed changes to the conditions, licensing period, or formatting of an existing licence;
3. The proposed licence; and
4. The draft licence conditions handbook.

Current Licence

CNL currently operates Whiteshell Laboratories under the Nuclear Research and Test Establishment Decommissioning Licence, NRTEDL-W5-8.00/2024. The proposed licence incorporates the standard licence conditions and standard format.

e-Doc 6578071 (Word)

e-Doc 6997735 (PDF)



e-Doc 6578071 (WORD)

e-Doc 6997735 (PDF)

LICENCE CONDITIONS HANDBOOK

NRTEDL-LCH-08.00/2024

WHITESHELL LABORATORIES

**NUCLEAR RESEARCH AND TEST
ESTABLISHMENT DECOMMISSIONING LICENCE**

NRTEDL-W5-8.00/2024

Revision 1



Licence Conditions Handbook
NRTEDL-LCH-08.00/2024, Revision 1
Whiteshell Laboratories
Nuclear Research and Test Establishment
Decommissioning Licence
NRTEDL-W5-8.00/2024

Effective: April 3, 2023

SIGNED at OTTAWA this 31 day of March 2023



Kimberley Campbell, Director

Canadian Nuclear Laboratories Regulatory Program Division
Directorate of Nuclear Cycle and Facilities Regulations
CANADIAN NUCLEAR SAFETY COMMISSION

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INTRODUCTION

The general purpose of the Licence Conditions Handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition. This will help ensure that the licensee performs the licensed activities at the Whiteshell Laboratories (WL) in accordance with the licensing basis for WL and the intent of the WL licence. The LCH should be read in conjunction with the licence.

The LCH typically has three parts under each licence condition: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains, as needed, the regulatory context, background, and/or history related to the licence condition. CVC are criteria used by Canadian Nuclear Safety Commission (CNSC) staff to verify and oversee compliance with the licence condition. Guidance is non-mandatory information, including direction, on how to comply with the licence condition.

The documents referenced in the LCH by e-Access numbers are not publicly available. The links provided in the LCH are references to the internal CNSC electronic filing system, and those documents cannot be opened from outside of the CNSC network.

Current versions of the licensing basis publications, licensee documents that require notification of change, and guidance documents referenced in the LCH are tracked in the document *Licensing Documents for Whiteshell Laboratories-WL-Specific* (e-Doc [5776580](#)) and *-Company-Wide* (e-Doc [5507946](#)), which are controlled by the Canadian Nuclear Laboratories Regulatory Program Division and are available to the licensee upon request.

Most CNSC documents referenced in the LCH are available through the CNSC public website. Documents listed on the CNSC website may contain prescribed information as defined by the *General Nuclear Safety and Control Regulations*. Information in these documents will be made available only to stakeholders with appropriate security clearance on a valid need to know basis.

The licensee documents referenced in the LCH are not publicly available; they contain proprietary information or prescribed information as defined by the *General Nuclear Safety and Control Regulations*.

Domestic and international standards (in particular consensus standards produced by the Canadian Standards Association (CSA) Group) are an important component of the CNSC's regulatory framework. Standards support the regulatory requirements established through the *Nuclear Safety and Control Act* (NSCA), its regulations and licences by setting out the necessary elements for acceptable design and performance at a regulated facility or a regulated activity. Standards are one of the tools used by the CNSC to evaluate whether licensees are qualified to carry out licensed activities.

The CNSC offers complimentary access to the CSA Group [suite of nuclear standards](#) through the CNSC website. This access platform allows interested stakeholders to view these standards online through any device that can access the Internet.

Up to date lists of the nuclear and support facilities at WL that are subject to CNSC regulatory oversight, and legacy facilities that were placed under care and maintenance or undergoing decommissioning under buildings removal plans, are maintained in the Canadian Nuclear Laboratories (CNL) document 900-514300-LST-001, *Site Licences, Certificates, Permits, Facilities and Representatives*.

INTRODUCTION

Appendix A to the LCH provides definitions of terms and a list of acronyms used throughout it. More information on the LCH is available in the CNSC document titled *How to Write a Licence Conditions Handbook* (LCH) (e-Doc [4967591](#)).

INTRODUCTION

G. GENERAL

Licence Condition G.1: Licensing Basis

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

- (i) the regulatory requirements set out in the applicable laws and regulations;**
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and**
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;**

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble:

The licensing basis sets the boundary conditions for acceptable performance at a regulated facility or activity, and thus establishes the basis for the CNSC's compliance program in respect of that regulated facility or activity. The degree to which the regulatory requirements are applied to WL facilities and activities should reflect their importance to health and safety of persons, environment, national security, international obligations to which Canada has agreed, licensee's quality and economic expectations, the complexity of facility or activity, and the possible consequences if accidents occur or the activity is carried out incorrectly.

Where the licence condition requires the licensee to implement and maintain a particular program, the licensee documents that describe and implement the program are part of the licensing basis. Programs required by licence conditions or referred to in the LCH may or may not be health, safety, security, environment, and quality programs as defined in the Canadian Nuclear Laboratories Ltd. (CNL)'s management system.

Compliance Verification Criteria:

Part (i) of the Licensing Basis

Part (i) of the licensing basis refers to applicable laws and regulations. There are many federal and provincial acts and regulations, and international laws, agreements, guidelines, etc., applicable to activities performed at WL.

The laws, regulations and international agreements for which CNSC has a regulatory role are:

- *Nuclear Safety and Control Act (NSCA) and its regulations;*
- *Canadian Environmental Assessment Act, 2012 (CEAA, 2012) and its regulations;*
- *Transportation of Dangerous Goods Act and its regulations;*
- *Canada Labour Code and Canada Occupational Health and Safety Regulations;*
- *Nuclear Liability and Compensation Act and its regulations;*
- *Fisheries Act (CNSC responsibilities are defined in the Memorandum of Understanding between the CNSC and Fisheries and Oceans Canada); and*
- *Canada/IAEA safeguards agreements.*

GENERAL

All Memoranda of Understandings between the CNSC and other regulatory agencies or government departments are available on the CNSC Webpage under [Acts and Regulations/Domestic Arrangements](#).

Through its decision of October 22, 2014, the Commission, pursuant to section 7 of the NSCA, exempted CNL from the requirements of sections 15.01 and 15.02 of the CNSC *Class II Nuclear Facilities and Prescribed Equipment Regulations* in relation to the requirement for a certified radiation safety officer (e-Doc [4543516](#)).

Part (ii) of the Licensing Basis

Part (ii) of the licensing basis refers to the conditions and the safety and control measures included in the WL licence and in the documents directly referenced in the licence.

Under the standardized format and content, the WL licence requires the licensee to implement and maintain certain programs. For the purpose of meeting a licence requirement, a program may be a series of documented, coordinated activities, not necessarily a single document.

Part (iii) of the Licensing Basis

Part (iii) of the licensing basis refers to the safety and control measures described in the licence application and the documents needed to support that licence application. The safety and control measures include important aspects of that documentation such as, but not limited to: the facility-specific design basis and operational information documented in the most recent safety analysis and operational limits and conditions documents.

Part (iii) of the licensing basis also includes safety and control measures outlined in CNSC regulatory documents, CSA standards, and other standards, codes and references that are cited in the application or in the licensee's supporting documentation.

Applicable licensee documents are listed in the LCH under the heading "Licensee Documents that Require Notification of Change". Applicable CNSC regulatory documents, CSA standards and other documents are listed in the LCH under the heading "Licensing Basis Publications". The licensee documents listed in the LCH could cite other documents that also contain safety and control measures (i.e., there may be safety and control measures in "nested" references in the application). The licensee documents listed in the LCH and their "nested" references define the licensing basis for the programs required by the WL licence as long as they include safety and control measures.

Regulatory Role of the Licensing Basis

The licensing basis is established when the Commission renders its decision regarding the licence application.

Licence condition G.1 requires the licensee to conduct the licensed activities in accordance with the licensing basis. For activities that are found to be not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state consistent with the licensing basis, taking into account the risk significance of the situation.

The applicability of the licensing basis publications may be graded based on the specific of activity being considered.

CNSC Staff's Approach to Assessing the Licensing Basis for Whiteshell Laboratories

The licence condition G.1 is not intended to unduly inhibit the ongoing management and operation of the facility or the licensee's ability to adapt to changing circumstances and continuously improve, in accordance with its management system. Where the licensing basis refers to specific configurations, methods, solutions, designs, etc., the licensee is free to propose alternate approaches as long as they remain, overall, in accordance with the licensing basis and have a neutral or positive impact on health, safety, the environment, security, and safeguards. However, the licensee shall assess changes to confirm that operations remain in accordance with the licensing basis. The assessment shall be documented and made available to CNSC staff upon request.

For any proposed activity to be carried out on the WL, CNSC staff will review the information submitted by CNL to independently determine if the proposed activity remains within the licensing basis. CNSC staff assess a proposed activity as being within the licensing basis based on the hazard and risk of the change, and its impact on the overall safety of the WL.

CNSC staff will submit to the Commission for consideration any proposed activity which CNSC staff consider to be outside the licensing basis. If the Commission grants approval to such an activity, it will become part of the licensing basis for WL and reflected in updates to LCH as appropriate.

Activities Included in the Whiteshell Laboratories Licensing Basis

Conduct of licensed activities at WL includes:

- a) operate and decommission the Whiteshell Laboratories (hereinafter "WL") located in Pinawa, Province of Manitoba as further described in the Whiteshell Laboratories Licence Conditions Handbook (LCH),
- b) produce, possess, process, refine, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),
- c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
- d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a),
- e) carry out the site preparation, construction or construction modification or undertaking that is required for, associated with or arise from the activities described in a).

A complete list of all nuclear facilities at WL is found in 900-514300-LST-001, "Site Licences, Certificates, Permits, Facilities and Representatives".

Licence Application Documents and Supporting Documents

Document Number	Document Title	e-Doc
WLD-CNNO-18-0033-L	Application for Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories	5715784
WLD-CNNO-18-0034-L	Application for Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories (Supporting Information for CNSC Staff)	5715800

Guidance:

The CNSC regulatory document REGDOC-3.5.3, *Regulatory Fundamentals*, outlines the CNSC's regulatory philosophy and approach to applying the *Nuclear Safety and Control Act*. It provides information for licensees, applicants and the public, and contains neither guidance nor requirements. In particular, subsection 6.1.1 of the REGDOC-3.5.3 provides information about the licensing basis.

When the licensee becomes aware that a proposed change or activity might be outside the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them.

Licence Condition G.2: Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble:

Most changes to the WL and its facilities are captured as changes to corresponding licensee's documents. The LCH identifies licensee documents that require written notification of changes to the CNSC.

Compliance Verification Criteria:

The licensee shall, as a minimum, notify CNSC staff of changes to licensee's documents identified in the LCH. The written notification of change shall include a copy of the revised document and a description of the change.

CNL program requirements documents (PRDs) and program description documents (PDDs) are accompanied by governing document indices (GDIs). The licensee shall provide updated versions of PDDs quarterly and GDIs annually or upon request from CNSC.

Licensee documents listed in the LCH are subdivided into groups having different requirements for notification of change.

Prior Notification Requirement	Definition
Requires prior notification	<p>The licensee shall submit the revised document to the CNSC as far in advance of planned implementation as practicable, but not less than 30 days prior to planned implementation. The licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. This is denoted by a Y in the column "prior notification".</p> <p>Where a document or some part of it requires acceptance by CNSC staff prior to implementation, a footnote has been added to the notification column.</p>
Requires notification at time of implementation	<p>The licensee shall notify the CNSC at the time of implementing a revised document. This is denoted by a N in the column "prior notification".</p>

Changes that may affect the licensing basis, including any change that is not captured as a change to a document listed in the LCH (e.g., construction of new facilities/buildings, transitioning any facility/building from one phase of its life cycle to another, or infrastructure improvements at WL), requires written prior notification to the CNSC to verify they are in accordance with the licensing basis.

For any change that is outside the licensing basis defined in subsection G.1 of the LCH, the licensee shall obtain Commission approval before proceeding with the change.

GENERAL

Guidance:

For proposed changes that would not be in accordance with the licensing basis, the guidance for licence condition G.1 applies.

Licence Condition G.3: Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble:

The *General Nuclear Safety and Control Regulations* requires that a licence application contains “a description of any proposed financial guarantee relating to the activity to be licensed”.

The financial guarantee for decommissioning is to be reviewed and revised by the licensee every 5 years, or; when required by the Commission or person authorized by the Commission, or; following a revision to the cost estimate for decommissioning if it significantly impacts the financial guarantee.

The financial guarantee for WL is in the form of an expressed commitment from Atomic Energy of Canada Ltd (AECL) which is a Schedule III, Part 1 Crown Corporation under the *Financial Administration Act* and an agent of Her Majesty in Right of Canada. As an agent of Her Majesty in Right of Canada, AECL’s liabilities are ultimately liabilities of Her Majesty in Right of Canada. While the restructuring of AECL has seen the ownership of Canadian Nuclear Laboratories Ltd. (CNL) transferred to a private-sector contractor, the Canadian National Energy Alliance (CNEA), AECL retains ownership of the lands, assets and liabilities associated with CNL’s licences. These liabilities have been officially recognized by the Minister of Natural Resources in a letter dated July 31, 2015 and was reaffirmed in 2020 (e-Doc [4803454](#), [6373440](#), [6373441](#), [6373442](#)).

Compliance Verification Criteria:

The financial guarantee for decommissioning shall be reviewed and revised by the licensee every 5 years, when requested by the CNSC, or following a revision to the cost estimate for decommissioning or changes to the decommissioning strategy which significantly impacts the financial guarantee.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.3.1	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	2021	March 31, 2022

Guidance:

None provided.

Licence Condition G.4: Public Information and Disclosure Program

The licensee shall implement and maintain a public information and disclosure program.

Preamble:

Class I Nuclear Facilities Regulations require that an application for a licence shall contain the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.

The primary goal of the public information program, as it relates to the licensed activities, is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of nuclear facilities are effectively communicated to the public. The public information program includes a public disclosure protocol describing the information and the medium of disclosure in regard to information and reports of interest to the public.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.2.1	Public Information and Disclosure	2018	December 8, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
CW-513430-REPT-001	Public Information Program for Canadian Nuclear Laboratories (CNL)	5507946	N

Guidance:

None provided.

SCA – MANAGEMENT SYSTEM

Licence Condition 1.1: Management System

The licensee shall implement and maintain a management system.

Preamble:

Safe and reliable operation of nuclear facilities requires a commitment and adherence to a set of management system principles and, consistent with those principles, the implementation of planned and systematic processes that achieve expected results. The management system focuses on safety in all business activities and supports the safe conduct of licensed activities at CNL.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.

The *General Nuclear Safety and Control Regulations* require that a licence application contain the applicant's organizational management structure, including the internal allocation of functions, responsibilities and authority.

The management system is in place to satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system. The management system promotes and supports a healthy safety culture. Characteristics of a healthy safety culture are as follows:

- Safety is a clearly recognized value;
- Accountability for safety is clear;
- Safety is integrated into all activities;
- A safety leadership process exists; and
- Safety culture is learning driven

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N286	Management system requirements for nuclear facilities	2012 (R2022)	January 1, 2020
CSA N286.6	Decommissioning Quality Assurance for Nuclear Power Plants	1998 (R2003)	January 1, 2020
REGDOC-2.1.2	Management System: Safety Culture	2018	January 1, 2020

SCA – MANAGEMENT SYSTEM

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-514100-MAN-001	Management System Manual	5507946	Y
900-514200-PDD-001	Quality	5507946	N
900-514200-PRD-001	Quality	5507946	Y
900-514100-LST-001	Functional Authorities	5507946	N
900-514300-LST-001	Site Licences, Certificates, Permits, Building/Facility Contacts, & Licence Representatives	5507946	N
900-514100-LST-002	Codes, Regulations, Standards, and other Documents	5507946	N
WLD-508300-QAP-001	Whiteshell Laboratories Decommissioning QA Plan	5776580	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities	2014

SCA – HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1: Human Performance Program

The licensee shall implement and maintain a human performance program.

Preamble:

Human performance is the outcome of human behaviours, functions and actions in a specified environment, reflecting the ability of workers and management to meet the system's defined performance under the conditions in which the system will be employed.

Human factors are factors that influence human performance as it relates to the safety of a nuclear facility or activity over all the phases, including design, operation, maintenance, and decommissioning. These factors may include the characteristics of the person, task, equipment, organization, environment, and training. The application of human factors to issues such as interface design, training, procedures, organization and job design may affect the reliability of humans performing tasks under various conditions.

The human performance program addresses and integrates the range of human factors that influence human performance, including but not limited to:

- The provision of qualified workers;
- The reduction of human error;
- Organizational support for safe work activities;
- The continuous improvement of human performance; and
- Monitoring hours of work.

The *General Nuclear Safety and Control Regulations* require the licensee to: ensure the presence of sufficient number of qualified staff; train the workers; and ensure the workers follow procedures and safe work practices.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed human performance program for the activity to be licensed, including measures ensure workers fitness for duty.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	January 1, 2020
REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3 ¹	2021	January 27, 2022
REGDOC-2.2.4	Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness	2018	January 1, 2020

SCA – HUMAN PERFORMANCE MANAGEMENT

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-514000-PDD-001	Program Description Document: Performance Assurance	5507946	N
900-514000-PRD-001	Program Requirements Document: Performance Assurance	5507946	Y

¹ Fully implemented with the exception of random alcohol and drug testing of workers in safety-critical positions (e-Doc [6732074](#)).

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.2.5	Minimum Staff Complement	2019

Licence Condition 2.2: Training Program

The licensee shall implement and maintain a training program.

Preamble:

This licence condition requires the licensee to develop and implement training programs for workers.

It also provides the requirements regarding the program and processes necessary to support responsibilities of, qualifications and requalification training of persons at the nuclear facility.

As defined by the *General Nuclear Safety and Control Regulations*, a worker is a person who performs work that is referred to in a licence. This includes contractors and temporary employees. Training requirements apply equally to these types of workers as to the licensee's own employees.

The *General Nuclear Safety and Control Regulations* require that licensees ensure that there are a sufficient number of properly trained and qualified workers to safely conduct the licensed activities.

The *Class I Nuclear Facilities Regulations* require that applicants for a Class I facility licence describe the training programs which have been implemented, and that licence applications include the proposed responsibilities, qualification requirements, training program and requalification program for workers; along with the results that have been achieved in implementing the program for recruiting, training and qualifying workers.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.2	Personnel Training, version 2	2016	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-510200-PDD-001	Program Description Document: Training and Development	5507946	N
900-510200-PRD-001	Program Requirements Document: Training and Development	5507946	Y
900-510200-LST-001	Application of the Systematic Approach to Training	5507946	N

The licensee shall ensure that all workers are qualified to perform the duties and tasks required of their position.

Guidance:

None provided.

SCA – OPERATING PERFORMANCE

Licence Condition 3.1: Operating Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures, policies, methods and procedures for safely operating and maintaining the nuclear facility.

The operational limits and conditions for WL are currently documented in

- Facility Authorizations, and
- laboratory protocols, criticality safety documents and other documents for other workplaces where operations with fissionable materials are performed involving handling, use, processing, movement and storage

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-505240-PDD-001	Program Description Document: Construction	5507946	N
900-505240-PRD-001	Program Requirements Document: Construction	5507946	Y
900-505250-PDD-001	Program Description Document: Commissioning	5507946	N
900-505250-PRD-001	Program Requirements Document: Commissioning	5507946	Y
CCSF-00583-FA-001	Facility Authorization for the Operation of the Concrete Canister Storage Facility at Whiteshell Laboratories	5776580	Y ¹
WLSF-00583-FA-001	Facility Authorization for the Operation of the Shielded Facilities at Whiteshell Laboratories	5776580	Y ¹
WLWMA-00583-FA-001	Facility Authorization for the Operation of the Waste Management Area at Whiteshell Laboratories	5776580	Y ¹

¹ Notification is required only for non-administrative changes. If administrative changes are made, the licensee shall provide updated facility authorizations to CNSC staff at the end of the next quarter.

SCA – OPERATING PERFORMANCE

WL Facilities Operations

The operational limits and conditions shall define the conditions that must be met to prevent situations or events that might lead to accidents, or to mitigate the consequences of accidents should they occur. The updated operational limits and conditions shall be based on safety analyses.

Limits and conditions for normal operation shall include limits on operating parameters, stipulation for minimum amount of operable equipment, actions to be taken by the operating staff in the event of deviations from the operational limits and conditions, and the time allowed for completing these actions.

The licensee shall review, revise and reissue as appropriate the operational limits and conditions when required due to changes in technologies, regulations, operational information or physical configuration.

Construction and operation of New Nuclear Facilities

The licensee may construct or install facilities, buildings, structures, components or equipment only if that construction or installation is compliant with the licensing basis.

Facilities in Permanent Safe Shutdown State

The licensee shall develop and maintain storage-with-surveillance plans (SWS plans) for Class I and Class II nuclear facilities in permanent safe shutdown state. The licensee shall maintain those facilities in permanent safe shutdown state according to the SWS plan for the facility. The SWS plans may also be combined with detailed decommissioning Plans (DDPs) when the decommissioning is taking place in several phases.

Facilities under Decommissioning

See LCH Section 11.2 for details regarding the decommissioning of individual facilities at WL.

Modifications to Facilities and Processes

The licensee shall ensure that modifications to WL facilities do not negatively impact safe operation of the facility. The licensee shall define the process for making permanent or temporary modifications to operational limits and conditions. Such modifications shall be justified by analyses and safety reviews.

The licensee may only modify facilities, buildings, structures, components or equipment in compliance with the licensing basis.

The licensee shall ensure that:

- a) all temporary modifications are identified at the point of application and at any relevant control positions;
- b) operating personnel are informed of any modifications and their consequences for facility operations;
- c) the temporary modifications are reviewed and approved before installation; the review shall be documented to demonstrate the scope and conclusion of the review;
- d) the number of simultaneous temporary modifications is kept to a minimum;
- e) the duration of temporary modifications is limited and specified prior to implementation;

SCA – OPERATING PERFORMANCE

- f) testing is performed after installation and removal of the temporary modification;
- g) temporary modifications are shown on affected documents; and
- h) the facility is returned to the original state when the temporary modification is no longer needed.

Sealed Sources

The licensee shall ensure the sealed sources are controlled (by maintaining an inventory of sealed sources, and tracking and reporting their transfer) in order to achieve the objectives stated in paragraph 5.(a) of section II of International Atomic Energy Agency's (IAEA) *Code of Conduct on the Safety and Security of Radioactive Sources*.

The inventory of sealed sources shall contain all sealed sources, both in use and in storage, of any category of sources as defined in Table 1 of the IAEA safety guide RS-G-1.9 *Categorization of Radioactive Sources*. The licensee shall provide details of their inventory at the CNSC staff's request.

Guidance:

None provided.

Licence Condition 3.2: Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble:

This licence condition sets the requirements for reporting information to CNSC, including compliance monitoring and operational performance, event reporting, and various types of notifications.

Many reportable occurrences included in REGDOC-3.1.2 do not necessarily show a degradation of licensee's performance, and do not fall under CNSC definition of a "reportable event" as included in REGDOC-3.6 Glossary of CNSC Terminology.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.1.2	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018	January 1, 2020

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-514300-MCP-006	CNL Reporting to Regulatory Agencies	5507946	N

SCA – OPERATING PERFORMANCE

Compliance Monitoring: Annual Reporting

The licensee shall by the following dates submit to the Commission or any person authorized by the Commission, the following reports covering the preceding calendar year as follows:

- a) By April 30th of each year:
 - i. the operation and maintenance of the following facilities: Concrete Canister Storage Facility, Shielded Facilities, Waste Management Area, Building 300 (Research and Development) and Building 402 (Health and Safety), summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
 - ii. the status of the WR-1 Reactor, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
 - iii. a summary of changes to non-nuclear facilities and structures;
 - iv. decommissioning activities associated with the following facilities: Concrete Canister Storage Facility, Shielded Facilities, Waste Management Area, Building 300 (Research and Development), Building 402 (Health and Safety) and WR-1 reactor, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and release of hazardous substances from the facilities;
 - v. changes to emergency authorities and organization, updates or changes to the radiation emergency procedures, status/changes in other program documentation, training activities, drill and exercise activities, status of emergency resources and facilities, interactions with outside agencies, and unplanned events in which the emergency response organization has been tested;
 - vi. the results of the effluent monitoring for nuclear substances, hazardous substances and personnel radiation exposures for WL.
- b) By June 30th of each year:
 - i. the results of environmental monitoring for nuclear and hazardous substances;
 - ii. the results and activities of the Environmental Assessment Follow-Up Program for Whiteshell Laboratories.
- c) If an action level has been reached as set out in LC 7.1 and 9.1, the licensee shall submit a final written report of the matter within 45 days of becoming aware of the matter.

Guidance:

Event Reporting

To encourage reporting of situations or events that may result in improvement actions, event reporting should not be used as a tool for assessing or measurement of nuclear safety, or as a basis for assessing the licensee's performance.

For low safety significance events where CNL has already provided a preliminary report verbally and where no significant additional information is likely to be determined from further investigation, CNL may elect to combine the submission of a written preliminary report with a written full report. CNSC staff may request additional information to be provided in order to achieve regulatory close out.

Compliance Monitoring: Annual Reporting

The annual reports should follow, where appropriate, the format and content presented in Appendix B of REGDOC-3.1.2.

SCA – SAFETY ANALYSIS

Licence Condition 4.1: Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

Preamble:

All event sequences which can occur in a nuclear facility must be analyzed to ensure safe operation. A deterministic safety analysis evaluates the facility's responses to such events by using predetermined rules and assumptions. The objectives of the deterministic safety analysis are stated in CSA N292.0.

The *General Nuclear Safety and Control Regulations* require that a licence application contain a description and the results of any analyses performed.

The *Class I Nuclear Facilities Regulations* require, amongst other requirements, that an application for a licence to operate a Class I nuclear facility contains a final safety analysis report, and additional supporting information.

The licensee holds the responsibility for ensuring that the safety analysis is accurate and meets the regulatory requirements, and shall maintain adequate capability to perform or procure safety analysis and to train safety analysts.

Compliance Verification Criteria:

Licensing Basis Publications

For compliance verification criteria for Safety Analysis refer to the CSA N292 series documents in LCH Section 11.1.

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508770-PDD-001	Program Description Document: Safety Analysis	5507946	N
900-508770-PRD-001	Program Requirements Document: Safety Analysis	5507946	Y
RC-983	Whiteshell Laboratories Concrete Canister Storage Facility Safety Analysis Report	5776580	Y ¹
WLSF-03500-SAR-001	Safety Analysis Report Whiteshell Laboratories Shielded Facilities	5776580	Y ¹
WLWMA-508640-SAR-001	Safety Analysis Report for the Whiteshell Laboratories Waste Management Area	5776580	Y ¹

¹ Notification is required only for non-administrative changes. If administrative changes are made, the licensee shall provide updated safety analyses to CNSC staff at the end of the next quarter.

SCA – SAFETY ANALYSIS

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC 2.4.4	Safety Analysis for Class IB Nuclear Facilities	2022
IAEA SSR-4	Safety of Nuclear Fuel Cycling Facilities	2017
IAEA TECDOC-1267	Procedures for Conducting Probabilistic Safety Assessment for Non-reactor Nuclear Facilities	2002
IAEA GSR Part 4, Rev. 1	Safety Assessment for Facilities and Activities	2016

Licence Condition 4.2: Nuclear Criticality Safety Program

The licensee shall implement and maintain a nuclear criticality safety program.

Preamble:

This licence condition requires the licensee to develop, implement and maintain a nuclear criticality safety program to ensure that the upper subcritical limits established in the criticality safety documents will not be exceeded under both normal and credible abnormal conditions (events or event sequences having the frequency of occurrence equal to or more than 10^{-6} /year) during operations with fissionable materials outside reactors.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC 2.4.3	Nuclear Criticality Safety, version 1.1	2020	June 3, 2021

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508550-PDD-001	Program Description Document: Nuclear Criticality Safety	5507946	N
900-508550-PRD-001	Program Requirements Document: Nuclear Criticality Safety	5507946	Y

For legacy activities or projects, the licensee may implement the requirements of the nuclear criticality safety on a graded approach, with appropriate criteria for categorization according to their safety significance. The legacy items are those nuclear criticality safety related activities and projects where work has begun prior to November 1, 2011.

SCA – SAFETY ANALYSIS

Guidance:

None provided.

SCA – PHYSICAL DESIGN

Licence Condition 5.1: Design Program

The licensee shall implement and maintain a design program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain a description of the structures, systems and components, and relevant documentation of the facility design.

A design program ensures that the facility design is managed using a well-defined systematic approach.

Implementing and maintaining a design program confirms that safety-related Structures, Systems, Components (SSC) and any modifications to them continue to meet their design bases given new information arising over time and taking changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility states. An important cross-cutting element of a design program is design basis management.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N393	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	2013 (2016)	January 1, 2020
	National Fire Code of Canada	2010	January 1, 2020
	National Fire Code of Canada	2015	TBD
	National Building Code of Canada	2010	January 1, 2020
	National Building Code of Canada	2015	TBD

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508120-PDD-001	Program Description Document: Design Authority and Design Engineering	5507946	N
900-508120-PRD-001	Program Requirements Document: Design Authority and Design Engineering	5507946	Y

SCA – PHYSICAL DESIGN

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC 2.5.1	General Design Considerations: Human Factors	2019

Licence Condition 5.2: Pressure Boundary Program

The licensee shall implement and maintain a pressure boundary program.

Preamble:

A pressure boundary program is comprised of the many programs, processes and procedures and associated controls that are required to ensure compliance with CSA standard N285.0, which defines the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination and inspection of pressure-retaining and containment systems, including their components and supports.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Revision	Effective Date
CSA N285.0	General requirements for pressure-retaining system and components in CANDU nuclear power plants	2008	January 1, 2020
CSA N285.0	General requirements for pressure-retaining system and components in CANDU nuclear power plants	2017	TBD
CSA B51	Boiler, Pressure Vessel and Pressure Piping Code	2014	

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508140-PDD-001	Program Description Document: Pressure Boundary	5507946	N
900-508140-PRD-001	Program Requirements Document: Pressure Boundary	5507946	Y
WLD-508140-PRO-001	Code Classification and Design Registration of Pressure – Retaining System/Components	5776580	Y
WL-508140-QAP-001	WL Pressure Boundary Quality Assurance Plan	5776580	N

SCA – PHYSICAL DESIGN

For the Whiteshell Laboratories, compliance with this licence condition will be assessed by the following;

- a) Subject to b) and c) below, the licensee shall design, manufacture, fabricate, procure, install, modify, repair, test, examine, inspect or otherwise perform work related to vessels, boilers, systems, piping, fittings, parts, components and supports according to the specifications in CSA standards N285.0-08, B51-14 or other codes and standards approved or prescribed by the Commission.

Where indicated by these standards, the licensee shall obtain the following regulatory approvals for this work:

- i. registered designs;
 - ii. accepted overpressure protection reports;
 - iii. approval of applicable standards and code classification;
 - iv. registered welding and brazing procedures;
 - v. qualified welders, welding operators, brazers and examination personnel;
 - vi. accepted quality assurance programs; and
 - vii. accepted plans and procedures (certificate(s) of authorization).
- b) CNL may classify as Class 6 systems or sections of systems that contain tritium or other radioactive substances, if the consequence of failure limit of 20 mSv effective acute whole body dose is not exceeded.
- c) CNL shall carry out the activities listed in a) above in accordance with B51-14, or other codes and standards approved or prescribed by the Commission, for pressure boundary systems and components that do not contain nuclear substances, do not adversely impact a nuclear safety system, or do not cause an unreasonable risk involving nuclear substances at WL.
- d) CNL shall operate vessels, boilers, systems, piping, fittings, parts, components, and supports safely and keep them in a safe condition. The licensee shall:
- i. follow accepted plans and procedures to test, maintain, or alter overpressure protection devices;
 - ii. comply with operating limits specified in certificates, orders, designs, overpressure protection reports, and applicable codes and standards;
 - iii. inspect and perform material surveillance according to accepted schedules, plans and procedures;
 - iv. have any certified boiler or vessel that is in operation or use inspected and certified by an authorized inspector according to an accepted schedule; and
 - v. ensure that vessels, boilers, systems, piping, fittings, parts, components and supports have markings, as specified in the applicable standards.

- e) CNL shall keep proper records of regulatory approvals and other documents required as set out in a) through d), and the standards applicable to the work or equipment.
- f) In addition to any reporting requirements of the *Nuclear Safety and Control Act* and its associated Regulations, CNL shall report promptly to the Commission and to the Manitoba Department of Labour and Immigration when the licensee learns of any failure of a pressure boundary that has caused injury, death or property damage.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N285.0.1	Commentary on CSA N285.0-12, General requirements for pressure-retaining systems and components in CANDU nuclear power plants	2016

SCA – FITNESS FOR SERVICE

Licence Condition 6.1: Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed measures, policies, methods and procedures to maintain the nuclear facility.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508230-PDD-001	Fitness for Service	5507946	N
900-508230-PRD-001	Fitness for Service	5507946	Y
WLD-106100-PLA-001	Periodic Inspection Plan for Whiteshell Laboratories Waste Management Area Concrete Bunkers	5776580	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.6.3	Aging Management	2014

SCA – RADIATION PROTECTION

Licence Condition 7.1: Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Radiation Protection Regulations* (RPR) requires that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried out. This program must ensure that doses to persons do not exceed prescribed dose limits and are kept as low as reasonably achievable (ALARA), social and economic factors being taken into account. Also, the program ensures that occupational exposures are ascertained and recorded in accordance with the *Radiation Protection Regulations* through the establishment of dosimetry requirements.

The regulatory dose limits to workers and the public are explicitly provided in the RPR. The RPR also specifies the requirements related to action levels (ALs) and indicate that the licence will be used to identify their notification timeframes. ALs relate to the parameters of dose to workers.

ALs are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required, as defined in the RPR and the licence. ALs are not intended to be static and are to reflect prevailing circumstances at the WL site.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508740-PDD-001	Program Description Document: Radiation Protection	5507946	N
900-508740-PRD-001	Program Requirements Document: Radiation Protection	5507946	Y
900-508740-MCP-006	Action Levels for Internal and External Exposures	5507946	Y
900-508740-MCP-007	Dose Control Points	5507946	N
900-508740-MCP-026	ALARA Review and Assessment - Planning and Control of Radiation Work	5507946	N
900-508740-STD-005	Design and Modification Considerations	5507946	N

SCA – RADIATION PROTECTION

Document Number	Document Title	e-Doc	Prior Notice
900-508740-STD-019	Radiation Levels and Limits	5507946	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC 2.7.1	Radiation Protection	2021
REGDOC 2.7.2	Dosimetry, Volume I: Ascertaining Occupational Dose	2021

The licensee should conduct a documented review and, if necessary, revise the ALs at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to CNSC staff.

SCA – CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1: Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed worker health and safety policies and procedures.

As a federal regulated site, WL is also subject to the requirements of *Canada Labour Code* and *Canada Occupational Health and Safety Regulations*.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-510400-PDD-001	Program Description Document: Occupational Safety and Health	5507946	N
900-510400-PRD-001	Program Requirements Document: Occupational Safety and Health	5507946	Y

Employment and Social Development Canada is mandated with overseeing and enforcing compliance with the *Canada Labour Code* and its regulations. CNSC staff monitor licensee compliance with its conventional health and safety program, and will take regulatory actions for any potential unsafe work practice situations.

Guidance:

None provided.

SCA – ENVIRONMENTAL PROTECTION

Licence Condition 9.1: Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information related to environmental protection. The *General Nuclear Safety and Control Regulations* requires every licensee to take all reasonable precautions to protect the environment. The *Radiation Protection Regulations* prescribe the radiation dose limits for the general public of 1 mSv per calendar year.

The *Radiation Protection Regulations* specify requirements related to “Action Levels” and indicate that the licence will be used to identify the action levels and the notification timeframes.

The release of hazardous substances is regulated by Environment and Climate Change Canada through various acts and regulations, as well as by the CNSC.

The environmental protection SCA includes the following:

- Effluent and emissions control (releases);
- Environmental management system (EMS);
- Assessment and monitoring;
- Protection of the public; and
- Environmental Risk Assessment.

Action levels (ALs) for environmental releases are calculated by the licensees and aim to alert licensees of a potential loss of control of their environmental protection program. By definition, if an action level is reached, a loss of control of some part of the associated environmental protection program may have occurred, and specific action is required. ALs are not intended to be static and are to reflect operating conditions at the WL site.

Compliance Verification Criteria:

The licensee will implement and maintain programs to ensure environmental protection as set out in licensing basis (LCH Section G.1).

CSA N286, included in LCH Section 1.1, defines other specific compliance verification criteria that support environmental protection.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.9.1	Environmental Principles, Assessments and Protection Measures, version 1.1	2017	January 1, 2020
N288.4	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	2010 (R2015)	January 1, 2020
N288.5	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	2011 (R2016)	January 1, 2020
N288.6	Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	2012 (R2017)	January 1, 2020
N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015 (R2020)	January 1, 2020
N288.8	Establishing and implementing action levels to control releases to the environment from nuclear facilities	2017 (R2022)	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-509200-PDD-001	Program Description Document: Environnemental Protection	5507946	N
900-509200-PRD-001	Program Requirements Document: Environnemental Protection	5507946	Y
WL-509200-STD-016	Administrative Levels and Action Levels for WL Air and Liquid Radioactive Effluents	5776580	Y
WL-509211-RRD-001	Derived Release Limits for CNL's Whiteshell Laboratories	5776580	Y
WL-509200-OV-001	Whiteshell Laboratories Integrated Monitoring Program Framework	5776580	N
WL-509200-PLA-001	WL Effluent Verification Monitoring Plan	5776580	Y
AECL Document No 03704 001	Environmental Assessment Follow up Program for Whiteshell Laboratories	5776580	Y

The licensee will implement all follow-up actions identified as a result of environmental assessments, and shall report the progress to CNSC staff on an annual basis.

SCA – ENVIRONMENTAL PROTECTION

The licensee will ensure effluent monitoring for nuclear and hazardous substances is designed, implemented and managed to respect applicable laws/regulation and to incorporate best practices. The effluent monitoring program will provide for control of airborne and waterborne effluents. The licensee will control, monitor and record releases of radioactive and/or hazardous substances such that the releases do not exceed the reference levels (limits).

The licensee will establish the DRLs in accordance with CSA N288.1. The dose to the critical group due to the sum of all radioactive releases shall not exceed 1 mSv.

The licensee will conduct an updated site-wide environmental risk assessment (ERA) in accordance with the CSA Standard N288.6-12 *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills* taking into account current conditions at the WL site.

The licensee will control radiological releases to ALARA, within the DRLs, and take action to investigate and correct the cause(s) of increased releases should they occur. The licensee shall report the releases in accordance with LCH Section 3.2.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N288.1	Guidelines for calculating derived release limits for radioactive material in airborne and liquid effluents for normal operation of nuclear facilities	2014 (Update 3)
CSA N288.2	Guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents	2014

SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1: Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

Preamble:

This licence condition requires the licensee to establish an emergency preparedness program to prepare for, to respond to, and to recover from the effects of accidental radiological/nuclear and/or hazardous substance release. As part of the emergency preparedness program, the licensee establishes an onsite emergency response plan and an emergency response organization and makes arrangements for coordinating off-site activities and cooperating with external response organizations throughout all phases of an emergency.

The Class I *Nuclear* Facilities Regulations requires measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to assist, notify, report to off-site authorities including the testing of the implementation of these measures.

A security response to malevolent acts is governed by a separate plan under the Nuclear Security program (see LCH Section 12.1) but provisions of the licensee site security report apply to any associated potential threat of release of radioactive material - for example, the need for off-site notification, situation updates and confirmation of any radioactive releases.

Liquid release response and radioactive materials transportation emergency response plan are also governed by separate plans (See LCH Sections 9.1 and 14.1, respectively).

WL has a communication program that covers a broad spectrum – community interface meetings, newsletters, websites, committees and various panels.

WL provides the local municipalities and the province (as required, federal) with hazard information that can be used for community communications during an emergency.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	Jan 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508730-PDD-001	Program Description Document: Emergency Preparedness	5507946	N
900-508730-PRD-001	Program Requirements Document: Emergency Preparedness	5507946	Y
WL-508730-ERP-001	Whiteshell Laboratories Emergency Response Plan	5776580	N

REGDOC-2.10.1 shall be applied to WL as a whole, not to individual facilities on site.
Requirements for reactor facilities with a thermal capacity greater than 10MW are not applicable.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N1600	General requirements for nuclear emergency management programs	2016
	<i>Canadian Guidelines for Intervention During a Nuclear Emergency</i>	2003
	<i>Canadian Guidelines for the Restriction of Radioactively Contaminated Food and Water Following a Nuclear Emergency</i>	2000

Licence Condition 10.2: Fire Protection Program

The licensee shall implement and maintain a fire protection program.

Preamble:

Licensees require a comprehensive fire protection program to ensure the licensed activities do not result in unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Fire protection provisions, including response, are required for the design, construction, commissioning, operation, and decommissioning of nuclear facilities, including structures, systems, and components (SSCs) that directly support the plant and the protected area. External events such as an aircraft crash or security threats are addressed in LCH Section 12.1.

The *National Fire Code of Canada* sets out technical provisions regulating (a) activities related to the construction, use or demolition of buildings and facilities; (b) the condition of specific elements of buildings and facilities; (c) the design or construction of specific elements of facilities related to certain hazards; and (d) protection measures for the current or intended use of buildings.

The *National Building Code of Canada* sets out technical provisions for the design and construction of new buildings. It also applies to the alteration, change of use and demolition of existing buildings.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2016)	Jan 1, 2020
	<i>National Fire Code of Canada</i>	2010	Jan 1, 2020
	<i>National Fire Code of Canada</i>	2015	TBD
	<i>National Building Code of Canada</i>	2010	Jan 1, 2020
	<i>National Building Code of Canada</i>	2015	TBD

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508720-PDD-001	Program Description Document: Fire Protection	5507946	N
900-508720-PRD-001	Program Requirements Document: Fire Protection	5507946	Y
900-508720-MCP-006	Impairment, Notification and Compensatory Measures	5507946	N

Where CSA standard N393 requires items to be submitted to CNSC for review and/or acceptance, the licensee shall document the item in sufficient detail to ensure it is safe to proceed. The licensee may implement that item without prior review and/or acceptance from CNSC staff. Changes of use or modifications for which the fire screening assessment indicates no potential impact on fire protection design basis, goals or criteria may not be subject to any further third-party review or require submission to the CNSC.

The licensee shall submit the results of third-party reviews required by CSA N393 (review of modifications, review of performance-based design or operation, fire protection program audit, and evaluation of fire response capability). The results of these reviews shall be submitted to CNSC staff no later than six months after the review together with any corrective action plans with compensatory measures for identified non-compliances.

SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Fire Response

In accordance with N393, the licensee shall arrange for third party audits of the fire response capability at the frequencies stated in N393. The purpose of a Third Party Audit is to provide an in-depth analysis of the Industrial Fire Brigade (IFB) fire response performance against applicable regulatory criteria. A fire response is a planned, coordinated and controlled activity to provide emergency response to a fire. The audit is to analyze and ensure competencies of the IFB against CSA N393 standard and the referred NFPA 600 and 1081 standards.

An independent third party auditor is required to be an expert in the discipline, normally firefighting and qualified through specific education and relevant experience. The third party auditor is required to be independent or at “arm’s length” from the facility to ensure impartiality. The review shall be of sufficient depth and detail to allow the reviewer to attest with reasonable confidence on the competencies of the IFB at the facility.

Guidance:

Where CSA N393 does not address a fire protection topic or issue in whole, or where additional guidance is beneficial, the standards and recommended practices set out by the NFPA are used as guidance by CNSC staff in determining the adequacy of a fire protection measure. The results of the Third Party Audit report will typically consist of a report which compares the requirements of the applicable codes and standards against the implementation of the fire protection program or the Fire Response exercised (based on the scope of the audit). The report should identify any non-compliance and formulate a conclusion on whether the licensee fire protection program or IFB meets the requirements of N393.

SCA – WASTE MANAGEMENT

Licence Condition 11.1: Waste Management Program

The licensee shall implement and maintain a waste management program.

Preamble:

The scope of this licence condition covers internal waste-related programs that form part of the WL operations. Topics include waste management, waste characterization, waste minimization and waste management practices.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.11.1	Waste Management, Volume I: Management of Radioactive Waste	2021	March 31, 2022
REGDOC-2.11.1	Waste Management Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	2021	March 31, 2022
CSA N292.0	General principles for the management of radioactive waste and irradiated fuel	2019	March 31, 2022
CSA N292.2	Interim dry storage of irradiated fuel	2013 (R2018)	January 1, 2020
CSA N292.3	Management of low- and intermediate-level radioactive waste	2014	January 1, 2020
CSA N292.6	Long-term management of radioactive waste and irradiated fuel	2018	March 31, 2022

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508600-PDD-001	Program Description Document: Waste Management	5507946	N
900-508600-PRD-001	Program Requirements Document: Waste Management	5507946	Y
CW-508600-PLA-002	Plan: Canadian Nuclear Laboratories Integrated Waste Strategy	5507946	N

The licensee shall not produce, in the course of the licensed activities, or accept from outside clients, waste for which there is no identified treatment, or storage, or disposal facility.

SCA – WASTE MANAGEMENT

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.11	REGDOC-2.11, Framework for Radioactive Waste Management and Decommissioning in Canada, Version 2	2021
CSA N292.5	Guideline for the exemption or clearance from regulatory control of materials that contain, or potentially contain, nuclear substances	2011 (R2021)

Licence Condition 11.2: Decommissioning Plan

The licensee shall maintain a decommissioning plan.

Preamble:

Class I Nuclear Facilities Regulations requires that a licence application contain the proposed plan for decommissioning of the nuclear facility or of the site. The decommissioning plan for WL site is documented in the *Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview* and the associated cost estimate.

Whiteshell Laboratories is undergoing decommissioning in a staged manner. Consequently, it is noted that not all volumes of the detailed decommissioning plan have been developed, as they are developed when so required by CNL. For volumes not yet developed, decommissioning activities cannot proceed without CNSC concurrence.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.11.2	Decommissioning	2021	March 31, 2025
CSA N294	Decommissioning of facilities containing nuclear substances	2009 (R2014)	January 1, 2020
CSA N294	Decommissioning of facilities containing nuclear substances	2019	March 31, 2025

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508300-PDD-001	Cleanup	5507946	N
900-508300-PRD-001	Cleanup	5507946	Y
RC-1291-R1	The Monitoring and Surveillance Plan for the WR-1 Deferment Period	5776580	Y
WLDP-02000-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview	5776580	Y ¹
WLDP-02000-DDP-001 AD	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview – Addendum	5776580	Y ¹
WLDP-21400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 2 - Shielded Facilities	5776580	Y ¹
WLDP-26400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 6 – Whiteshell Reactor #1: Building 100	5776580	Y ¹
WLDP-22500-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 7 – Concrete Canister Storage Facilities (CCFS)	5776580	Y ¹
	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 1 - Standpipes		Y ¹
	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 2 – ILW Bunkers, B417, Amine Tanks		Y ¹
WLDP-24400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 3 – Operational Structures, LLW Liabilities and WMA Grounds	5776580	Y ¹
WLDP-23500-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 9 – Building 300	5776580	Y ¹

SCA – WASTE MANAGEMENT

Document Number	Document Title	e-Doc	Prior Notice
WLDP-23500-DDP-001 AD	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 9 – Building 300 - Addendum	5776580	Y ¹
WLDP-37000-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan: Volume 11 Health and Safety Buildings 402 and 305	5776580	Y ¹
RC-2143-12 Part 1	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 1: South-Side Buildings	5776580	Y ¹
WLDP-32000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 2: North-Side Buildings	5776580	Y ¹
WLDP-33000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 3: Outer-Area Building and Facilities	5776580	Y ¹
WLDP-34000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 4: Site Services	5776580	Y ¹
WLDP-35000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 5: Site Affected Lands and Contaminated Structures	5776580	Y ¹

¹ DDPs are to be reviewed and accepted by the CNSC in accordance with the requirements in CSA N294.

Note: The Whiteshell Laboratories Detailed Decommissioning Plan - Volume 3: Van de Graaff Accelerator, the Whiteshell Laboratories Detailed Decommissioning Plan - Volume 4: Neutron Generator, Whiteshell Laboratories Detailed Decommissioning Plan – Volume 5 – Active Liquid Waste Treatment Centre Building 200 and the Whiteshell Laboratories Detailed Decommissioning Plan - Volume 10: Decontamination Centre Building 411 have been completely decommissioned and are therefore not listed in the above table.

Facilities under Decommissioning

The licensee shall conduct decommissioning activities in accordance with Volumes 1 to 12 of the Whiteshell Laboratories Detailed Decommissioning Plan. Decommissioning plans are reviewed by CNSC staff and decommissioning activities cannot proceed without CNSC concurrence.

Guidance:

None provided.

SCA – SECURITY

Licence Condition 12.1: Security Program

The licensee shall implement and maintain a security program.

Preamble:

The *General Nuclear Safety and Control Regulations* require that a licence application contain information related to site access control and measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information.

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility.

The *Nuclear Security Regulations* require that a licence application contain specific information related to nuclear security, stipulates the requirements for high-security sites, and contains specific requirements pertaining to the transportation of Category I, II or III nuclear material.

The *Nuclear Security Regulations* require that a licensee of a high security site:

- maintain at all times a qualified onsite nuclear response force;
- obtain the applicable certifications, before issuing an authorization to a nuclear security officer;
- prevent and detect unauthorized entry into a protected area or inner area; and
- prevent unauthorized entry of weapons and explosive substances into a protected area or inner area.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.12.1 (prescribed information)	High-Security Sites, Volume I: Nuclear Response Force, Version 2	2018	January 1, 2020
REGDOC-2.12.1 (prescribed information)	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	2018	January 1, 2020
REGDOC-2.12.2	Site Access Security Clearance	2013	January 1, 2020
REGDOC-2.12.3	Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	2020	June 3, 2021

Document Number	Document Title	Version	Effective Date
CSA N290.7	Cyber-security for nuclear power plants and small reactor facilities	2014 (R2021)	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508710-PDD-001	Program Description Document: Security	5507946	N
900-508710-PRD-001	Program Requirements Document: Security	5507946	Y
900-511400-PDD-001	Program Description Document: Cyber Security	5507946	N
900-511400-PRD-001	Program Requirements Document: Cyber Security	5507946	Y
EPS-14000-RPT-18 (prescribed information)	Site Security Report	5776580	Y

The CSA standard N290.7 covers the cyber security of new and existing nuclear power plants (NPPs) and small reactor facilities.

The CNL document EPS-14000-RPT-18 *Site Security Report* document is required to be updated periodically and resubmitted to the CNSC staff. The site security report shall be updated and resubmitted when there are significant changes to the program.

Guidance:

Guidance Documents

Document Number	Document Title	Version
G-208	Transportation Security Plans for Category I, II or III Nuclear Material	2003
G-274	Security Programs for Category I or II Nuclear Material or Certain Nuclear Facilities	2003

Licence Condition 12.2: Security Arrangements

The licensee shall complete the implementation of all security arrangements as outlined in the corrective action plan: Implementation Plan: Tiered Response Force (TRF) 119-508710-PLA-010, no later than May 1, 2020

Preamble:

This licence condition requires the licensee to create, train, equip and maintain a Tiered Response Force (TRF) capable of countering the Design Basis Threat (DBT).

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
119-508710-PLA-010 (prescribed information)	Implementation Plan: Tiered Response Force (TRF)	N/A	Y

Guidance:

None provided.

SCA – SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1: Safeguards Program

The licensee shall implement and maintain a safeguards program.

Preamble:

Safeguards is a system of inspection and other verification activities undertaken by the IAEA in order to evaluate a Member State's compliance with its obligations pursuant to its safeguards agreements with the IAEA.

The *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement.

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information on the licensee's proposed measures to facilitate Canada's compliance with any applicable safeguards agreement.

Canada has entered into a safeguards agreement with the IAEA pursuant to its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. The objective of the Canada/IAEA Safeguards Agreement is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities. This conclusion confirms that Canada is in compliance with its obligations under the following Canada/IAEA Safeguards Agreement:

- [*Treaty on the Non-Proliferation of Nuclear Weapons*](#);
- [*Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#); and
- [*Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons*](#).

These are reproduced in information circulars INFCIRC/140, INFCIRC/164, and INFCIRC/164/Add. 1.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	January 1, 2020

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508510-PDD-001	Program Description Document: Nuclear Materials and Safeguards Management	5507946	N
900-508510-PRD-001	Program Requirements Document: Nuclear Materials and Safeguards Management	5507946	Y

The licensee shall obtain prior written approval of the CNSC, for any changes to operation, equipment or procedures requested by the licensee that would affect the implementation of safeguards measures.

Guidance:

None Provided.

SCA – PACKAGING AND TRANSPORT

Licence Condition 14.1: Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain information on the proposed procedures for transporting nuclear substances and hazardous substances.

The transport of nuclear substances or hazardous substances must be done in accordance with the requirements of the *Packaging and Transport of Nuclear Substances Regulations, 2015*, (PTNSR) and *Transportation of Dangerous Goods Regulations* (TDGR) set out by Transport Canada.

IAEA document SSR-6 *Regulations for the Safe Transport of Radioactive Material (2018 Edition)* is incorporated by reference in PTNSR. These Regulations establish standards of safety which provide an acceptable level of control of the radiation, criticality and thermal hazards to persons, property and the environment that are associated with the transport of radioactive material.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
IAEA SSR-6	Regulations for the Safe Transport of Radioactive Material (2018 Edition)	2018	January 1, 2020

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508520-PDD-001	Program Description Document: Transportation of Dangerous Goods	5507946	N
900-508520-PRD-001	Program Requirements Document: Transportation of Dangerous Goods	5507946	Y

The licensee shall implement and maintain a packaging and transport program that will be in compliance with all the regulatory requirements set out in the Transport Canada TDGR and in the CNSC PTNSR.

Shipments of nuclear substances within the WL site where access to the property is controlled are exempted from the application of the PTNSR.

PACKAGING AND TRANSPORT

Based on the current versions of the PTNSR and TDGR, for the packaging and transport of nuclear substances:

- a) to and from the WL site, both PTNSR and TDGR apply.
- b) between the WL facilities:
 - i. according to paragraph 2(2)(d) of the PTNSR, the PTNSR do not apply to the transport of nuclear substances within the WL site, except for sections 6 and 7. Sections 6 and 7 refer to the CNSC *Nuclear Security Regulations*, specifically to the transport of Category I, II or III nuclear material.
 - ii. TDGR do not apply per subsection 1.25 of those regulations.

Guidance:

Guidance Documents

Document Number	Document Title	Version
RD-364	Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages	2009
REGDOC-2.14.1	Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015	2016

APPENDIX A: DEFINITIONS AND ACRONYMS

1. DEFINITIONS

The following is a list of definitions of words or expressions used in the LCH that may need clarification; they are defined for the purpose of the LCH only. All other terms and expressions used in the LCH are consistent with the definitions provided in the NSCA, the regulations made pursuant to the NSCA, or in the CNSC regulatory document REGDOC-3.6 *Glossary of CNSC Terminology*.

Approval – Commission’s permission to proceed, for situations or changes where the licensee would be:

- not compliant with regulatory requirements set out in applicable laws and regulations;
- not compliant with a licence condition; and
- not in the safe direction but the objective of the licensing basis is met.

Boundary Conditions – procedural, administrative rules and operating limits for ensuring safe operation of the facility based on safety analyses and any applicable regulatory requirements.

Compliance Verification Criteria – regulatory criteria used by CNSC staff to verify compliance with the licence conditions.

Design Basis – the entire range of conditions for which the nuclear facility is designed, in accordance with established design criteria, and for which damage to the fuel and/or the release of radioactive material is kept within authorized limits.

Effective Date – the date that a given document becomes effective within the licensing period. The effective date is either set to the licence issue date or to a future date when the given document becomes effective.

Guidance – guidance in the LCH is non-mandatory information, including direction, on how to comply with the licence condition.

Program(s) – a documented group of planned activities, procedures, processes, standards and instructions coordinated to meet a specific purpose.

Qualified Staff – trained licensee staff, deemed competent and qualified to carry out tasks associated with their respective positions.

Safe Direction – changes in facility safety levels that would not result in:

- a. a reduction in safety margins;
- b. a breakdown of barrier;
- c. an increase (in certain parameters) above accepted limits;
- d. an increase in risk;
- e. impairment(s) of safety systems;
- f. an increase in the risk of radioactive releases or spills of hazardous substances;
- g. injuries to workers or members of the public;
- h. introduction of a new hazard;
- i. reduction of the defence-in-depth provisions;

- j. reducing the capability to control, cool and contain the reactor while retaining the adequacy thereof; or
- k. causing hazards or risks different in nature or greater in probability or magnitude than those stated in the safety analysis of the nuclear facility.

Safety and Control Measures – measures or provisions which demonstrate that the applicant:

- a. is qualified to carry on the licensed activities; and
- b. has made adequate provision for the protection of the environment, the health and safety of persons, the maintenance of national security and any measures required to implement international obligations to which Canada has agreed.

Written Notification – a physical or electronic communication between CNSC staff and a person authorized to act on behalf of the licensee.

2. ACRONYMS LIST

Acronym	Definition
AECL	Atomic Energy of Canada Limited
AL	Action Level
ALARA	As Low As Reasonably Achievable
CAF	Change Approval Form
CEAA	Canadian Environmental Assessment Act
CNEA	Canadian National Energy Alliance
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
CVC	Compliance Verification Criteria
DDP	Detailed Decommissioning Plan
DRL	Derived Release Limit
EMS	Environmental Management System
ERA	Environmental Risk Assessment
GDI	Governing Document Indices
IAEA	International Atomic Energy Agency
IFB	Industrial Fire Brigade
LCH	Licence Conditions Handbook
NSCA	Nuclear Safety and Control Act
PDD	Program Description Document
PRD	Program Requirements Document
PTNSR	Packaging and Transport of Nuclear Substances Regulations, 2015
REGDOC	Regulatory Document
RPR	<i>Radiation Protection Regulations</i>
SSC	Structures, Systems, Components
SWS	Storage with Surveillance
TDGR	Transportation of Dangerous Goods Regulations
TRF	Tiered Response Force
WL	Whiteshell Laboratories

APPENDIX A: DEFINITIONS AND ACRONYMS

Proposed Licence Changes

Overview

There are no changes to the activities and the format of the proposed licence and the recommended licence term is for a 3-year period. There are changes to the licence conditions and CNSC staff recommend a new licence condition under the Management System licence condition for CNL to provide additional reporting on its integrated assessment plan for the WL site.

Licence Conditions

Proposed changes to the CNL WL licence and licence conditions handbook are as follows:

1. SCA – Management System

Proposed Licence Conditions, in Proposed Licence

Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements

“The licensee shall submit to the Commission or any person authorized by the Commission, reports covering the progress of the licensee’s integrated assessment plan at Whiteshell Laboratories.”

Current WL Licence Conditions

Licence condition 1.2 does not exist in the current licence.

Discussion

CNSC staff recommend an additional licence condition proposed for the SCA, which aims to ensure that CNL is held accountable for its performance and drives improvement with increased regulatory scrutiny from the CNSC staff. Proposed licence condition 1.2 requires CNL to submit an annual report detailing the implementation of its integrated assessment plan (IAP) for the WL. Further context can be found in subsection 4.1.3.3 of this CMD.

2. SCA – Operating Performance

Proposed Licence Conditions, in Proposed Licence

Licence Condition 3.1: Operating Performance

Sealed Sources

“Unless otherwise permitted by the prior approval of the CNSC, the licensee shall, in respect of a radioactive nuclear substance set out in column 1 of table 3-1, report in writing to the CNSC staff any transfer or receipt of a sealed source whose corresponding activity is equal to or greater than the value set out in column 2 of the table.

- (a) at least seven business days before any transfer, and
 - (b) within two business days of any receipt of a transfer.
- ...”

The full text can be found in the attached proposed licence conditions handbook.

Current WL Licence Conditions

The current licence conditions handbook does not provide clarification on the requirements for written reporting to CNSC staff of any transfer or receipt of a sealed source with an activity equal to or greater than the values provided in a table.

Discussion

The proposed additional text under licence condition 3.1 provides clarification and written reports to CNSC staff of sealed source transfers and receipts. This requirement is part of a standardization of licence conditions handbooks for CNL sites.

3. SCA – Operating Performance

Proposed Licence Conditions, in Proposed Licence

Licence Condition 3.2: Reporting Requirements

Compliance Monitoring: Annual Reporting

“The licensee shall by the following dates submit to the Commission or any person authorized by the Commission, the following reports covering the preceding calendar year as follows:

- b) By April 30th of each year:
 - i. an integrated assessment plan monitoring report as detailed in Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements.”

Current WL Licence Conditions

An annual reporting requirement for an integrated assessment plan does not exist in the current licence.

Discussion

CNSC staff recommend adding an additional compliance monitoring annual report under licence condition 3.2: reporting requirements to align with the new proposed licence condition 1.2 under the Management System SCA for an integrated assessment plan report.

4. SCA – Safety Analysis

Proposed Licence Conditions, in Proposed Licence

Licence Condition 4.1: Safety Analysis Program

“Every 5 years, the licensee shall review and revise, if necessary, the safety analysis report for facilities to confirm that the document accurately captures the condition of the facility and that the radiological consequences of accident scenarios do not exceed public dose limits. The safety analysis report review shall be submitted to CNSC staff.”

Current WL Licence Conditions

There is no requirement within the current licence for CNL to review and revise facility safety analysis reports.

Discussion

The requirement to revise and review facility SARs is in REGDOC-2.4.4, *Safety Analysis for Class IB Nuclear Facilities*, however CNL plans to be compliant to this REGDOC by 2027. CNSC staff recommend adding this is a requirement to licence condition 4.1 for CNL to begin revising its dated SARs ahead of its planned compliance with REGDOC-2.4.4.

5. SCA – Safety Analysis

Proposed Licence Conditions, in Proposed Licence

Licence Condition 4.2: Nuclear Criticality Safety Program

The addition of CNL WL facility criticality safety documents (CSD) as licensee documents that require notification of change.

Current WL Licence Conditions

CNL WL facility criticality safety documents are not required to be licensee documents that require notification of change requirement within the current licence, specifically under licence condition 4.2.

Discussion

Notification of change of CSDs is implicitly required under licence condition 3.1: Operating Program through facility authorization documents, which are licensee documents requiring notification of change. However, this is an opportunity for improvement to explicitly list CSDs as documents requiring notification of change under licence condition 4.2 for clarity.

6. SCA – Emergency Management and Fire Protection

Proposed Licence Conditions, in Proposed Licence

Licence Condition 10.2: Fire Protection Program

“As required by CSA standard N393, fire protection assessments shall be prepared for nuclear facilities and shall include Code Compliance Review (CCR) and Fire Hazard Assessment (FHA). The results of the CCR and FHA shall be documented and submitted

to CNSC for acceptance. The CCR and FHA shall be maintained as necessary to reflect nuclear facility modifications, significant changes in fire hazards, operating experience, and operational changes, and shall be updated or confirmed at least once every 5 years.

“Fire Response

As required by CSA N393, a review of the Facility Fire Brigade (FFB) governance and performance shall be included in the FPP audit described above. The FPP audit shall include direct observation and assessment of at least 1 FFB fire response drill. The FFB drill assessment is to analyze and ensure competencies of the IFB against the CSA N393 standard and the National Fire Protection Association (NFPA) standards.”

Current WL Licence Conditions

Licence Condition 10.2: Fire Protection Program

“Where CSA standard N393 requires items to be submitted to CNSC for review and/or acceptance, the licensee shall document the item in sufficient detail to ensure it is safe to proceed. The licensee may implement that item without prior review and/or acceptance from CNSC staff. Changes of use or modifications for which the fire screening assessment indicates no potential impact on fire protection design basis, goals or criteria may not be subject to any further third-party review or require submission to the CNSC.”

“Fire Response

In accordance with N393, the licensee shall arrange for third party audits of the fire response capability at the frequencies stated in N393. The purpose of a Third Party Audit is to provide an in-depth analysis of the Industrial Fire Brigade (IFB) fire response performance against applicable regulatory criteria. A fire response is a planned, coordinated and controlled activity to provide emergency response to a fire. The audit is to analyze and ensure competencies of the IFB against CSA N393 standard and the referred NFPA 600 and 1081 standards.”

Discussion

CNSC staff are proposing to add CNL WL FPA documents, which include FHAs and CCRs, and CNL’s Whiteshell Staffing, Equipment and Apparatus document as licensee notification of change documents to licence condition 10.2 that require CNSC staff approval before implementation. The proposed updated licence conditions align with other licence conditions as to the level of detail of prescribing regulatory requirements to the licensee.

7. SCA – Security

Proposed Licence Conditions, in Proposed Licence

Removal of licence condition 12.2: Security Arrangements and relocating WL Tiered Response Force (TRF) implementation plan from licence condition 12.2 to licence condition 12.1: Security Program as a notification of change document.

Current WL Licence Conditions

Licence Condition 12.2: Security Arrangements

“The licensee shall complete the implementation of all security arrangements as outlined in the corrective action plan: Implementation Plan: Tiered Response Force (TRF) 119-508710-PLA-010, no later than May 1, 2020.”

Discussion

CNSC staff are proposing to remove licence condition 12.2 for the proposed licence. CNL has satisfactorily implemented the corrective actions from the Tiered Response Force (TRF) implementation plan at WL to meet a Satisfactory rating in 2022 and 2023. However, CNSC staff proposed the TRF implementation plan to be added as a notification of change document under licence condition 12.1: Security Program where “The licensee shall implement and maintain a security program.”. The plan would require prior approval from CNSC staff before the implementation of any revisions to the plan.

Licence Format

No change.

Licence Period

CNSC staff are recommending a 3-year licence period. This is also the period CNL requested to allow the appropriate amount of time to focus on implementing corrective actions and improvements to all SCA programs at the WL site.

CNL will undergo a new Government Owned Contractor Operated contract model in 2025. With increased regulatory scrutiny, CNSC staff will be monitoring the transition period for CNL and its resulting performance with new executive management before allowing a longer licensing period.

The WL decommissioning licence will be up for renewal at the end of the proposed 3-year decommissioning licence period, whereby the Commission can review CNL's performance and progress on the SCA programs at the WL site in addition to CNSC staff's RORs.

Proposed Licence

e-Doc 7189295 (Word)

e-Doc 7324420 (PDF)



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NRTEDL-W5-8.00/2027

I) LICENCE NUMBER NRTEDL-W5-8.00/2027

II) LICENSEE Pursuant to subsection 24(2) of the *Nuclear Safety and Control Act*, this licence is issued to:

Canadian Nuclear Laboratories Ltd.
Laboratoires Nucléaires Canadiens Ltée
286 Plant Road
Chalk River, Ontario
K0J 1J0

III) LICENCE PERIOD

This licence is valid from: January 1, 2025 to December 31, 2027 unless otherwise suspended in whole or in part, amended, revoked, or replaced.

IV) LICENSED ACTIVITIES

In accordance with section 26 of the *Nuclear Safety and Control Act*, this licence authorizes the licensee to:

- a) operate and decommission the WL located in Pinawa, Province of Manitoba as further described in the WL LCH,
- b) produce, possess, process, refine, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),
- c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
- d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a),



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-
- e) carry out the site preparation, construction or construction modification or undertaking that is required for, associated with or arise from the activities described in a).

V) CONDITIONS

G GENERAL

G.1 The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

- (i) the regulatory requirements set out in the applicable laws and regulations;
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

G.1 The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

G.2 The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.3 The licensee shall implement and maintain a public information and disclosure program.

1 MANAGEMENT SYSTEM

1.1 The licensee shall implement and maintain a management system.

1.2 The licensee shall submit to the Commission or any person authorized by the Commission, reports covering the progress of the licensee's integrated assessment plan at Whiteshell Laboratories.



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2 HUMAN PERFORMANCE MANAGEMENT

- 2.1 The licensee shall implement and maintain a human performance program.
- 2.2 The licensee shall implement and maintain a training program.

3 OPERATING PERFORMANCE

- 3.1 The licensee shall implement and maintain an operating program, which includes a set of operating limits.
- 3.2 The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

4 SAFETY ANALYSIS

- 4.1 The licensee shall implement and maintain a safety analysis program.
- 4.2 The licensee shall implement and maintain a nuclear criticality safety program.

5 PHYSICAL DESIGN

- 5.1 The licensee shall implement and maintain a design program.
- 5.2 The licensee shall implement and maintain a pressure boundary program.

6 FITNESS FOR SERVICE

- 6.1 The licensee shall implement and maintain a fitness for service program.

7 RADIATION PROTECTION

- 7.1 The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

8 CONVENTIONAL HEALTH AND SAFETY

- 8.1 The licensee shall implement and maintain a conventional health and safety program.



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9 ENVIRONMENTAL PROTECTION

- 9.1 The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

10 EMERGENCY MANAGEMENT AND FIRE PROTECTION

- 10.1 The licensee shall implement and maintain an emergency preparedness program.
- 10.2 The licensee shall implement and maintain a fire protection program.

11 WASTE MANAGEMENT

- 11.1 The licensee shall implement and maintain a waste management program.
- 11.2 The licensee shall maintain a decommissioning plan.

12 SECURITY

- 12.1 The licensee shall implement and maintain a security program.

13 SAFEGUARDS AND NON-PROLIFERATION

- 13.1 The licensee shall implement and maintain a safeguards program.

14 PACKAGING AND TRANSPORT

- 14.1 The licensee shall implement and maintain a packaging and transport program.

VI) EXPLANATORY NOTES

- i) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.
- ii) Unless otherwise provided for in this licence, words and expressions used in this licence have the same meaning as in the Nuclear Safety and Control Act and associated Regulations.



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-
- iii) The Whiteshell Laboratories Licence Conditions Handbook (LCH) provides compliance verification criteria used to verify compliance with the conditions set out in this licence, including information regarding delegation of authority and applicable versions of documents and a process for version control of codes, standards or other documents that are used as compliance verification criteria.

SIGNED at [city where signed] on [date signed]

X

President, Canadian Nuclear Safety Commiss...

Draft Licence Conditions Handbook

e-Doc 7189311 (Word)

e-Doc 7324457 (PDF)



e-Doc 7189311 (WORD)

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LICENCE CONDITIONS HANDBOOK

NRTEDL-LCH-8.00/2027

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LICENCE**

NRTEDL-W5-8.00/2027

Revision 0

DRAFT



Licence Conditions Handbook
NRTEDL-LCH-08.00/2027, Revision 0
Whiteshell Laboratories
Nuclear Research and Test
Establishment Decommissioning
Licence
NRTEDL-W5-8.00/2027

Effective: January 1, 2025

SIGNED at OTTAWA this ____ day of Month, year

Kimberley Campbell, Director

Canadian Nuclear Laboratories Regulatory Program Division
Directorate of Nuclear Cycle and Facilities Regulations
CANADIAN NUCLEAR SAFETY COMMISSION

Revision History:

Effective Date	Rev. #	e-Doc #	Description	CAF e-Doc #
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INTRODUCTION

The general purpose of the Licence Conditions Handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition. This will help ensure that the licensee performs the licensed activities at the Whiteshell Laboratories (WL) in accordance with the licensing basis for WL and the intent of the WL licence. The LCH should be read in conjunction with the licence.

The LCH typically has three parts under each licence condition: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains, as needed, the regulatory context, background, and/or history related to the licence condition. CVC are criteria used by Canadian Nuclear Safety Commission (CNSC) staff to verify and oversee compliance with the licence condition. Guidance is non-mandatory information, including direction, on how to comply with the licence condition.

The documents referenced in the LCH by e-Access number are not publicly available. The links provided in the LCH are referenced to the internal CNSC electronic filing system, and those documents cannot be opened from outside of the CNSC network.

Current versions of the licensing basis publications, licensee documents that require notification of change, and guidance documents referenced in the LCH are tracked in the document *Licensing Documents for Whiteshell Laboratories-WL-Specific* (e-Doc [5776580](#)) and *Company-Wide* (e-Doc [5507946](#)), which are controlled by the Canadian Nuclear Laboratories Regulatory Program Division and are available to the licensee upon request.

Most CNSC documents referenced in the LCH are available through the CNSC public website. Documents listed on the CNSC website may contain prescribed information as defined by the *General Nuclear Safety and Control Regulations*. Information in these documents will be made available only to stakeholders with appropriate security clearance on a valid need to know basis.

The licensee documents referenced in the LCH are not publicly available; they contain proprietary information or prescribed information as defined by the *General Nuclear Safety and Control Regulations*.

Domestic and international standards (in particular consensus standards produced by the Canadian Standards Association (CSA) Group) are an important component of the CNSC's regulatory framework. Standards support the regulatory requirements established through the *Nuclear Safety and Control Act* (NSCA), its regulations and licences by setting out the necessary elements for acceptable design and performance at a regulated facility or regulated activity. Standards are one of the tools used by the CNSC to evaluate whether licensees are qualified to carry out licensed activities.

The CNSC offers complimentary access to the CSA Group [suite of nuclear standards](#) through the CNSC website. This access platform allows interested stakeholders to view these standards online through any device that can access the Internet.

Up to date lists of the nuclear and support facilities at WL that are subject to CNSC regulatory oversight, and legacy facilities that were placed under care and maintenance of undergoing decommissioning under buildings removal plans, are maintained in the Canadian Nuclear Laboratories (CNL) document 900-514300-LST-001, *Site Licences, Certificates, Permits, Building/Facility Contacts, & Licence Representatives*.

Appendix A to the LCH provides definitions of terms and a list of acronyms used throughout it.

Unless otherwise specified in the LCH, days are to be interpreted as calendar days.

More information on the LCH is available in the CNSC document titled *How to Write a Licence Conditions Handbook* (LCH) (e-Doc [4967591](#)).

G. GENERAL

Licence Condition G.1: Licensing Basis

The licensee shall conduct the activities described in Part IV of this licence in accordance with the licensing basis, defined as:

- (i) the regulatory requirements set out in the applicable laws and regulations;**
- (ii) the conditions and safety and control measures described in the facility's or activity's licence and the documents directly referenced in that licence; and**
- (iii) the safety and control measures described in the licence application and the documents needed to support that licence application;**

unless otherwise approved in writing by the Canadian Nuclear Safety Commission (hereinafter "the Commission").

Preamble:

The licensing basis sets the boundary conditions for acceptable performance at a regulated facility or activity, thus establishes the basis for the CNSC's compliance program in respect of that regulated facility or activity. The degree to which the regulatory requirements are applied to WL and activities should reflect their importance to health and safety of persons, environment, national security, international obligations to which Canada has agreed, licensee's quality and economic expectations, the complexity of facility or activity, and the possible consequences if accidents occur or the activity is carried out incorrectly.

Where the licence condition requires the licensee to implement and maintain a particular program, the licensee documents that describe and implement the program are part of the licensing basis. Programs required by licence conditions or referred to in the LCH may or may not be health, safety, security, environment, and quality programs as defined in the Canadian Nuclear Laboratories Ltd. (CNL)'s management system.

Compliance Verification Criteria:

Part (i) of licensing basis

Part (i) of the licensing basis refers to applicable laws and regulations. There are many federal and provincial acts and regulations, and international laws, agreements, guidelines, etc., applicable to activities performed at WL.

The laws, regulations and international agreements for which CNSC has a regulatory role are:

- *Nuclear Safety and Control Act (NSCA)* and its regulations;
- *Impact Assessment Act, 2019 (IAA 2019)* and its regulations as well as its predecessor legislation;
- *Transportation of Dangerous Goods Act, 1992* and its regulations;
- *Canada Labour Code* and *Canada Occupational health and Safety Regulations*;
- *Nuclear Liability and Compensation Act* and its regulations;
- *Fisheries Act*; and
- Canada/IAEA safeguards agreements

All Memoranda of Understandings between the CNSC and other regulatory agencies or government departments are available on the CNSC Webpage under [Acts and Regulations/Domestic Arrangements](#).

GENERAL

Part (ii) of the Licensing Basis

Part (ii) of the licensing basis refers to the conditions and the safety and control measures included in the WL licence and in the documents directly referenced in the licence,

Under the standardized format and content, the WL licence requires the licensee to implement and maintain certain programs. For the purposes of meeting a licence requirement, a program may be a series of documented, coordinated activities, not necessarily a single document.

Part (iii) of the Licensing Basis

Part (iii) of the licensing basis refers to the safety and control measures described in the licence application and the documents needed to support that licence application. The safety and control measures include important aspects of documentation such as, but not limited to: the facility-specific design basis and operational information documented in the most recent safety analysis and operational limits and conditions documents.

Part (iii) of the licensing basis also includes safety and control measures outlined in CNSC regulatory documents, CSA standards, and other standards, codes and references that are cited in the application or in the licensee's supporting documentation.

Applicable licensee documents are listed in the LCH under the heading "Licensee Documents that Require Notification of Change". Applicable CNSC regulatory documents, CSA standards and other documents are listed in the LCH under the heading "Licensing Basis Publications". The licensee documents listed in the LCH could cite other documents that also contain safety and control measures (i.e., there may be safety and control measures in "nested" references in the application). The licensee documents listed in the LCH and their "nested" references define the licensing basis for the programs required by the licence as long as they include safety and control measures.

Regulatory Role of the Licensing Basis

The licensing basis is established when the Commission renders its decision regarding the licence application.

Licence condition G.1 requires the licensee to conduct the licensed activities in accordance with the licensing basis. For activities that are not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state consistent with the licensing basis, taking into account the risk significance of the situation.

The applicability of the licensing basis publications may be graded based on the specific activity being considered.

CNSC Staff's Approach to Assessing the Licensing Basis for Whiteshell Laboratories

Licence condition G.1 is not intended to unduly inhibit the ongoing management and operation of the facility or the licensee's ability to adapt to changing circumstances and continuously improve, in accordance with its management system. Where the licensing basis refers to specific configurations, methods, solutions, designs, etc., the licensee is free to propose alternate approaches as long as they remain, overall, in accordance with the licensing basis and have a neutral or positive impact on health, safety, the environment, security, and safeguards. However, the licensee shall assess changes to confirm that operations remain in accordance with the licensing basis. The assessment shall be documented and made available to CNSC staff upon request.

For any proposed activity to be carried out on the WL, CNSC staff will review the information submitted by CNL to independently determine if the proposed activity remains within the licensing basis. CNSC staff assess a proposed activity as being within the licensing basis based on the hazard and risk of the change, and its impact on the overall safety of the WL.

CNSC staff will submit to the Commission for consideration any proposed activity which CNSC staff consider to be outside of the licensing basis. If the Commission grants approval to such an activity, it will become part of the licensing basis for WL and reflected in updates to the LCH as appropriate.

Activities Included in the Whiteshell Laboratories Licensing Basis

Authorized licensed activities at WL include:

- a) operate and decommission the Whiteshell Laboratories (hereinafter “WL”) located in Pinawa, Province of Manitoba as further described in the Whiteshell Laboratories Licence Conditions Handbook (LCH),
- b) produce, possess, process, refine, transfer, use, package, manage, and store the nuclear substances that are required for, associated with or arise from the activities described in a),
- c) possess, use, produce and transfer prescribed equipment that is required for, associated with, or arises from the activities described in a),
- d) possess, use and transfer prescribed information that is required for, associated with, or arises from the activities described in a),
- e) carry out the site preparation, construction or construction modification or undertaking that is required for, associated with or arise from the activities described in a).

A complete list of all nuclear facilities at WL is found in 900-514300-LST-001, “Site Licences, Certificates, Permits, Building/Facility Contacts, & Licence Representatives”.

Licence Application Documents and Supporting Documents

Document Number	Document Title	e-Doc
WLD-CNNO-24-0010-L	Amended Application for Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories	7223772

Guidance:

The CNSC regulatory document REGDOC-3.5.3, *Regulatory Fundamentals*, outlines the CNSC’s regulatory philosophy and approach to applying the NSCA. It provides information for licensees, applicants and the public, and contains neither guidance nor requirements. In particular, subsection 6.1.1 of REGDOC-3.5.3 provides information about the licensing basis.

When the licensee becomes aware that a proposed change or activity might be outside the licensing basis, it should first seek direction from CNSC staff regarding the potential acceptability of this change or activity. The licensee should take into account that certain types of proposed changes might require significant lead times before CNSC staff can make recommendations and/or the Commission can properly consider them.

Licence Condition G.2: Notification of Changes

The licensee shall give written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs and methods referred to in the licensing basis.

Preamble:

Most changes to the WL and its facilities are captured as changes to corresponding licensee documents. The LCH identifies licensee documents that require written notification of changes to the CNSC.

Compliance Verification Criteria:

The licensee shall, as a minimum, notify CNSC staff of changes to licensee documents identified in the LCH. The written notification of change shall include a copy of the revised document and a description of the change.

CNL program requirements documents (PRDs) and program description documents (PDDs) are accompanied by governing document indices (GDIs). The licensee shall provide updated versions of GDIs annually or upon request from the CNSC.

Licensee documents listed in the LCH are subdivided into groups having different requirements for notification of change.

Prior Notification Requirement	Definition
Requires prior notification	<p>The licensee shall submit the revised document to the CNSC as far in advance of planned implementation as practicable, but no less than 30 days prior to planned implementation. The licensee shall allow sufficient time for the CNSC to review the change proportionate to its complexity and the importance of the safety and control measures being affected. This is denoted by a Y in the column “prior notification”.</p> <p>Where a document or some part of it requires acceptance by CNSC staff prior to implementation, a footnote has been added to the notification column.</p>
Requires notification at time of implementation	<p>The licensee shall notify the CNSC at the time of implementing a revised document. This is denoted by an N in the column “prior notification”.</p>

Notifications shall be provided in writing. Written notifications shall include a summary description of the change, the rationale for the change, expected duration (if not a permanent change), and a summary explanation of how the licensee has concluded that the change remains in accordance with the licensing basis (e.g., an evaluation of the impact on health, safety, security, the environment and Canada’s international obligations). A copy of the revised written notification document shall accompany the notification. All written notifications shall be transmitted to CNSC per established communications protocols.

The above also applies to a notice of change that requires CNSC staff acceptance, due to some other requirement in the licensing basis.

Changes that may affect the licensing basis, including any change that is not captured as a change to a document listed in the LCH (e.g., construction of new buildings, transitioning any building/land from one phase of the project to another, or infrastructure improvements), requires written notification to the CNSC to verify they are in accordance with the licensing basis. The licensee shall provide written notification to the CNSC for these types of changes as far in advance as possible, but no less than 30 days prior to planned implementation.

For any change that is outside the licensing basis defined in subsection G.1 of the LCH, the licensee shall obtain Commission approval before proceeding with the change.

Guidance:

For proposed changes that would not be in accordance with the licensing basis, the guidance for licence condition G.1 applies.

DRAFT

Licence Condition G.3: Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble:

The *General Nuclear Safety and Control Regulations* requires that a licence application contain “a description of any proposed financial guarantee relating to the activities to be licensed”.

The financial guarantee for WL is in the form of an expressed commitment. Atomic Energy of Canada Limited (AECL) is a Schedule III, Part 1 Crown Corporation under the *Financial Administration Act* and an agent of His Majesty in Right of Canada. As an agent of His Majesty in Right of Canada, AECL's liabilities are ultimately liabilities of His Majesty in Right of Canada. While the restructuring of AECL has seen the ownership of CNL transferred to a private-sector contractor, the Canadian National Energy Alliance (CNEA), AECL retains ownership of the lands, assets and liabilities associated with CNL's licences. These liabilities have been officially recognized by the Minister of Natural Resources in a letter dated July 31, 2015 and was reaffirmed in 2020 (e-Doc [4803454](#), [6373440](#), [6373441](#), [6373442](#)).

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.3.1	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	2021	March 31, 2022

Guidance:

None Provided.

Licence Condition G.4: Public Information and Disclosure Program

The licensee shall implement and maintain a public information and disclosure program.

Preamble:

Class I Nuclear Facilities Regulations require that an application for a licensee shall contain the proposed program to inform persons living in the vicinity of the site of the general nature and characteristics of the anticipated effects on the environment and the health and safety of persons that may result from the activity to be licensed.

The primary goal of a public information and disclosure program, as it relates to the licensed activities, is to ensure that information related to the health, safety and security of persons and the environment, and other issues associated with the lifecycle of the nuclear facilities are effectively communicated to the public. The public information program includes a public disclosure protocol describing the information and the medium of disclosure in regard to information and reports of interest to the public.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.2.1	Public Information and Disclosure	2018	December 8, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
CW-513430-REPT-001	Public Information Program for Canadian Nuclear Laboratories (CNL)	5507946	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-3.2.2	Indigenous Engagement, Version 1.2	2022

SCA – MANAGEMENT SYSTEM

Licence Condition 1.1: Management System

The licensee shall implement and maintain a management system.

Preamble:

Safe and reliable operation of nuclear facilities requires a commitment and adherence to a set of management system principles and, consistent with those principles, the implementation of planned and systematic processes that achieve expected results consistently and safely. The management system requirements apply to and support the safe conduct of all licensed activities at CNL.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed management system for the activity to be licensed, including measures to promote and support safety culture.

The *General Nuclear Safety and Control Regulations* require that a licence application contain the applicant's organizational management structure, including the internal allocation of functions, responsibilities and authority.

The management system is in place to satisfy the requirements set out in the NSCA, regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in the implementation of the management system. The management system promotes and supports a healthy safety culture. Characteristics of a healthy safety culture are as follows:

- Safety is a clearly recognized value;
- Accountability for safety is clear;
- Safety is integrated into all activities;
- A safety leadership process exists; and
- Safety culture is learning driven

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.1.2	Safety Culture	2018	January 1, 2020
CSA N286	Management system requirements for nuclear facilities	2012 (R2022)	January 1, 2020
CSA N286.6	Decommissioning Quality Assurance for Nuclear Power Plants	1998 (R2003)	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514100-MAN-001	CNL Management System Manual	5507946	Y
900-514200-PDD-001	Quality	5507946	N
900-514200-PRD-001	Quality	5507946	Y
900-511300-PDD-001	Information Management	5507946	N
900-511300-PRD-001	Information Management	5507946	Y
900-514100-LST-001	Functional Authorities	5507946	N
900-514300-LST-001	Site Licences, Certificates, Permits, Building/Facility Contacts, & Licence Representatives	5507946	N
900-514100-LST-002	Codes, Regulations, Standards, and other Documents	5507946	N
WLD-508300-QAP-001	Whiteshell Laboratories Decommissioning QA Plan	5776580	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N286.0.1	Commentary on N286-12, Management system requirements for nuclear facilities	2021

Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements

The licensee shall submit to the Commission or any person authorized by the Commission, reports covering the progress of the licensee's integrated assessment plan at Whiteshell Laboratories.

Preamble:

The licensee's Integrated Assessment Plan (IAP) provides a comprehensive list of assessment activities that are planned to be carried out by the licensee's management system processes. The IAP provides a three-year rolling plan for all assessment activities including self-assessments, internal and external audits, and program reviews.

This licence condition sets the requirements for reporting progress on the licensee's IAP to CNSC.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-514200-MCP-003171	Procedure: Integrated Assessment Plan	5776580	N

The licensee shall submit to the Commission or any person authorized by the Commission, an IAP progress monitoring report by April 30th of each year including:

- the purpose, and scope of each assessment (internal and external) conducted;
- the resulting recommendations, corrective actions raised (including action identifiers) in detail, planned effectiveness reviews and the targeted completion dates; and
- the status of previous corrective actions and results of effectiveness reviews.

The licensee shall submit the first IAP progress monitoring report covering January 1st to December 31st, 2024 by April 30th, 2025.

Guidance:

Document Number	Document Title	Version
REGDOC-3.1.2	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	2018

SCA – HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1: Human Performance Program

The licensee shall implement and maintain a human performance program.

Preamble:

Human performance is the outcome of human behaviours, functions and actions in a specified environment, reflecting the ability of workers and management to meet the system's defined performance under the conditions in which the system will be employed.

Human factors are factors that influence human performance as it relates to the safety of a nuclear facility or activity over all phases, including design, construction, commissioning, operation, maintenance, and decommissioning. These factors may include the characteristics of the person, task, equipment, organization, environment, and training. The application of human factors to issues such as interface design, training, procedures, organization and job design may affect the reliability of humans performing tasks under various conditions.

The human performance program addresses and integrates the range of human factors that influence human performance, including but not limited to:

- The provision of qualified workers;
- The reduction of human error;
- Organizational support for safe work activities;
- The continuous improvement of human performance; and
- Monitoring hours of work.

The *General Nuclear Safety and Control Regulations* require the licensee to: ensure the presence of sufficient number of qualified staff; train the workers; and ensure the workers follow procedures and safe work practices.

The *Class I Nuclear Facilities Regulations* require that an application for a licence shall contain the proposed human performance program for the activity to be licensed, including measures to ensure workers fitness for duty.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.4	Fitness for Duty: Managing Worker Fatigue	2017	January 1, 2020
REGDOC-2.2.4	Fitness for Duty, Volume II: Managing Alcohol and Drug Use, version 3 ¹	2021	January 27, 2022
REGDOC-2.2.4	Fitness for Duty, Volume III: Nuclear Security Officer Medical, Physical, and Psychological Fitness	2018	January 1, 2020

SCA HUMAN PERFORMANCE MANAGEMENT

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514000-PDD-001	Performance Assurance	5507946	N
900-514000-PRD-001	Performance Assurance	5507946	Y

¹ Fully implemented with the exception of random alcohol and drug testing of workers in safety-critical positions (e-Doc [6732074](#)).

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.2.5	Minimum Staff Complement	2019

Human Performance Program:

Human performance is the real-world results or outcomes of the work that people do, including how people carry out the work. Both the results and the people's activities are important because good results can be achieved through work activities that cause damage or harm, either in real time, or later on.

A human performance program is the cross-cutting overview of considering and managing the human, technology and organizational factors that influence human performance. Factors that influence human performance can be called "human factors". Examples of human factors are organizational and management structures; policies and programs; allocation of functions to humans and technology; the design of user interfaces; staffing provisions; fitness for duty, job design features; procedures; management and supervision; work schedules; design of procedures; training; competency; safety culture; and the physical work environment. The aim of the human performance program is to achieve the desired outcomes, including for safety, through supporting people to perform their work activities.

Understanding and improving human performance should take an integrated and strategic approach, which considers human error as a symptom of deeper issues and not the direct cause of failure. Improving human performance should be based on organizational learning and understanding of the factors that influence human performance. The licensee may follow industry good practices in developing the scope, content and approach of the human performance program.

Note that many of the topics considered under the Human performance program specific area are considered in detail by the CNSC elsewhere in the SCA framework. The human performance program specific area focuses on the overview of how the licensee manages the factors that influence human performance with the goal of supporting and achieving the desired human performance.

Human Performance should be managed via the management system, and where applicable, the human performance program should reference governing documentation for the facility. The documented human performance program can take the form of a "road map" that describes how the management system and other aspects of the organization are managed to support the desired human performance, or it may be a stand-alone document.

Licence Condition 2.2: Training Program

The licensee shall implement and maintain a training program.

Preamble:

This licence condition requires the licensee to develop and implement training programs for workers.

It also provides the requirements regarding the program and processes necessary to support responsibilities of, qualifications and requalification training of persons at the nuclear facility.

As defined by the *General Nuclear Safety and Control Regulations*, a worker is a person who performs work that is referred to in a licence. This includes contractors and temporary employees. Training requirements apply equally to these types of workers as to the licensee's own employees.

The *General Nuclear Safety and Control Regulations* require that licensees ensure that there are a sufficient number of properly trained and qualified workers to safely conduct the licensed activities.

The *Class I Nuclear Facilities Regulations* require that applicants for a Class I facility licence describe the training programs which have been implemented, and that licence applications include the proposed responsibilities, qualification requirements, training program and requalification program for workers; along with the results that have been achieved in implementing the program for recruiting, training and qualifying workers.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.2.2	Personnel Training, Version 2	2016	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	Version	Prior Notification
900-510200-PDD-001	Training and Development	5507946	N
900-510200-PRD-001	Training and Development	5507946	Y
900-510200-LST-001	Application of the Systematic Approach to Training (SAT) at CNL	5507946	N

The licensee shall ensure that all workers are qualified to perform the duties and tasks required of their position.

Guidance:

None provided.

SCA – OPERATING PERFORMANCE

Licence Condition 3.1: Operating Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures, policies, methods and procedures for safely operating and maintaining the nuclear facility.

The operational limits and conditions for WL are currently documented in

- Facility Authorizations, and
- laboratory protocols, criticality safety documents and other documents for other workplaces where operations with fissionable materials are performed involving handling, use, processing, movement and storage.

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-505240-PDD-001	Construction	5507946	N
900-505240-PRD-001	Construction	5507946	Y
900-505250-PDD-001	Commissioning	5507946	N
900-505250-PRD-001	Commissioning	5507946	Y
CCSF-00583-FA-001	Facility Authorization for the Operation of the Concrete Canister Storage Facility at Whiteshell Laboratories	5776580	Y ¹
WLSF-00583-FA-001	Facility Authorization for the Operation of the Shielded Facilities at Whiteshell Laboratories	5776580	Y ¹
WLWMA-00583-FA-001	Facility Authorization for the Operation of the Waste Management Area at Whiteshell Laboratories	5776580	Y ¹

¹ Notification is required only for non-administrative changes. If administrative changes are made, the licensee shall provide updated facility authorizations to CNSC staff at the end of the next quarter.

WL Facilities Operations

The operational limits and conditions shall define the conditions that must be met to prevent situations or events that might lead to accidents, or to mitigate the consequences of accidents should they occur. The updated operational limits and conditions shall be based on safety analyses.

Limits and conditions for normal operation shall include limits on operating parameters, stipulation for minimum amount of operable equipment, actions to be taken by the operating staff in the event of deviations from the operational limits and conditions, and the time allowed for completing these actions.

The licensee shall review, revise and reissue as appropriate the operational limits and conditions when required due to changes in technologies, regulations, operational information or physical configuration.

Construction and operation of New Nuclear Facilities

The licensee may construct or install facilities, buildings, structures, components or equipment only if that construction or installation is compliant with the licensing basis.

Facilities in Permanent Safe Shutdown State

The licensee shall develop and maintain storage-with-surveillance plans (SWS plans) for Class I and Class II nuclear facilities in permanent safe shutdown state. The licensee shall maintain those facilities in permanent safe shutdown state according to the SWS plan for the facility. The SWS plans may also be combined with detailed decommissioning plans (DDPs) when the decommissioning is taking place in several phases.

Facilities under Decommissioning

See LCH Section 11.2 for details regarding the decommissioning of individual facilities at WL.

Modifications to Facilities and Processes

The licensee shall ensure that modifications to WL facilities do not negatively impact safe operation of the facility. The licensee shall define the process for making permanent or temporary modifications to operational limits and conditions. Such modifications shall be justified by analyses and safety reviews.

The licensee may only modify facilities, buildings, structures, components or equipment in compliance with the licensing basis.

The licensee should review outstanding temporary modifications to determine whether they are still needed.

The licensee shall ensure that:

- a) all temporary modifications are identified at the point of application and at any relevant control positions;
- b) operating personnel are informed of any modifications and their consequences for facility operations;
- c) the temporary modifications are reviewed and approved before installation; the review shall be documented to demonstrate the scope and conclusion of the review;
- d) the number of simultaneous temporary modifications is kept to a minimum;
- e) the duration of temporary modifications is limited and specified prior to implementation;
- f) testing is performed after installation and removal of the temporary modification;
- g) temporary modifications are shown on affected documents; and

- h) the facility is returned to the original state when the temporary modification is no longer needed.

Sealed Sources

The licensee shall ensure the sealed sources are controlled (by maintaining an inventory of sealed sources, and tracking and reporting their transfer) in order to achieve the objectives stated in paragraph 5.(a) of section II of the International Atomic Energy Agency's (IAEA) *Code of Conduct on the Safety and Security of Radioactive Sources*.

The inventory of sealed sources shall contain all sealed sources, both in use and in storage, of any category of sources as defined in Table 1 of the IAEA safety guide RS-G-1.9 *Categorization of Radioactive Sources*. The licensee shall provide details of their inventory at the CNSC staff's request.

Unless otherwise permitted by the prior approval of the CNSC, the licensee shall, in respect of a radioactive nuclear substance set out in column 1 of table 3-1, report in writing to the CNSC staff any transfer or receipt of a sealed source whose corresponding activity is equal to or greater than the value set out in column 2 of the table.

- (a) at least seven business days before any transfer, and
(b) within two business days of any receipt of a transfer.

Table 3-1 Activity Limits for Reporting the Transfer of Sealed Sources

Column 1	Column 2
Nuclear Substance	(TBq)
Americium 241	0.6
Americium 241/Beryllium	0.6
Californium 252	0.2
Curium 244	0.5
Cobalt 60	0.3
Cesium 137	1
Gadolinium 153	10
Iridium 192	0.8
Promethium 147	400
Plutonium 238	0.6
Plutonium 239/Berilium	0.6
Radium 226	0.4
Selenium 75	2
Strontium 90 (Yttrium 90)	10
Thulium 170	200
Ytterbium 169	3

The written report shall be in a form acceptable to CNSC staff and shall include:

1. on transfer of a sealed source(s),
 - (a) the date of transfer,
 - (b) the name of the recipient and licence number,
 - (c) the address of the recipient's authorized location,
 - (d) the nuclear substance (radionuclide),
 - (e) activity (radioactivity) (Bq) per sealed source on the reference date,
 - (f) the reference date,
 - (g) the number of sealed source(s),
 - (h) the aggregate activity (Bq),
 - (i) the sealed source unique identifiers (if available), and
 - (j) where the sealed source is incorporated in prescribed equipment,
 - (i) the name and model number of the equipment, and
 - (ii) the equipment serial number (if available);
2. on receipt of a sealed source(s),
 - (a) the date of receipt of a transfer,
 - (b) the name of the shipper and licence number,
 - (c) the address of the shipper's authorized location,
 - (d) the nuclear substance (radionuclide),
 - (e) activity (radioactivity) (Bq) per sealed source on the reference date,
 - (f) the reference date,
 - (g) the number of sealed source(s),
 - (h) the aggregate activity (Bq),
 - (i) the sealed source unique identifiers (if available), and
 - (j) where the sealed source is incorporated in prescribed equipment,
 - (i) the name and model number of the equipment, and
 - (ii) the equipment serial number (if available).

In this subsection, "transfer" means movement of sealed sources from WL to locations outside of WL site, or from locations outside WL site to WL. It does not include the movement of sealed sources between various WL facilities/locations.

Guidance:

Facilities in Safe Shutdown State

Typical steps taken to transition the facility from operation to a permanent safe shutdown state are:

During the Operational Phase

1. The licensee defines and documents the activities needed to transition the facility from operation to a permanent safe shutdown state.
2. The licensee prepares the SWS plans
3. The licensee submits the documentation prepared during steps 1 and 2 to CNSC staff.

During the Transition Phase

4. The licensee performs the activities needed to put the facility in a long-term safe shutdown state, updates the SWS plans, and resubmits to CNSC staff if needed.

During the Permanent Safe Shutdown State

5. The licensee carries out actions as documented in the SWS plans.

DRAFT

Licence Condition 3.2: Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble:

This licence condition requires the licensee to implement and maintain a program for reporting information to CNSC, including compliance monitoring, operational performance, event reporting, and various types of notifications.

Many reportable occurrences included in REGDOC-3.1.2 do not necessarily show a degradation of licensee's performance, and do not fall under CNSC definition of a "reportable event" as included in REGDOC-3.6, *Glossary of CNSC Terminology*. An exercise of judgment is needed to select from all occurrences reported to CNSC; those that really constitute "reportable events". Sections 29 and 30 of the *General Nuclear Safety and Control Regulations* provides requirements for reportable events.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-3.1.2	Reporting Requirements, Volume I: Non-Power Reactor Class I Facilities and Uranium Mines and Mills	2022	January 1, 2025

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-514300-MCP-006	CNL Reporting to Regulatory Agencies	5507946	N

Compliance Monitoring: Annual Reporting

The licensee shall by the following dates submit to the Commission or any person authorized by the Commission, the following reports covering the preceding calendar year as follows:

- a) By April 30th of each year:
 - i. the operation and maintenance of the following facilities: Concrete Canister Storage Facility, Shielded Facilities, Waste Management Area, Building 300 (Research and Development), summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
 - ii. the status of the WR-1 Reactor, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and releases of hazardous substances from the facilities;
 - iii. a summary of changes to non-nuclear facilities and structures;

- iv. decommissioning activities associated with the following facilities: Concrete Canister Storage Facility, Shielded Facilities, Waste Management Area, Building 300 (Research and Development), and WR-1 reactor, summarizing facility and equipment performance and changes, changes to operating policies, changes in organization, reportable events, personnel radiation exposures, releases of nuclear substances from the facilities, and release of hazardous substances from the facilities;
 - v. changes to emergency authorities and organization, updates or changes to the radiation emergency procedures, status/changes in other program documentation, training activities, drill and exercise activities, status of emergency resources and facilities, interactions with outside agencies, and unplanned events in which the emergency response organization has been tested;
 - vi. the results of the effluent monitoring for nuclear substances, hazardous substances and personnel radiation exposures for WL.
- b) By April 30th of each year:
- i. an integrated assessment plan monitoring report as detailed in Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements.
- c) By June 30th of each year:
- i. the results of environmental monitoring for nuclear and hazardous substances;
 - ii. the results and activities of the Environmental Assessment Follow-Up Program for Whiteshell Laboratories.
- d) If an action level has been reached as set out in LC 7.1 and 9.1, the licensee shall submit a final written report of the matter within 45 days of becoming aware of the matter.

Guidance:

Event Reporting

To encourage reporting of situations or events that may result in improvement actions, event reporting should not be used as a tool for assessing or measurement of nuclear safety, or as a basis for assessing the licensee's performance.

For low safety significance events where CNL has already provided a preliminary report verbally and where no significant additional information is likely to be determined from further investigation, CNL may elect to combine the submission of a written preliminary report with a written full report. CNSC staff may request additional information to be provided in order to achieve regulatory close out.

For any event, the licensee should notify the CNSC whenever an extension is necessary to provide missing detailed information and should provide a date when the information will be submitted.

Compliance Monitoring: Annual Reporting

The annual reports should follow, where appropriate, the format and content presented in Appendix B of REGDOC-3.1.2.

SCA – SAFETY ANALYSIS

Licence Condition 4.1: Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

Preamble:

All event sequences which can occur in a nuclear facility or activity should be analyzed to ensure safe operation. A deterministic safety analysis evaluates the facility's responses to such events by using predetermined rules and assumptions. The objectives of the deterministic safety analysis are stated in CSA N292.0.

The *General Nuclear Safety and Control Regulations* require that a licence application contain a description and the results of any analyses performed.

The *Class I Nuclear Facilities Regulations* require, amongst other requirements, that an application for a licence to operate a Class I nuclear facility contains a final safety analysis report, and additional supporting information.

The licensee holds the responsibility for ensuring that the safety analysis is accurate and meets the regulatory requirements, and shall maintain adequate capability to perform or procure safety analysis and to train safety analysts.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.4.4	Safety Analysis for Class IB Nuclear Facilities	2022	December 31, 2026

For additional compliance verification criteria for Safety Analysis refer to the CSA N292 series documents in LCH Section 11.1.

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508770-PDD-001	Safety Analysis	5507946	N
900-508770-PRD-001	Safety Analysis	5507946	Y
See e-Doc 5776580	Safety Analyses and Nuclear Safety Notes	5776580	Y ¹

¹ Notification is required only for non-administrative changes. If administrative changes are made, the licensee shall provide updated safety analyses to CNSC staff at the end of the next quarter.

Every 5 years, the licensee shall review and revise, if necessary, the safety analysis report for facilities to confirm that the document accurately captures the condition of the facility, and that it remains valid and continues to meet safety goals, safety objectives, and acceptance criteria. The safety analysis report review shall be submitted to CNSC staff.

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC 2.4.4	Safety Analysis for Class IB Nuclear Facilities	2022
IAEA SSR-4	Safety of Nuclear Fuel Cycling Facilities	2017
IAEA TECDOC-1267	Procedures for Conducting Probabilistic Safety Assessment for Non-reactor Nuclear Facilities	2002
IAEA SSG-18	Meteorological and Hydrological Hazards in Site Evaluation for Nuclear Installations	2011

DRAFT

Licence Condition 4.2: Nuclear Criticality Safety Program

The licensee shall implement and maintain a nuclear criticality safety program.

Preamble:

This licence condition requires the licensee to develop, implement and maintain a nuclear criticality safety program to ensure that the upper subcritical limits established in the criticality safety documents will not be exceeded under both normal and credible abnormal conditions (events or event sequences having the frequency of occurrence equal to or more than 10^{-6} /year) during operations with fissionable materials outside reactors.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.4.3	Nuclear Criticality Safety, version 1.1	2020	June 3, 2021

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508550-PDD-001	Nuclear Criticality Safety	5507946	N
900-508550-PRD-001	Nuclear Criticality Safety	5507946	Y
See e-Doc 5776580	Criticality Safety Documents and Time Limited Amendments	5776580	N ¹

¹ Notification is required only for non-administrative changes. If administrative changes are made, the licensee shall provide updated criticality safety documents to CNSC staff at the end of the next quarter.

For legacy activities or projects, the licensee may implement the requirements of the nuclear criticality safety on a graded approach, with appropriate criteria for categorization according to their safety significance. The legacy items are those nuclear criticality safety related activities and projects where work has begun prior to November 1, 2011.

Guidance:

None provided.

SCA – PHYSICAL DESIGN

Licence Condition 5.1: Design Program

The licensee shall implement and maintain a design program.

Preamble:

The *Class I Nuclear Facilities Regulations* require that a licence application contain a description of the structures, systems and components (SSC), and relevant documentation of the facility design.

A design program ensures that the facility design is managed using a well-defined systematic approach.

Implementing and maintaining a design program confirms that safety-related SSCs and any modifications to them continue to meet their design bases given new information arising over time and taking changes in the external environment into account. It also confirms that SSCs continue to be able to perform their safety functions under all facility states. An important cross-cutting element of a design program is design basis management.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N393	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	2013 (R2018)	January 1, 2020
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2022	TBD
	National Fire Code of Canada	2020	January 1, 2025
	National Building Code of Canada	2020	January 1, 2025

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508120-PDD-001	Design Authority and Design Engineering	5507946	N
900-508120-PRD-001	Design Authority and Design Engineering	5507946	Y

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.5.1	General Design Considerations: Human Factors	2019

Licence Condition 5.2: Pressure Boundary Program

The licensee shall implement and maintain a pressure boundary program.

Preamble:

A pressure boundary program is comprised of the many programs, processes and procedures and associated controls that are required to ensure compliance with CSA standard N285.0, which defines the technical requirements for the design, procurement, fabrication, installation, modification, repair, replacement, testing, examination and inspection of pressure-retaining and containment systems, including their components and supports.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N285.0	General requirements for pressure-retaining system and components in CANDU nuclear power plants	2017 (Update No. 1)	November 30, 2024
CSA B51	Boiler, Pressure Vessel and Pressure Piping Code	2014	

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508140-PDD-001	Pressure Boundary	5507946	N
900-508140-PRD-001	Pressure Boundary	5507946	Y
WLD-508140-PRO-001	Code Classification and Design Registration of Pressure – Retaining System/Components	5776580	Y
WL-508140-QAP-001	WL Pressure Boundary Quality Assurance Plan	5776580	N

For the WL, compliance with this licence condition will be assessed by the following;

- Subject to b) and c) below, the licensee shall design, manufacture, fabricate, procure, install, modify, repair, test, examine, inspect or otherwise perform work related to vessels, boilers, systems, piping, fittings, parts, components and supports according to the specifications in CSA standards N285.0-17 Update No. 1, B51-14 or other codes and standards approved or prescribed by the Commission.

Where indicated by these standards, the licensee shall obtain the following regulatory approvals for this work:

- i. registered designs;
 - ii. accepted overpressure protection reports;
 - iii. approval of applicable standards and code classification;
 - iv. registered welding and brazing procedures;
 - v. qualified welders, welding operators, brazers and examination personnel;
 - vi. accepted quality assurance programs; and
 - vii. accepted plans and procedures (certificate(s) of authorization).
- b) CNL may classify as Class 6 systems or sections of systems that contain tritium or other radioactive substances, if the consequence of failure limit of 20 mSv effective acute whole body dose is not exceeded.
- c) CNL shall carry out the activities listed in a) above in accordance with B51-14, or other codes and standards approved or prescribed by the Commission, for pressure boundary systems and components that do not contain nuclear substances, do not adversely impact a nuclear safety system, or do not cause an unreasonable risk involving nuclear substances at WL.
- d) CNL shall operate vessels, boilers, systems, piping, fittings, parts, components, and supports safely and keep them in a safe condition. The licensee shall:
- i. follow accepted plans and procedures to test, maintain, or alter overpressure protection devices;
 - ii. comply with operating limits specified in certificates, orders, designs, overpressure protection reports, and applicable codes and standards;
 - iii. inspect and perform material surveillance according to accepted schedules, plans and procedures;
 - iv. have any certified boiler or vessel that is in operation or use inspected and certified by an authorized inspector according to an accepted schedule; and
 - v. ensure that vessels, boilers, systems, piping, fittings, parts, components and supports have markings, as specified in the applicable standards.
- e) CNL shall keep proper records of regulatory approvals and other documents required as set out in a) through d), and the standards applicable to the work or equipment.
- f) In addition to any reporting requirements of the *Nuclear Safety and Control Act* and its associated Regulations, CNL shall report promptly to the Commission and to the Manitoba Department of Labour and Immigration when the licensee learns of any failure of a pressure boundary that has caused injury, death or property damage.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N285.0.1	Commentary on CSA N285.0-17, General requirements for pressure-retaining systems and components in CANDU nuclear power plants	2018

SCA – FITNESS FOR SERVICE

Licence Condition 6.1: Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed measures, policies, methods and procedures to maintain the nuclear facility.

The fitness for service SCA covers activities that impact the physical condition of structures, systems and components to ensure that they remain effective over time. This area includes programs that verify equipment is available to perform its intended design function when called upon to do so.

Compliance Verification Criteria:

Licence Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508230-PDD-001	Fitness for Service	5507946	N
900-508230-PRD-001	Fitness for Service	5507946	Y
WLD-106100-PLA-001	Periodic Inspection Plan for Whiteshell Laboratories Waste Management Area Concrete Bunkers	5776580	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.6.3	Aging Management	2014

SCA – RADIATION PROTECTION

Licence Condition 7.1: Radiation Protection Program

The licensee shall implement and maintain a radiation protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Radiation Protection Regulations* (RPR) require that the licensee implement a radiation protection program and also ascertain and record doses for each person who performs any duties in connection with any activity that is authorized by the NSCA or is present at a place where that activity is carried out. This program must ensure that doses to persons do not exceed prescribed dose limits and are kept as low as reasonably achievable (ALARA), social and economic factors being taken into account. Also, the program must ensure that occupational exposures are ascertained and recorded in accordance with the RPR through the establishment of dosimetry requirements.

The regulatory dose limits for workers are explicitly provided in the RPR. The RPR also specifies the requirements related to action levels (ALs) and indicate that the licence will be used to identify their notification timeframes.

ALs are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL is reached, a loss of control of some part of the associated radiation protection program may have occurred, and specific action is required, as defined in the RPR and the licence. ALs are not intended to be static and are to reflect operating conditions at the WL site.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508740-PDD-001	Radiation Protection	5507946	N
900-508740-PRD-001	Radiation Protection	5507946	Y
900-508740-MCP-006	Action Levels for Internal and External Exposures	5507946	Y
900-508740-MCP-007	Dose Control Points	5507946	N
900-508740-MCP-026	ALARA Review and Assessment - Planning and Control of Radiation Work	5507946	N
900-508740-STD-005	Design and Modification Considerations	5507946	N
900-508740-STD-019	Radiation Levels and Limits	5507946	N

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.7.1	Radiation Protection	2021
REGDOC-2.7.2	Dosimetry, Volume I: Ascertaining Occupational Dose	2021

The licensee should conduct a documented review and, if necessary, revise the ALs at least once every five years in order to validate their effectiveness. The results of such reviews should be provided to CNSC staff.

DRAFT

SCA – CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1: Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain the proposed worker health and safety policies and procedures.

As a federally regulated site, WL is also subject to the requirements of *Canada Labour Code* and *Canada Occupational Health and Safety Regulations*. Many activities at the WL may be performed by contractors who are subject to requirements under *Manitoba Workplace Safety and Health Act and Regulation*.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-510400-PDD-001	Occupational Safety and Health	5507946	N
900-510400-PRD-001	Occupational Safety and Health	5507946	Y

Employment and Social Development Canada is mandated with overseeing and enforcing compliance with the *Canada Labour Code* and its regulations. CNSC staff monitor licensee compliance with its conventional health and safety program, and will take regulatory actions for any potential unsafe work practice situations.

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.8.1	Conventional Health and Safety	2019

SCA – ENVIRONMENTAL PROTECTION

Licence Condition 9.1: Environmental Protection Program

The licensee shall implement and maintain an environmental protection program, which includes a set of action levels. When the licensee becomes aware that an action level has been reached, the licensee shall notify the Commission within seven days.

Preamble:

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information related to environmental protection. The *General Nuclear Safety and Control Regulations* requires every licensee to take all reasonable precautions to protect the environment. The *Radiation Protection Regulations* prescribe the radiation dose limits for the general public of 1 mSv per calendar year.

The *Radiation Protection Regulations* specify requirements related to “Action Levels” and indicate that the licence will be used to identify the action levels and the notification timeframes.

The release of hazardous substances is regulated by the CNSC as well as Environment Climate Change Canada through various acts and regulations.

The environmental protection SCA includes the following:

- Effluent and emissions control (releases);
- Environmental management system (EMS);
- Assessment and monitoring;
- Protection of the public; and
- Environmental Risk Assessment.

Action levels (ALs) for environmental releases are calculated by the licensees and aim to alert licensees of a potential loss of control of their environmental protection program. By definition, if an action level is reached, a loss of control of some part of the associated environmental protection program may have occurred, and specific action is required. ALs are not intended to be static and are to reflect operating conditions at the WL site. The ALs for environmental releases are included in 900-509200-STD-016, *Administrative Levels and Action Levels for WL Air and Liquid Radioactive Effluents*.

Compliance Verification Criteria:

The licensee will implement and maintain programs to ensure environmental protection as set out in licensing basis (LCH G.1).

CSA N286, included in LCH Section 1.1, defines other specific compliance verification criteria that support environmental protection.

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.9.1	Environmental Principles, Assessments and Protection Measures, Version 1.2	2020	January 1, 2025

Document Number	Document Title	Version	Effective Date
N288.0	Environmental management of nuclear facilities: Common requirements of the CSA N288 series of standards	2022	TBD
N288.1	Guidelines for modelling radionuclide environmental transport, fate, and exposure associated with the normal operation of nuclear facilities	2020	January 1, 2026
N288.4	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	2010 (R2015)	January 1, 2020
N288.4	Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills	2019	TBD
N288.5	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	2011 (R2016)	January 1, 2020
N288.5	Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills	2022	TBD
N288.6	Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	2012 (R2017)	January 1, 2020
N288.6	Environmental risk assessment at Class I nuclear facilities and uranium mines and mills	2022	June 1, 2028
N288.7	Groundwater protection programs at Class I nuclear facilities and uranium mines and mills	2015 (R2020)	January 1, 2020
N288.8	Establishing and implementing action levels to control releases to the environment from nuclear facilities	2017 (R2022)	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-509200-PDD-001	Environmental Protection	5507946	N
900-509200-PRD-001	Environmental Protection	5507946	Y
900-509200-STD-016	Administrative Levels and Action Levels for WL Air and Liquid Radioactive Effluents	5776580	Y
WL-509211-RRD-001	Derived Release Limits for CNL's Whiteshell Laboratories	5776580	Y
WL-509200-OV-001	Whiteshell Laboratories Integrated Monitoring Program Framework	5776580	N
WL-509200-PLA-001	WL Effluent Verification Monitoring Plan	5776580	Y
AECL Document No 03704 001	Environmental Assessment Follow up Program for Whiteshell Laboratories	5776580	Y

The licensee shall implement all follow-up actions identified as a result of impact or environmental assessments, and shall report the progress to CNSC staff on an annual basis.

The licensee will ensure effluent monitoring for nuclear and/or hazardous substances is designed, implemented and managed to respect applicable laws/regulation and to incorporate best practices. The effluent monitoring program will provide for control of airborne and waterborne effluents. The licensee shall control, monitor and record releases of radioactive and/or hazardous substances.

The licensee will establish the DRLs in accordance with CSA N288.1. The dose to the critical group due to the sum of all radioactive releases in any period of 12 consecutive months shall not exceed 1 mSv.

The licensee will conduct an updated site-wide environmental risk assessment (ERA) in accordance with the CSA Standard N288.6-12 *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills* taking into account current conditions at the WL site.

The licensee will control radiological releases to ALARA, within the DRLs, and take action to investigate and correct the cause(s) of increased releases should they occur. The licensee shall report the releases in accordance with LCH Section 3.2.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N288.1	Guidelines for modelling radionuclide environmental transport, fate, and exposure associated with the normal operation of nuclear facilities.	2020
CSA N288.2	Guidelines for calculating the radiological consequences to the public of a release of airborne radioactive material for nuclear reactor accidents	2019

SCA – EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1: Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

Preamble:

This licence condition requires the licensee to establish an emergency preparedness program to prepare for, to respond to, and to recover from the effects of accidental radiological/nuclear and/or hazardous substance release. As part of the emergency preparedness program, the licensee establishes an onsite emergency response plan and an emergency response organization and makes arrangements for coordinating off-site activities and cooperating with external response organizations throughout all phases of an emergency.

The *Class I Nuclear Facilities Regulations* requires measures to prevent or mitigate the effects of accidental releases of nuclear substances and hazardous substances on the environment, the health and safety of persons and the maintenance of national security, including measures to assist, notify, report to off-site authorities including the testing of the implementation of these measures.

A security response to malevolent acts is governed by a separate plan under the Nuclear Security Program (See LCH Section 12.1) but provisions of the licensee site security report apply to any associated potential threat of release of radioactive material – for example, the need for off-site notification, situation updates and confirmation of any radioactive releases.

Liquid release response and radioactive materials transportation emergency response plan are also governed by separate plans (See LCH Sections 9.1 and 14.1, respectively).

WL has a communication program that covers a broad spectrum – community interface meetings, newsletters, websites, committees and various panels.

WL provides the local municipalities and the province (as required, federal) with hazard information that can be used for community communications during an emergency.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.10.1	Nuclear Emergency Preparedness and Response, Version 2	2016	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508730-PDD-001	Emergency Preparedness	5507946	N
900-508730-PRD-001	Emergency Preparedness	5507946	Y
WL-508730-PLA-001591	Whiteshell Laboratories Emergency Response Plan	5776580	N

REGDOC-2.10.1 shall be applied to WL as a whole, not to individual facilities on site. Requirements for reactor facilities with a thermal capacity greater than 10MW are not applicable.

Guidance:

Guidance Documents

Document Number	Document Title	Version
CSA N1600	General requirements for nuclear emergency management programs	2021

Licence Condition 10.2: Fire Protection Program

The licensee shall implement and maintain a fire protection program.

Preamble:

Licensees require a comprehensive fire protection program to ensure the licensed activities do not result in unreasonable risk to the health and safety of persons and to the environment due to fire and to ensure that the licensee is able to efficiently and effectively respond to emergency fire situations.

Fire protection provisions, including response, are required for the design, construction, commissioning, operation, and decommissioning of nuclear facilities, including structures, systems, and components (SSCs) that directly support the plant and the protected area. External events such as an aircraft crash or security threats are addressed in LCH Section 12.1.

The *National Fire Code of Canada* sets out technical provisions regulating (a) activities related to the construction, use or demolition of buildings and facilities; (b) the condition of specific elements of buildings and facilities; (c) the design or construction of specific elements of facilities related to certain hazards; and (d) protection measures for the current or intended use of buildings.

The *National Building Code of Canada* sets out technical provisions for the design and construction of new buildings. It also applies to the alteration, change of use and demolition of existing buildings.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2013 (R2018)	January 1, 2020
CSA N393	Fire protection for facilities that process, handle, or store nuclear substances	2022	TBD
	<i>National Fire Code of Canada</i>	2020	January 1, 2025
	<i>National Building Code of Canada</i>	2020	January 1, 2025

Licensor Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508720-PDD-001	Fire Protection	5507946	N
900-508720-PRD-001	Fire Protection	5507946	Y
900-508720-MCP-006	Impairment, Notification and Compensatory Measures	5507946	N
See e-Doc 5776580	WL Fire Protection Assessment Documents (Code Compliance Review and Fire Assessment)	5776580	Y ¹

Document Number	Document Title	e-Doc	Prior Notification
151-508720-PRO-003517	Whiteshell Staffing, Equipment and Apparatus	5776580	Y

¹ Fire Hazard Assessments are to be reviewed and accepted by the CNSC prior to implementation in accordance with the requirements in CSA N393.

As required by CSA standard N393, fire protection assessments shall be prepared for nuclear facilities and shall include Code Compliance Review (CCR) and Fire Hazard Assessment (FHA). The results of the CCR and FHA shall be documented and submitted to CNSC for acceptance. The CCR and FHA shall be maintained as necessary to reflect nuclear facility modifications, significant changes in fire hazards, operating experience, and operational changes, and shall be updated or confirmed at least once every 5 years.

The licensee shall submit the results of third-party reviews required by CSA N393 (review of modifications, review of performance-based design or operation, fire protection program (FPP) audit, and evaluation of fire response capability). The results of these reviews shall be submitted to CNSC staff no later than six months after the review together with any corrective action plans with compensatory measures for identified non-compliances.

Changes of use or modifications for which the fire screening assessment indicates no potential impact on fire protection design basis, goals or criteria may not be subject to any further third-party review or require submission to the CNSC.

Fire Response

As required by CSA N393, a review of the Facility Fire Brigade (FFB) governance and performance shall be included in the FPP audit described above. The FPP audit shall include direct observation and assessment of at least one FFB fire response drill. The FFB drill assessment is to analyze and ensure competencies of the FFB against the CSA N393 standard and the National Fire Protection Association (NFPA) standards.

An independent third-party auditor is required to be an expert in the discipline, normally firefighting and qualified through specific education and relevant experience. The third-party auditor is required to be independent or at “arm’s length” from the facility to ensure impartiality. The review shall be of sufficient depth and detail to allow the reviewer to attest with reasonable confidence on the overall FFB program management and competencies of the FFB at the facility.

Guidance:

Where CSA N393 does not address a fire protection topic or issue in whole, or where additional guidance is beneficial, the standards and recommended practices set out by the NFPA are used as guidance by CNSC staff in determining the adequacy of a fire protection measure. The results of the third-party audit report will typically consist of a report which compares the requirements of the applicable codes and standards against the implementation of the fire protection program or the fire response exercised (based on the scope of the audit). The report should identify any non-compliance and formulate a conclusion on whether the licensee fire protection program, including FFB program management and drill performance, meets the requirements of N393.

SCA – WASTE MANAGEMENT

Licence Condition 11.1: Waste Management Program

The licensee shall implement and maintain a waste management program.

Preamble:

The “waste management” safety and control area covers internal waste-related programs that form part of the WL operations up to the point where the waste is removed from the WL to a separate waste management facility, location, or site. Specific areas include waste characterization, waste minimization, waste management practices, and decommissioning plans.

CNSC regulatory document REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada* describes the national framework and philosophy underlying the CNSC’s approach to regulating the management of radioactive waste and decommissioning, and explains the principles taken into account in CNSC regulatory decisions.

CNSC Regulatory Document REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste* defines radioactive waste as any material (liquid, gaseous, or solid) that contains a radioactive nuclear substance, as defined in section 2 of the NSCA, for which no further use is foreseen. In addition to containing nuclear substances, radioactive waste may also contain hazardous substances that are not radioactive, as defined in section 1 of the *General Nuclear Safety and Control Regulations*.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.11.1	Waste Management, Volume I: Management of Radioactive Waste	2021	March 31, 2022
REGDOC-2.11.1	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	2021	March 31, 2022
CSA N292.0	General principles for the management of radioactive waste and irradiated fuel	2019	March 31, 2022
CSA N292.2	Interim dry storage of irradiated fuel	2013 (R2018)	January 1, 2020
CSA N292.3	Management of low- and intermediate-level radioactive waste	2014	January 1, 2020
CSA N292.4	Storage of radioactive waste and irradiated fuel	2023	TBD
CSA N292.8	Characterization of Radioactive Waste and Irradiated fuel	2021	March 31, 2026

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508600-PDD-001	Waste Management	5507946	N
900-508600-PRD-001	Waste Management	5507946	Y

The licensee shall not produce, in the course of the licensed activities, or accept from outside clients, waste for which there is no identified treatment, or storage, or disposal facility.

Guidance:

Guidance Documents

Document Number	Document Title	Version
REGDOC-2.11	Framework for Radioactive Waste Management and Decommissioning Canada, Version 2	2021
CSA N292.5	Guideline for the exemption or clearance from regulatory control of materials that contain or potentially contain, nuclear substances	2011 (R2021)

Licence Condition 11.2: Decommissioning Plan

The licensee shall maintain a decommissioning plan.

Preamble:

The “waste management” safety and control area covers internal waste-related programs that form part of the facility’s operations up to the point where the waste is removed from the facility to a separate waste management facility. This area also covers the planning for decommissioning.

CNSC Regulatory Document REGDOC-2.11, *Framework for Radioactive Waste Management and Decommissioning in Canada*, describes the national framework and philosophy underlying the CNSC’s approach to regulating decommissioning.

CNSC Regulatory Document REGDOC-2.11.2, *Decommissioning* defines decommissioning as the administrative and technical actions taken to allow the removal of some or all of the regulatory controls from a facility, location or site where nuclear substances are managed, used, possessed or stored. Decommissioning actions are the procedures, processes and work activities (e.g., storage with surveillance, decontamination, dismantling or cleanup) that are taken to retire a facility, location or site from service with due regard for the health and safety of people and the environment.

Class I Nuclear Facilities Regulations requires that a licence application contain the proposed plan for decommissioning of the nuclear facility or of the site. The decommissioning plan for WL site is documented in the *Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview* and the associated cost estimate.

WL is undergoing decommissioning in a staged manner. Consequently, it is noted that not all volumes of the detailed decommissioning plan have been developed, as they are developed when so required by CNL. For volumes not yet developed, decommissioning activities cannot proceed without CNSC concurrence.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.11.2	Decommissioning	2021	March 31, 2025
CSA N294	Decommissioning of facilities containing nuclear substances	2009 (R2014)	January 1, 2020
CSA N294	Decommissioning of facilities containing nuclear substances	2019	March 31, 2025

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notice
900-508300-PDD-001	Cleanup	5507946	N
900-508300-PRD-001	Cleanup	5507946	Y
WLD-508330-SWS-000024	Storage with Surveillance Plan for Whiteshell Laboratories Building 100 – Whiteshell Reactor #1	5776580	Y
WLDP-02000-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview	5776580	Y ¹
WLDP-02000-DDP-001 AD	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 1 – Program Overview – Addendum	5776580	Y ¹
WLDP-21400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 2 - Shielded Facilities	5776580	Y ¹
WLDP-26400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 6 – Whiteshell Reactor #1: Building 100	5776580	Y ¹
WLDP-22500-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 7 – Concrete Canister Storage Facilities (CCFS)	5776580	Y ¹
	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 1 - Standpipes	5776580	Y ¹
	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 2 – ILW Bunkers, B417, Amine Tanks	5776580	Y ¹
WLDP-24400-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 8 – Waste Management Area – Part 3 – Operational Structures, LLW Liabilities and WMA Grounds	5776580	Y ¹
WLDP-23500-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 9 – Building 300	5776580	Y ¹
WLDP-23500-DDP-001 AD	Whiteshell Laboratories Detailed Decommissioning Plan – Volume 9 – Building 300 - Addendum	5776580	Y ¹

SCA WASTE MANAGEMENT

Document Number	Document Title	e-Doc	Prior Notice
WLDP-37000-DDP-001	Whiteshell Laboratories Detailed Decommissioning Plan: Volume 11 Health and Safety Buildings 402 and 305	5776580	Y ¹
RC-2143-12 Part 1	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 1: South-Side Buildings	5776580	Y ¹
WLDP-32000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 2: North-Side Buildings	5776580	Y ¹
WLDP-33000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 3: Outer-Area Building and Facilities	5776580	Y ¹
WLDP-34000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 4: Site Services	5776580	Y ¹
WLDP-35000-DDP-001	Volume 12 - Whiteshell Laboratories Licensed Site Supporting and General Infrastructure, Part 5: Site Affected Lands and Contaminated Structures	5776580	Y ¹

¹ DDPs are to be reviewed and accepted by the CNSC in accordance with the requirements in CSA N294.

Note: The Whiteshell Laboratories Detailed Decommissioning Plan - Volume 3: Van de Graaff Accelerator, the Whiteshell Laboratories Detailed Decommissioning Plan - Volume 4: Neutron Generator, Whiteshell Laboratories Detailed Decommissioning Plan – Volume 5 – Active Liquid Waste Treatment Centre Building 200 and the Whiteshell Laboratories Detailed Decommissioning Plan - Volume 10: Decontamination Centre Building 411 have been completely decommissioned and are therefore not listed in the above table.

Facilities under Decommissioning

The licensee shall conduct decommissioning activities in accordance with Volumes 1 to 12 of the Whiteshell Laboratories Detailed Decommissioning Plan. Decommissioning plans are reviewed by CNSC staff and decommissioning activities cannot proceed without CNSC concurrence.

Guidance:

None provided.

SCA – SECURITY

Licence Condition 12.1: Security Program

The licensee shall implement and maintain a security program.

Preamble:

Nuclear security puts in place provisions to prevent, detect and stop malevolent acts, such as theft, sabotage, unauthorized access, illegal transfer or other acts involving nuclear material, other radioactive substances or their associated facilities.

The *General Nuclear Safety and Control Regulations* require that a licence application contain information related to site access control and measures to prevent loss or illegal use, possession or removal of the nuclear substance, prescribed equipment or prescribed information.

The *Class I Nuclear Facilities Regulations* require that a licence application contain the proposed measures to prevent acts of sabotage or attempted sabotage at the nuclear facility.

The *Nuclear Security Regulations* require that a licence application contain specific information related to nuclear security, stipulates the requirements for high-security sites, and contains specific requirements pertaining to the transportation of Category I, II or III nuclear material.

The *Nuclear Security Regulations* require that a licensee of a high security site:

- maintain at all times a qualified onsite nuclear response force;
- obtain the applicable certifications, before issuing an authorization to a nuclear security officer;
- prevent and detect unauthorized entry into a protected area or inner area; and
- prevent unauthorized entry of weapons and explosive substances into a protected area or inner area.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.12.1 (prescribed information)	High-Security Sites, Volume I: Nuclear Response Force, Version 2	2018	January 1, 2020
REGDOC-2.12.1 (prescribed information)	High-Security Facilities, Volume II: Criteria for Nuclear Security Systems and Devices	2018	January 1, 2020
REGDOC-2.12.2	Site Access Security Clearance	2013	January 1, 2020
REGDOC-2.12.3	Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	2020	June 3, 2021
CSA N290.7	Cyber-security for nuclear power plants and small reactor facilities	2014 (R2015)	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508710-PDD-001	Security	5507946	N
900-508710-PRD-001	Security	5507946	Y
900-511400-PDD-001	Cyber Security	5507946	N
900-511400-PRD-001	Cyber Security	5507946	Y
EPS-14000-RPT-18 (prescribed information)	Site Security Report	5776580	Y
119-508710-PLA-010 (prescribed information)	Implementation Plan: Tiered Response Force (TRF)	5776580	Y

The CSA standard N290.7 covers the cyber security of new and existing nuclear power plants and small reactor facilities.

The CNL document EPS-14000-RPT-18 *Site Security Report* is required to be updated periodically and resubmitted to CNSC staff. The site security report shall be updated and resubmitted when there are significant changes to the program.

Guidance:

None provided.

SCA – SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1: Safeguards Program

The licensee shall implement and maintain a safeguards program.

Preamble:

Safeguards is a system of inspection and other verification activities undertaken by the International Atomic Energy Agency (IAEA) in order to evaluate a Member State's compliance with its obligations pursuant to its safeguards agreements with the IAEA.

The *General Nuclear Safety and Control Regulations* requires the licensee to take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement.

The *Class I Nuclear Facilities Regulations* requires that a licence application contain information on the licensee's proposed measures to facilitate Canada's compliance with any applicable safeguards agreement.

Canada has entered into a safeguards agreement with the IAEA pursuant to its obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. The objective of the Canada/IAEA safeguards agreements is for the IAEA to provide assurance on an annual basis to Canada and to the international community that all declared nuclear materials are in peaceful, non-explosive uses and that there is no indication of undeclared nuclear materials or activities. This conclusion confirms that Canada is in compliance with its obligations under the following Canada/IAEA safeguards agreements:

- [Treaty on the Non-Proliferation of Nuclear Weapons](#);
- [Agreement Between the Government of Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons](#); and
- [Protocol Additional to the Agreement Between Canada and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons](#).

These are reproduced in information circulars INFCIRC/140, INFCIRC/164, and INFCIRC/164/Add. 1.

Compliance Verification Criteria:

Licensing Basis Publications

Document Number	Document Title	Version	Effective Date
REGDOC-2.13.1	Safeguards and Nuclear Material Accountancy	2018	January 1, 2020

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508510-PDD-001	Nuclear Materials and Safeguards Management	<u>5507946</u>	N

Document Number	Document Title	e-Doc	Prior Notification
900-508510-PRD-001	Nuclear Materials and Safeguards Management	5507946	Y

The licensee shall obtain prior written approval of the CNSC, for any changes to operation, equipment or procedures requested by the licensee that would affect the implementation of safeguards measures.

Guidance:

None Provided.

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SCA – PACKAGING AND TRANSPORT

Licence Condition 14.1: Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

Preamble:

Every person who transports radioactive material, or requires it to be transported, shall act in accordance with the requirements of the *Transportation of Dangerous Goods Regulations* (TDGR) and the *Packaging and Transport of Nuclear Substances Regulations, 2015* (PTNSR 2015).

The TDGR and PTNSR provide specific requirements for the design of transport packages, the packaging, marking and labeling of packages and the handling and transport of nuclear substances.

Compliance Verification Criteria:

Licensee Documents that Require Notification of Change

Document Number	Document Title	e-Doc	Prior Notification
900-508520-PDD-001	Transportation of Dangerous Goods	5507946	N
900-508520-PRD-001	Transportation of Dangerous Goods	5507946	Y

The licensee shall implement and maintain a packaging and transport program that will ensure compliance with all the requirements set out in the TDGR and PTNSR for all shipments of nuclear substances to and from the WL.

Shipments of nuclear substances within the WL site where access to the property is controlled are exempted from the application of the PTNSR and TDGR except for sections 6 and 7 of the PTNSR. Sections 6 and 7 refer to the CNSC *Nuclear Security Regulations*, specifically to the transport of Category I, II or III nuclear material. TDGR do not apply per subsection 1.25 of those regulations.

Guidance:

Guidance Documents

Document Number	Document Title	Version
RD-364	Joint Canada-United States Guide for Approval of Type B(U) and Fissile Material Transportation Packages	2009
REGDOC-2.14.1	Information Incorporated by Reference in Canada's Packaging and Transport of Nuclear Substances Regulations, 2015, Version 2	2021

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APPENDIX A: DEFINITIONS AND ACRONYMS

1. DEFINITIONS

The following is a list of definitions of words or expressions used in the LCH that may need clarification; they are defined for the purpose of the LCH only. All other terms and expressions used in the LCH are consistent with the definitions provided in the NSCA, the regulations made pursuant to the NSCA, or in the CNSC regulatory document REGDOC-3.6 *Glossary of CNSC Terminology*.

Approval – Commission’s permission to proceed, for situations or changes where the licensee would be:

- not compliant with a regulatory requirements set out in applicable laws and regulations;
- not compliant with a licence condition; and
- not in the safe direction but the objective of the licensing basis is met.

Boundary Conditions – procedural, administrative rules and operating limits for ensuring safe operation of the facility based on safety analyses and any applicable regulatory requirements.

Certified Staff – trained licensee staff, certified by the Commission as qualified to perform the duties of their respective roles.

Compliance Verification Criteria – regulatory criteria used by CNSC staff to verify compliance with the licence conditions.

Design Basis – the entire range of conditions for which the nuclear facility is designed, in accordance with established design criteria, and for which damage to the fuel and/or the release of radioactive material is kept within authorized limits.

Effective Date – the date that a given document becomes effective within the licensing period. The effective date is either set to the licence issue date or to a future date when the given document becomes effective.

Guidance – guidance in the LCH is non-mandatory information, including direction, on how to comply with the licence condition.

Important to Safety – items important to safety include, but are not limited to:

- (a) SSCs whose malfunction or failure could lead to undue radiation exposure of the facility/site personnel, or members of the public;
- (b) SSCs that prevent anticipated operational occurrences from leading to accident conditions;
- (c) those features that are provided to mitigate the consequences of malfunctions or failures of SSCs; and
- (d) tasks, duties, activities, aging mechanisms, findings, or any work that improperly performed could lead to radiation exposure of the facility/site personnel, or members of the public.

Program(s) – a documented group of planned activities, procedures, processes, standards and instructions coordinated to meet a specific purpose.

Qualified Staff – trained licensee staff, deemed competent and qualified to carry out tasks associated with their respective positions.

Safe Direction – changes in facility safety levels that would not result in:

- (a) a reduction in safety margins;

- (b) a breakdown of barrier;
- (c) an increase (in certain parameters) above accepted limits;
- (d) an increase in risk;
- (e) impairment(s) of safety systems;
- (f) an increase in the risk of radioactive releases or spills of hazardous substances;
- (g) injuries to workers or members of the public;
- (h) introduction of a new hazard;
- (i) reduction of the defence-in-depth provisions;
- (j) reducing the capability to control, cool and contain the reactor while retaining the adequacy thereof; or
- (k) causing hazards or risks different in nature or greater in probability or magnitude than those stated in the safety analysis of the nuclear facility.

Safety and Control Measures – measures or provisions which demonstrate that the applicant:

- (i) is qualified to carry on the licensed activities; and
- (ii) has made adequate provision for the protection of the environment, the health and safety of persons, the maintenance of national security and any measures required to implement international obligations to which Canada has agreed.

Written Notification – a physical or electronic communication between CNSC staff and a person authorized to act on behalf of the licensee.

2. ACRONYMS LIST

Acronym	Definition
AECL	Atomic Energy of Canada Limited
AL	Action Level
ALARA	As Low As Reasonably Achievable
CAF	Change Approval Form
CANDU	Canada Deuterium Uranium
CCR	Code Compliance Review
CNEA	Canadian National Energy Alliance
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
CVC	Compliance Verification Criteria
DDP	Detailed Decommissioning Plan
ERA	Environmental Risk Assessment
FFB	Facility Fire Brigade
FHA	Fire Hazard Assessment
FPP	Fire Protection Program
IAA	Impact Assessment Act
IAEA	International Atomic Energy Agency
IAP	Integrated Assessment Plan
LC	Licence Condition
LCH	Licence Conditions Handbook
NFPA	National Fire Protection Association
NSCA	<i>Nuclear Safety and Control Act</i>
PDD	Program Description Document
PRD	Program Requirements Document
PTNSR	<i>Packaging and Transport of Nuclear Substances Regulations, 2015</i>
REGDOC	Regulatory Document
RPR	Radiation Protection Regulations
SAT	Systematic Approach to Training
SCA	Safety and Control Area

SSC	Structures, Systems, Components
SWS	Storage with Surveillance
TDGR	<i>Transportation of Dangerous Goods Regulations</i>
WL	Whiteshell Laboratories

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