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THE CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Reviewing the Canadian Nuclear Laboratories Ltd.'s Application for the Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories (Ref. 2024-H-07)

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September 16, 2024

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Senior Tribunal Officer, Secretariat
Canadian Nuclear Safety Commission
280 Slater Street, P.O. Box 1046, Station B
Ottawa, Ontario K1P 5S9

Dear Sir or Madam:

Sent by email interventions@cnsc-ccsn.gc.ca

Re: Canadian Environmental Law Association's Submission Reviewing the Canadian Nuclear Laboratories Ltd.'s Application for the Renewal of the Nuclear Research and Test Establishment Decommissioning Licence for the Whiteshell Laboratories (Ref. 2024-H-07)

The Canadian Environmental Law Association ("CELA") has enclosed its comments, on Canadian Nuclear Laboratories Ltd.'s application to renew the decommissioning licence for the Whiteshell Laboratories for a period of 3-years.

Please find below our submission for your review.

By this letter, and pursuant to the CNSC's *Rules of Procedure*, CELA requests status to participate as an intervenor in the public hearing and an opportunity to make a 30-minute oral presentation at the October 2024 hearing.

Sincerely,

CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Sara Libman
Legal Counsel, CELA

INTRODUCTION

The Canadian Environmental Law Association (CELA) submits these comments in response to the Canadian Nuclear Safety Commission's (CNSC) Revised Public Notice dated April 12, 2024 requesting comments on the proposed licence renewal by Canadian Nuclear Laboratories (CNL) for a 3-year Nuclear Research and Test Establishment Decommissioning Licence for its Whiteshell Laboratories (WL) site. A virtual hearing for this matter is scheduled for October 23-24, 2024.

INTEREST AND EXPERTISE OF THE INTERVENOR

CELA is a non-profit, public interest law organization. CELA is funded by Legal Aid Ontario as a speciality legal clinic to provide equitable access to justice to those otherwise unable to afford representation for environmental injustices. For nearly 50 years, CELA has used legal tools to advance the public interest, through advocacy and law reform, in order to increase environmental protection and safeguard communities across Canada. CELA has been involved in number of nuclear facility licensing and regulatory matters before the CNSC.

CELA has an extensive library of materials related to Canada's nuclear sector which is publicly available on our website.[1] CELA has previously commented on matters related to Whiteshell Laboratories, including CNL's request for a one-year licence extension in 2018, the federal environmental assessment for the proposed in situ decommissioning of the Whiteshell reactor, and CNL's request for a 10-year licence extension in 2019.[2]

Supporting this intervention is expert Dr. Ian Fairlie, who CELA has retained to provide advice on human health issues associated with the existing Whiteshell Laboratories site within the context of CNL's licence renewal application.

BACKGROUND

A. Project Summary

The current CNL Licence for Whiteshell Laboratories, which expires December 31, 2024, authorizes CNL to conduct decommissioning activities at the site's facilities. The Whiteshell site is composed of a range of nuclear facilities, including radioactive waste management facilities, research laboratories and support buildings. CNL is requesting to renew its Nuclear Research and

[1] Canadian Environmental Law Association, online: www.cela.ca

[2] *See* online: *Licence extension 2018:* https://cela.ca/wp-content/uploads/2019/07/1189-OneYearWhiteshellReactorLicenceRenewal.pdf; *Draft EIS*: https://cela.ca/wp-content/uploads/2019/07/1154-CELACommentsOnTheDraftEIS.pdf; and *Licence extension 2019:* https://cela.ca/wp-content/uploads/2019/09/1292-Submission-from-CELA-Regarding-CNLs-Whiteshell-Laboratories-Licence-Renewal-Ref-2019-H-03.pdf

Test Establishment and Decommissioning licence for a 3-year period, during which to continue conducting decommissioning activities.[3]

Since 2002, when the WL decommissioning licence was first issued by the CNSC, decommissioning has consisted of activities such as:

- 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.[4]

With the current decommissioning licence expiring December 31, 2024, CNL is seeking a 3-year renewal period, with no requests to change the terms, conditions, or licensed activities from the current decommissioning licence.[5]

B. Scope of Review

CELA received participant funding to review CNL's licence application and related documentation, including CNL and CNSC Commission member documents, with a focus on the environment and human health, best practices for environmental protection and sustainable development, and relevant international guidance. Therefore, this intervention considers the CNSC's jurisdiction per the *Nuclear Safety and Control Act* (NSCA) to ensure the adequate protection of the environmental and human health.[6] In meeting this objective, per s 24(4) of the *NSCA*, CELA has compiled its findings from its review of CNSC Staff and CNL Commission Member Documents (CMDs) and accompanying references, and has provided recommendations, suggested licence and licence condition revisions to the CNSC, to assist in its public interest and environmental review of the Whiteshell Laboratories site.

Within this review, CELA has considered the extent to which the CNSC, enabled by section 24(4) of the *NSCA* has incorporated principles of international environmental law, such as the

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[3] Canadian Nuclear Safety Commission, Revised Notice of Public Hearing and Participant Funding; Ref. 2024-H-07 (Ottawa: CNSC, April 12, 2024).
[4] CNSC, "Canadian Nuclear Laboratories Ltd., Whiteshell Laboratories Commission Public Hearing", CMD 24-H7 (Ottawa: CNSC, July 18, 2024) at p 3 [**CNSC CMD**].
[5] *Ibid* at p 6.
[6] *Nuclear Safety and Control Act,* SC 1997, c 9

precautionary principle, into its licensing application review. We also draw on international benchmarks and precedents, where relevant.

The analysis within this submission is broken down into two parts. **Part 1** of this submission reviews the regulatory frameworks, issues of non-compliance and regulatory oversight issues impacting the decommissioning of WL. **Part 2** provides a focus on the human health impacts linked to environmental radioactivity.

Our recommendations, including suggested licence and licence condition revisions are summarized in **Appendix A.**

FINDINGS PART 1: REVIEW OF REGULATORY FRAMEWORKS

A. Concerns Surrounding SCA Non-compliance

CELA is deeply concerned by CNL's downplaying of the non-compliance issues which have occurred at WL over the course of this 5-year licence period, with statements such as "subject to CNSC approval through the issuance of the requested Licence, CNL will continue with activities for the WLRP, demonstrating strong, compliant licence performance while continuing with the important site decommissioning and environmental remediation work" within CNL's submission.[7]

As highlighted in the Regulatory Oversight Report CNL 2022,[8] there have been serious concerns surrounding non-compliance at Whiteshell—as CELA had noted, every single inspection revealed non-compliant areas except baseline radiation at Whiteshell.[9] As a result of CNL disclosing serious deficiencies in fire and emergency training, and in equipment inspection, lack of testing and maintenance and use of incomplete or expired personal protective equipment—which were identified through CNL's self-assessment—Whiteshell was placed into a safe shutdown state during the years of 2020, 2021, and 2022.[10]

Following the site safety stand-down in 2022, CNL undertook numerous corrective actions through a WL recovery plan, with. Fieldwork resuming in December 2022. Following a reactive Human Performance Management Safety and Control Area (SCA) focused inspection at WL, the CNSC revealed 4 Notices of Non-Compliance (NNCs) related to outdated training documentation and

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[7] Canadian Nuclear Laboratories, "Written Submission from Canadian Nuclear Laboratories Ltd. in the Matter of Whiteshell Laboratories," CMD 24-H7.1 (July 17, 2024) , p. 55 [**CNL CMD**]

[8] CNSC, "Regulatory Oversight Report for Canadian Nuclear Laboratories Sites: 2022", CMD 23-M30 (August 2, 2023), online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD23-M30.pdf/object

[9] CELA, "Re: Regulatory Oversight Report CNL 2022 Reference # 2023-M-30" (October 2, 2023), online: https://cela.ca/wp-content/uploads/2023/11/CELA-comments-re-CNL-ROR-Oct-1-2023.pdf, p 1 [**CELA ROR submission**].

[10] *Ibid* at p 3.

requirements, inaccurate training records, limited access to training records by supervisors, and inconsistent training program evaluation.[11]

In the CNSC's CMD for this licence renewal application, there is a general assessment of SCA performance at WL. As we discuss below, there are a number of concerns arising from several SCAs, suggesting that the management of Whiteshell is not under control.

i. Management System

The Management System SCA is concerned with the processes and programs in place to ensure that an organization achieves its: "…safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture."[12] From 2019-2023, Whiteshell received a compliance rating of "SA" as being satisfactory. CNSC staff note that "during the current licencing period, CNL has implemented and maintained a management system at the WL site."[13] We submit that with the deeply concerning instances of non-compliance at WL, and as Dr. Ian Fairlie's analysis in **Part 2** of this submission will further explain, CNL has not fostered a healthy safety culture—these ratings of "SA" are inappropriate.

As a result of poor management practices at WL, CNSC staff have recommended an additional licence condition under the Management System SCA,[14] which will be discussed further in this submission in our commentary on proposed changes to Licence Conditions.

ii. Human Performance

In 2023, WL received a compliance rating of "BE" (Below Expectations) for the Human Performance Management SCA, which consists of human performance program; personnel training; and fitness for duty.[15] According to the CNSC CMD, "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."[16]

Having qualified workers properly trained, and adhering to protocols and programs is essential for ensuring that operations at WL are being run safely and responsibly (see more on this issue in **Part 2** of this submission). With the systematic approach to training (SAT) listed positions at WL not

[11] CNSC CMD, at p 10.
[12] CNSC CMD, at p 17.
[13] *Ibid,* at p 18.
[14] *Ibid,* at p 21.
[15] *Ibid,* at p 22.
[16] *Ibid.*

meeting the expectations and directions in training management system documents or external regulations and requirements, WL has failed to adhere to the framework endorsed by the CNSC for establishing and maintaining training for persons working in a nuclear facility.[17] CELA is concerned about the deficiencies in the SAT for Whiteshell, and how this deficiency only came to light through self-inspection, and not through CNSC inspections, making the previous Human Performance SCA ratings of "SA" not be an accurate reflection of how CNL has been managing personnel performance at WL during this licencing period.

The CNSC CMD also indicates that in 2019, there was 1 NNC issued related to personnel training (this information is confidential, and therefore the intervenor is not able to consider the details of this NNC). This NNC was deemed to be of "low risk to safety." Additionally, a reactive inspection by the CNSC in December 2023 resulted in 4 NNCs being issued related to "…outdated training documentation and requirements, inaccurate training records, limited access to training records by supervisors, and inconsistent training program evaluation."[18] With numerous NNCs being issued during this 5-year licence term, the intervenor is concerned that the severity of not-complying with the Human Performance SCA is not being taken seriously by CNL, which can ultimately lead to complacency and unsafe work practices at WL, and therefore potential harms to human and environmental health.

This concern is further exacerbated by the fact that CNSC staff have indicated a direct violation of paragraph 12(1)(a) of the *General Nuclear Safety and Control Regulations* (*GNSCR*)[19]:

> 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.[20]

Despite these concerns, CNSC staff have determined that the risk to the health or safety of persons or impact on the environment as low, and that CNL is qualified to carry out the authorized activities at WL under this SCA.[21] The intervenor notes that increased inspections and oversight by the CNSC will be needed to ensure that Human Performance does not recede back into below

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[17] *Ibid,* at p 23.
[18] *Ibid*, at p 25.
[19] SOR/2000-202.
[20] CNSC CMD at p 27, *emphasis added.*
[21] *Ibid* at p 28.

expectations ratings after enough time has elapsed since CNL rectified deficiencies associated with this SCA. We submit that violation of *GNSCR* calls for deeper oversight and monitoring of CNL and its Whiteshell Laboratories site—beyond the requirement of additional reports. A direct violation of licensee obligations under the GNSCR does not evoke the public's confidence that there is adequate safety measures in place—especially with regard to having a sufficient number of qualified fire response workers. With these deficiencies and issues of non-compliance only arising through the proponent's self-reporting, there needs to be adequate oversight from the CNSC to ensure that there is not an under-representation of non-compliance due to non-disclosure.

As suggested within our submission for the CNL ROR, we recommend that the CNSC Commission members delve into better understanding of the CNSC regulatory oversight role, or lack thereof, whereby this situation at Whiteshell managed to get to the state that it did on the very matters that are most critically important to the public and the environment. It bespeaks a lack of on-site inspections, or lack of inspector competence, or lack of inspection rigour, if they did occur. It also undermines the credibility of the current oversight system.[22]

RECOMMENDATION NO. 1: CNSC Commission members need to delve into better understanding of the CNSC regulatory oversight role, or lack thereof, whereby this situation at Whiteshell managed to get to the state that it did on the very matters that are most critically important to the public and the environment.

iii. Operating Performance

This SCA is concerned with the conduct of licenced activity; procedures; and reporting and trending. While WL received "SA" ratings for this entire licence cycle, in 2023 there was a notable increase in the number of reportable events (15), compared to 2022 (3 reportable events).[23] CNSC staff note that "CNL began conducting root cause analysis actions which revealed additional program deficiencies qualifying as reportable to CNSC staff."[24]

Under the current licence, condition 3.2 requires CNL to submit annual reports on compliance monitoring and operating performance of facilities at the WL site. These reports have been reviewed by CNSC staff, with no significant regulatory issues being identified during the review.[25] According to the event initial report (EIR) "EIR: Safety stand-down at Canadian Nuclear Laboratories' Whiteshell Site following the discovery of non-compliances in the fire protection program", which was presented to the Commission on June 8, 2023:

[22] CELA ROR submission at p 4.
[23] *Ibid* at p 32.
[24] *Ibid.*
[25] *Ibid.*

> CNSC staff conducted a site visit to WL on May 30, 2023. The purpose of this visit was to determine if CNL has in place a safe, effective and sustainable fire response and adequate implementation of compensatory measures to address the fire protection system non-compliances and ensure the protection of all workers, responders, facilities, and the environment.[26]

The intervenor seeks clarification on how frequently CNSC staff conduct site visits and on-site inspections of WL, especially considering that 2023 saw 15 reportable events associated with the site. What justifies a site visit?

RECOMMENDATION NO. 2: The Commission should seek clarification on how frequently CNSC staff conduct site visits and on-site inspections of Whiteshell, and what justifies a site visit?

iv. Environmental Protection

The Environmental Protection SCA considers radioactive nuclear and hazardous wastes and their effects on the environment, and takes into account: Environmental risk assessment; effluent and emissions control (releases); assessment and monitoring; protection of people; and environmental management system (EMS).[27] During this licensing cycle, WL received "SA" ratings for Environmental Protection, however it is important to note that "…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."[28]

As a result, intervenors and members of the public are unable to read and review the most recent environmental protection data prior to the public hearing, as "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 thee submitted CNL reports."[29] We submit that in order to provide transparent and accurate data on environmental protection, and the potential releases of nuclear and hazardous waste into the environment, participation submission dates and/or scheduled hearing dates should take into account the licencing condition deadlines for a proponent to provide reports to the CNSC. While WL was compliant with this SCA according to 2023 data, the public cannot comment on any potential releases that may have occurred in 2024.

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[26] CNSC, *EIR: Safety stand-down at Canadian Nuclear Laboratories' Whiteshell Site following the discovery of non-compliances in the fire protection program*, CMD 23-M25 (June 22, 2023), online: https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD23-M25.pdf/object?subscription-key=3ff0910c6c54489abc34bc5b7d773be0 at p 3.
[27] CNSC CMD at p 53.
[28] *Ibid,* at p 54.
[29] *Ibid.*

Under REGDOC 2.9.1 *Environmental Principles, Assessment and Protection Measures* and CSA N288.6-1, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills,* CNL is required to establish and maintain an Environmental Risk Assessment (ERA) for WL, which 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."[30]

CNL submitted the WL site-wide ERA on May 31, 2023, and "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."[31] Having access to Whiteshell's ERA would have been valuable to Dr. Fairlie's expert analysis. Since no timeline was disclosed for when exactly the revised ERA, when we requested a copy of the updated ERA from CNL, we were provided with ERA revision version 0, dated May 31, 2023.

In previous submissions to the CNSC, CELA has emphasized that all relevant documents in possession of either the CNSC or a nuclear project proponent—as long as it does not compromise security or confidential information—should be made publicly available when they become available. We submit that the ERA dated May 31, 2023 should have been released along with the CMDs back in July. When it became clear that reviewing this document referenced in the CNSC CMD would be beneficial to CELA's submissions, we needed to request a copy, and await for it to be disclosed. We received a 700+ page document, with not enough time to thoroughly review it. We submit that when all referenced documents are provided in advance of preparing comments for licencing hearings, members of the public have a better opportunity to adequately review and understand the issues surrounding a licence renewal application.

We reiterated that under the *NCSA*, the CNSC has an obligation to disseminate objective scientific, technical and regulatory information to the public.[32] We submit that to effectively disseminate this information to the public, it must be easily and readily accessible, and not be hidden behind information requests. Therefore, to increase transparency and accessibility, CELA recommends that all documents and reports related to WL—without compromising security—should be publicly available and posted online on CNL's designated Whiteshell website.

In regards to reportable events under the Environmental Protection SCA, there were 2 reportable events during the current licence cycle, including an incident in which the process outfall effluent exceeded the WL action level for Manganese. This exceedance "was caused by run-off of sediment

[30] *Ibid* at p 56.
[31] *Ibid* at p 57.
[32] NSCA, s 21(1)(e)

on roadways which were not cleaned where soil in the area normally has elevated levels of Manganese."[33] According to CNSC staff, after CNL took corrective action, CNSC staff were "satisfied with CNL's corrective actions after follow-ups and desktop reviews."[34] The intervenor submits when an environmental release occurs at a site like Whiteshell, follow-ups by CNSC staff ought to be in person, rather than by desktop to ensure the clean-up campaign is satisfactory, and that preventative measures are communicated and practiced on site to prevent repeat incidents.

RECOMMENDATION NO. 3: The scheduling of public hearing dates and the respective submission deadlines should take into account licence condition deadlines for a proponent to submit reports to the CNSC. This ensures that the public have access to the most updated and accurate information on compliance with SCAs, such as the Environmental Protection SCA.

RECOMMENDATION NO. 4: All documents and reports related to WL—without compromising security—should be publicly available and posted online on CNL's designated Whiteshell website.

RECOMMENDATION NO. 5: When an environmental release occurs at a site like Whiteshell, follow-ups by CNSC staff ought to be in person, rather than by desktop to ensure the clean-up campaign is satisfactory, and that preventative measures are communicated and practiced on site to prevent repeat incidents.

v. Emergency Management and Fire Protection

The Emergency Management and Fire Protection SCA is concerned with the emergency plans and emergency preparedness programs that exist for emergencies and non-routine conditions.[35] During this licence period, there has been deeply concerning instances of non-compliance with this SCA, resulting in a compliance rating of "BE" for 2022 and 2023. With CNL's self-assessment of its fire protection program at WL, serious regulatory deficiencies in the training records for the on-site fire brigade and incomplete equipment procedures were discovered, resulting in a shutdown of non-essential activities.[36]

With CNL failing to meet regulatory requirements for its fire protection program, CNSC staff have developed a WL-focused compliance verification plan, with added regulatory scrutiny. This WL-focused compliance verification plan includes:

- Increased scope and/or frequency of inspections,
- Increased reporting requirements,

[33] CNSC CMD at p 60.
[34] *Ibid*.
[35] *Ibid* at p 63.
[36] *Ibid* at p 65-66.

- Increased frequency of meetings between CNSC staff and the licensee,
- Additional document reviews.[37]

This increased scrutiny of the WL site is welcomed by the intervenor, as emergency planning is not something to be taken lightly at any stage of a nuclear site's operations (including one undergoing decommissioning). That being said, we seek clarification and further details on this plan. For instance, rather than "increased scope and/or frequency of inspections", we submit that this should be an "and" parameter, rather than an "and/or" parameter. Increasing the number of inspections, as well as their scope, would improve the regulatory oversight of WL. Additionally, we suggest that most, if not all, inspections of WL under this plan be in person. On-site inspections on a more frequent basis would provide a more thorough look at the site's operations, and would also encourage CNL staff on-site to carefully follow protocols to avoid CNSC staff scrutiny.

Additionally, with increased reporting requirements, we proposed that reports (unless subject to confidential and security-related information) be disclosed to the public in a timely manner, especially prior to any public-commenting periods related to the WL-site licence.

RECOMMENDATION NO. 6: To ensure the WL-focused compliance verification plan is a robust regulatory oversight mechanism, there must be an increase in the scope and frequency of inspections. Most, if not all, inspections of WL under this plan be in person. On-site inspections on a more frequent basis would provide a more thorough look at the site's operations, and would also encourage CNL staff on-site to carefully follow protocols to avoid CNSC staff scrutiny.

RECOMMENDATION NO. 7: Any required reports (unless subject to confidential and security-related information) need to be disclosed to the public in a timely manner, especially prior to any public-commenting periods related to the WL-site licence.

vi. Security

The Security SCA is concerned with the security programs for facilities and equipment; response arrangements; security practices; and drills and exercises at the WL site.[38] From 2019-2021, WL received a compliance rating of "BE". The issue of non-compliance with the Security SCA had carried over from the previous licensing term, with corrective actions only bringing WL up to compliance in 2022 and 2023:

> 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

[37] *Ibid* at p 66.
[38] *Ibid* at p 73.

> demonstrate that WL is capable of making an effective intervention to stop an adversary from committing theft or sabotage.
>
> Subsequently, the security program at WL was assessed BE in the 2018, 2019, 2020 and 2021 calendar years.[39]

An on-site inspection in 2021 identified "significant deficiencies in the implementation of the security program…the non-compliances were related to the accessibility of special equipment and the training of [tiered response force] (TRF) personnel."[40] According to CNSC staff, these deficiencies did not pose any immediate risk to the security of nuclear substances at WL.

In August 2023, CNSC staff conducted a focused inspection to assess CNL's compliance with the regulatory requirements. During this inspection, CNL identified non-compliance related to access to the protected area, "more specifically a mid-point review that had not been completed for 1 CNL employee."[41]

While these NNCs have been rectified and closed, they highlight the issue of worker non-compliance and complacency at a site undergoing decommissioning. Thankfully, none of these instances of non-compliance were deemed as immediate threats risks to security. However, the numerous instances of non-compliance with the Security SCA lead the public to believe that safety and security measures are not taken seriously at this site undergoing decommissioning. It also brings the CNSC's ability to fulfill its regulatory oversight duties into question, as Whiteshell seems to have created a grocery-list of non-compliance issues. Because most security-related reports and documents are typically confidential, the public heavily relies on the CNSC to monitor, regulate, and enforce the *NSCA* at sites like WL to ensure they remain safe and secure.

B. Licence Conditions Need to Reflect Shortfalls in Safety Procedures

The previous section of our submission highlighted numerous SCA deficiencies that have arisen over the course WL's 5-year licence period. Despite these deficiencies, CNSC staff have deemed CNL's operations at WL to be satisfactory to have the decommissioning licence renewed for a period of 3-years, with the addition of Licence conditions. CELA is relieved to see that CNSC staff are recommending the addition of Licence conditions to scrutinize compliance, especially to improve compliance with the Emergency Management and Fire Protection, and Human Performance Management SCAs.[42]

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[39] *Ibid* at p 73, *emphasis added*.
[40] *Ibid* at p 75.
[41] *Ibid* at p 76.
[42] *Ibid* at p 98.

According to the List of Inspections table at Appendix E of the CNSC CMD, there were 17 inspections at WL during this licence period.[43] With the high-level summary of inspections on this table, it is unknown which inspections were conducted remotely or in person, and it reveals an inconsistent number of inspections per year with not every SCA being inspected each year. The intervenor acknowledges that there is an absence/reduction in inspections in 2020-2021 due to restrictions during the height of the COVID-19 pandemic. That being said, with restrictions lessening in 2022 and onwards, the intervenor maintains that the inspection of SCAs at Whiteshell ought to be more stringent. For example, during this licence cycle, the Environmental Protection SCA was only inspected once (March 21-23, 2023); and the Security SCA was last inspected in 2022.

With CNSC staff recommending conditions to the Licence Conditions for WL to increase regulatory scrutiny, the intervenor submits the proposed conditions should include parameters for an increase in on-site inspections for all SCAs, especially for those SCAs with repeated instances of non-compliance (e.g., the Emergency Management and Fire Protection SCA, the Security SCA, and the Human Performance SCA).

For example, under the SCA - Management System, CNSC staff have recommended Licence Condition 1.2: Integrated Assessment Plan Reporting Requirements, which 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.[44]

The intervenor approves of the increased requirement for CNL to report to the Commission on the progress on its integrated assessment plan, as requiring the proponent to be in communication with the Commission on its efforts is important in holding CNL accountable with its obligations. The intervenors note that in order to truly ensure there is adequate management of the WL site, the CNSC needs to not only review reports prepared by CNL; it needs to conduct inspections on its own terms to ensure there is regulatory compliance beyond what the proponent writes down on paper. Therefore, we recommend the addition of a licence condition for each SCA that the licensee shall be subject to at least one on-site inspection per year.

Under the SCA - Safety Analysis section of the Proposed Licence Conditions, CNSC staff have proposed the addition of 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

[43] CNSC CMD, Appendix E at p 131.
[44] CNSC CMD, Proposed Licence Changes at p 135.

> 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.[45]

The addition of this Licence Condition is welcomed, as CELA is of the opinion that the Safety Analysis SCA needs to be carefully scrutinized (especially with consideration of Dr. Fairlie's assessment **Part 2** of this submission), given the non-compliance issues suggesting an unsafe work practices culture at WL. However, we are of the opinion that the timeline of 5-years is too infrequent, especially considering that this licence renewal is being recommended for a 3-year period by CNSC staff. For this analysis report to be reviewed and revised on a 5-year basis means that this report will not be reviewed before the next licence renewal period for the WL-site decommissioning licence. As a result, the public would not have access to information on the progress on the safety analysis report at the next public hearing.

CELA submits that this proposed Licence Condition should align with the licensing period. For instance, if this licence is renewed for a period of 3-years, then proposed Condition 4.1 should have a deadline of 3-years. This would ensure that the public are provided with an update on this condition during public hearings for renewing WL's licence. That being said, we are of the opinion that this condition should have a deadline of 1-year, as we will discuss below that this licence should be valid for a period of 1-year.

RECOMMENDATION NO. 8: To ensure WL is thoroughly monitored during the next licencing cycle, there should be licencing conditions for each SCA to include parameters for an increase in on-site inspections for all SCAs, especially for those SCAs with repeated instances of non-compliance (e.g., the Emergency Management and Fire Protection SCA, the Security SCA, and the Human Performance SCA).

> For instance, each SCA section of the Licence Conditions should require that the licensee shall be subject to at least one on-site inspection per year.

RECOMMENDATION NO. 9: Proposed Licence Condition 4.1 should reflect the length of the licence term. For example, if the licence is renewed for a period of 3-years, then condition 4.1 should have a deadline of every 3-years. Preferably, this condition should be subject to every 1-year.

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[45] *Ibid* at p 137, *emphasis added*.

C. Length of Licence should be 1-Year Rather than 3-Years

As stated under the Proposed Licence Changes section of the CNSC CMD,

> 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.[46]

Unlike the previous licensing hearing period, where CNL sought a 10-year licence term (and was granted a 5-year licence period), this renewal application is for a shorter term of 5-years, due to the plethora of non-compliant incidents at Whiteshell during the 5-year term.

In 2019, CELA had emphasized adhering to the precautionary principle in licensing hearings. An international law principle, the precautionary principle, which was adopted into Canadian law by the Supreme Court of Canada in *Spraytech*.[47] In *Spraytech*, the Supreme Court of Canada adopted the following definition of the "precautionary principle" from the Bergen Ministerial Declaration on Sustainable Development (1990):

> In order to achieve sustainable development, policies must be based on the precautionary principle. Environmental measures must anticipate, prevent and attack the causes of environmental degradation. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.[48]

In order to ensure the Commission's decision-making aligns with the precautionary principle, it should not grant the licensing period for Whiteshell to span 3-years when this site has had such a large number of regulatory violations in the span of 5-years.

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[46] *Ibid* at p 139.
[47] *114957 Canada Ltée (Spraytech, Société d'arrosage) v. Hudson (Town),* [2001] 2 SCR 241 at paras 30 – 32.
[48] *Ibid.*

In circumstances of potentially serious or irreversible environmental harm,[49] the CNSC must only licence decommissioning activities which prioritize environmental protection, and human health and safety. The close monitoring of WL is key to ensure compliance does not fall to the wayside; the intervenor submits the CNSC must uphold its regulatory oversight obligations, and regularly inspect the operations and updates at Whiteshell. We submit the best way to do so is to grant the WL site decommissioning licence for a period of 1-year. Having an annual review of the licence would be the most thorough form of regulatory oversight for Whiteshell, having a more frequent review of compliance.

Under the current licence period of 5-years, certain SCA violations spanned over a period of 3-years. Therefore, granting a licence period of 3-years provides a similar window for possible issues with regulatory compliance.

Furthermore, with CNSC staff stating that "CNSC staff will be monitoring the transition period for CNL and its resulting performance with new executive management before allowing a longer licensing period," we submit the recent history of WL's regulatory non-compliance indicates CNL should not be granted a licence for a period longer than 5-years, let alone 3-years. Following the precautionary principle would encourage closer monitoring of WL as it undergoes a new contract model. Revisiting the licence 1-year later in a public forum allows for a thorough analysis of what is and is not working with the decommissioning of Whiteshell, and provides a frequent check-in on safe practices to protect the health of humans and the integrity of the environment.

RECOMMENDATION NO. 10: The Commission must ensure its decision-making aligns with the precautionary principle and only licence decommissioning activities which prioritize environmental protection, and human health and safety.

RECOMMENDATION NO. 11: The licence for the Whiteshell Laboratories site should be renewed for a period no longer than 1-year.

D. Public Disclosure and Document Transparency

At the last licencing renewal hearing for the WL site decommissioning licence, we objected to the CNSC's continued reliance on CSA standards, as these standards insufficient from a public disclosure and accessibility perspective. As the preamble in the draft Licence Conditions Handbook (LCH) states:

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[49] European Environment Agency, Late Lessons from Early Warnings: The Precautionary Principle 1896-2000 (Copenhagen: EEA, 2002) at 13, 15; Nicolas de Sadeleer, "The Principles of Prevention and Precaution in International Law: Two Heads of the Same Coin?", chapter 9 in Research Handbook on International Environmental Law, Malgosia Fitzmaurice, David M. Ong and Panos Merkouris, eds (United Kingdom: Edward Elgar, 2014) at 184.

> Domestic and international standards (in particular consensus standards produced by the CSA Group) are an important component of the CNSC's regulatory framework.[50]

We noted that while it has also become common practice for the CNSC to mandate compliance with CSA N294-09, *Decommissioning of facilities containing nuclear substances*, and other CSA standards by adding a condition to the licences issued to major nuclear facilities, CSA standards are privately developed standards, which are not subject to the same level of public scrutiny as the legislative process for public laws and regulations.[51]

From our perspective, the CNSC's reliance on CSA standards inappropriately delegates the setting of regulatory standards to an industry body, not easily accessible by the public. Further, while recognizing that the individuals can request 'free' access to nuclear-related CSA standards, this gratuitous setting lacks the functionality of paid memberships and subscriptions. Users who do not pay are not able to download the standards as PDFs, can only view in the CSA web-based document viewer and are prohibited from quoting or reproducing any parts of the text due to copyright.

Therefore, we reiterate our stance that the CNSC should cease reliance on CSA standards for any matters relevant to nuclear licensing, and instead conduct all standard setting and guidance with the CNSC's processes.

RECOMMENDATION NO. 12: The CNSC should cease reliance on CSA standards for any matters relevant to nuclear licensing, and instead conduct all standard setting and guidance with the CNSC's processes.

E. Environmental Protection Review Report

One of the documents enclosed within the CNSC CMD is the Environmental Protection Review Report (EPR) for Whiteshell Laboratories, dated July 2024. An EPR is mandated under the NSCA for all nuclear facilities, ensuring the protection of the environment and the health and safety of persons.[52] The 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…"[53]

Along with radiological hazardous emissions, the EPR report discusses the emissions of non-radiological hazardous emissions at Whiteshell. The EPR report states: "The main sources of non-

[50] CNSC CMD, Draft Licence Conditions Handbook, at p 1.
[51] CSA, "N294-09 (R2014) Decommissioning of facilities containing nuclear substances" (2014)
[52] CNSC CMD, Environmental Protection Review Report at p 1.
[53] *Ibid.*

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."[54] The emissions discussed in the EPR report include: nitrogen oxides, sulphur dioxide, carbon monoxide, total particulate matter (PM) [PM_{10} and $PM_{2.5}$] and Volatile organic compounds. The emissions from the period of 2016-2022 are presented in "Table 3.2: Total annual airborne non-radiological hazardous emissions from the WL site compared to NPRI reporting thresholds (2016 to 2022)."[55]

In 2022, the total particulate matter ($PM_{10 \& 2.5}$) emissions was 46.9 Mg/year, with the PM_{10} emissions being 11.97 Mg/year, and the $PM_{2.5}$ emissions being 1.21. The National Pollutant Release Inventory (NPRI) reporting thresholds for these emissions are 20 Mg/year; 0.5Mg/year; and 0.3Mg/year, respectively.[56] These levels of particulate matter are quite high in comparison to previous years. Despite these exceedances, there is very little discussion of these emissions, beyond stating "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."[57]

The EPR Report does not discuss whether there are preventative measures in place to reduce the total particulate emissions during decommissioning activities, or how CNL intends to address these emissions. We submit that the act of decommissioning and excavating a nuclear site does not justify the release of non-radiological hazardous emissions. We request an update on what CNL is doing to reduce the release of total particulate matter during decommissioning activities. We further submit that the CNSC needs to pay attention to the NPRI's report and its thresholds when monitoring sites such as Whiteshell. The particular activities associated with decommissioning may increase the risk of certain pollutant emissions. This does not however, exempt CNL from reducing and preventing these releases from happening.

RECOMMENDATION NO. 13: The act of decommissioning and excavating a nuclear site does not justify the release of non-radiological hazardous emissions. We request an update on what CNL is doing to reduce the release of total particulate matter during decommissioning activities.

RECOMMENDATION NO. 14: The CNSC needs to pay attention to the NPRI's report and its thresholds when monitoring sites such as Whiteshell.

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[54] *Ibid* at p 35.
[55] *Ibid.*
[56] *Ibid.*
[57] *Ibid.*

FINDINGS PART 2: EXPERT REVIEW PREPARED BY DR. IAN FAIRLIE

Consultant on Environmental Radioactivity
Dr Ian Fairlie
115 Riversdale Road
London, UK

Re: CNL Application for Licence Renewal of its Decommissioning Program at Whiteshell Laboratories.

Revised September 15, 2024

1. I have been requested to submit comments on the 2024 Application by Canadian Nuclear Laboratories for Licence Renewal of its Decommissioning Program at Whiteshell Laboratories, Manitoba.

2. I am a Canadian citizen residing in London UK. I have university degrees in chemistry and radiation biology and my PhD at Imperial College in London was on nuclear waste policies. I was Chief Scientific Advisor to the British Government's Committee on the Radiation Risks of Internal Emitters (CERRIE) from 1999 to 2005. I have extensive experience in, and many publications on, radioactive waste issues. I continue to act as a consultant to NGOs and Governments. (My CV and list of publications can be supplied if necessary.)

3. I recognize the contributions of all First Nations, Métis, and Inuit peoples to making our Canada. I acknowledge and respect their histories, rights, and titles to the lands currently occupied by Whiteshell Laboratories.

4. I have been asked to focus on existing and looming human health issues at the present site.

Introduction and Background

5. Whiteshell Laboratories (WL) is a nuclear research and test establishment developed in the early 1960s by AECL to investigate high temperature versions of CANDU nuclear reactors. (A list of acronyms is provided at the end.) In the late 1990s after many accidents, AECL discontinued its research programs and operations at the facility. The site is still owned by AECL, but is operated by CNL under a GoCo arrangement.

6. The major structures at Whiteshell include the nuclear reactor WR-1 which was shut-down in 1985, a research building, and supporting buildings. The waste management area (WMA) for storing LLW and ILW includes

- LLW storage bunkers
- LLW unlined earth trenches
- LLW/ILW storage bunkers
- ILW in-ground concrete bunkers
- HLW/ILW in-ground concrete standpipes
- liquid waste storage tanks, and
- 15 concrete canisters for the dry storage of spent nuclear fuel.

7. WL's first license to decommission was issued in 2002, renewed in 2008 and amended in 2016. In 2014, the licence was transferred to CNL which became the licensee. The licence was renewed in 2018 and 2019 and is currently valid until December 31, 2024.

8. For the next licence period, CNL is proposing to decommission the WR-1 reactor using *in situ* decommissioning, which has not been approved by CNSC to date. If this were permitted, it would entail removing the above-surface reactor structure, then grouting all the below-surface components using concrete grout. The contents would then be capped with concrete and covered with a soil barrier. *In situ* decommissioning would be intended to isolate the reactor vault and its contaminated systems and components inside the below-surface structure. This controversial proposal is expressly not approved by the IAEA for intermediate level waste.

9. For Whiteshell's on-site radioactive wastes, CNL is planning to

- transport some LLW and ILW to Chalk River Laboratories (CRL)
- transport used nuclear fuel to CRL to be stored, and
- dispose of most of the LLW that resides in unlined soil trenches in the waste management area *in situ*

10. On November 21 2023, CNL submitted an application (https://api.cnsc-ccsn.gc.ca/dms/digital-medias/CMD24-H7-1.pdf/object) to the CNSC for the renewal of the Nuclear Research and Test Establishment Decommissioning Licence for Whiteshell Laboratories. This application is for Whiteshell's site-wide license, and not for the environmental assessment of the *in situ* nuclear waste proposals.

11. After 2 months' oral consultation with the CNSC, CNL's application was amended on February 15, 2024 (https://www.cnl.ca/wp-content/uploads/WLD-CNNO-24-0010-L_WL-Licence-Renewal-Application.pdf) to include

(a) excerpts from the Nuclear Safety and Control Act 1997 and relevant CNSC Regulations, and
(b) statements on how CNL intended to meet these requirements using the verification criteria prescribed by CNSC in the WL Licence Conditions Handbook.

12. The proposed term for the renewed site Licence would be three-years, commencing January 1, 2025.

Comments

A. CNL Reports yet to be received

13. In several areas, relevant CNL reports have not been made public or received by CELA before this submission. These include

- table 5 (last four rows) states that four inspection reports for 2024 are "*forthcoming*". These include a report on Emergency Management and Fire Protection. (see pp 64, 65 of CMD 24-H7.1)
- the penultimate line of page 95 states ***"****Canadian Nuclear Laboratories submitted a site-wide Environmental Risk Assessment to CNSC staff in 2023, to be compliant with CSA N288.6-12, Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills [38]. Comments were received from CNSC staff and CNL is in the process of dispositioning comments, with the expectation to have the revised Environmental Risk Assessment resubmitted to CNSC staff for acceptance* ***prior to the licence hearing."*** This 740 page report was in fact only made available a few days before the cut-off date for these comments. (see pages 96 and 97 of CMD 34 H7.1)
- the further report from CNL which is expected shortly on the series of safety shortcomings self-reported to the Commission in 2023 and 2024. See paragraph 22 below. This is still unavailable.

14. We draw attention to this unsatisfactory lack of documentation and the untimely provision of CNL's lengthy ERA report. Of necessity, this note is incomplete and will need revision after CNL's site -wide ERA and other safety reports have been made available for comments.

B. Some Improvements

15. In its application, CNL stated during the current licence period, it had

- removed the Active Liquid Waste Treatment Centre,
- continued the characterization of the WR-1 reactor,
- demolished the Biomedical Laboratory facility,
- worked on converting a Storage facility to a Cask Loading facility.
- initiated waste recovery from LLW storage bunkers, and
- invested in equipment to support safe waste retrieval from ILW bunkers and standpipes.

These improvements to the clearing-up of the site are welcomed.

C. Recent Untoward Safety Events

16. On health and safety matters, CNL stated in its application that, during the present licence period, it had

- enhanced safety protocols for emergency management and fire protection
- implemented corrective actions to address compliance issues
- improved overall safety standards
- enhanced its capabilities in emergency management, including regular drills, staff training, and acquiring a new fire engine and wildfire truck.

17. At the same time, CNL admitted in its application that it had *"faced several challenges during the licence period, including health and safety considerations related to ...worker safety, and compliance setbacks in the Fire Protection Program. These challenges had led to a prolonged site shut-down period and three work stand-downs. These ....were necessary to ensure protection of the public, the environment, and staff."*

18. One of these stand-downs occurred in 2022 when, during routine maintenance "*a worker received a low voltage shock as a result of inadequate identification of hazards in the work environment".*

19. These stand-downs had in fact been noted in 2022 in CNSC's Regulatory Oversight Initial Report (Reference # 2023-M-30). Following a self-inspection by CNL, page 34 of the CNSC's Regulatory Oversight Initial report had disclosed the following defects during the years 2020, 2021, 2022

- "*serious deficiencies in fire and emergency training,*
- *serious deficiencies in equipment inspection,*
- *lack of testing of personal protective equipment*
- *lack of maintenance of personal protective equipment and*
- *use of incomplete or expired personal protective equipment."*

20. The result was that CNL had reported itself to the CNSC and had itself placed Whiteshell Laboratories in a shutdown state where only essential compliance and maintenance work could be carried out.

21. Even more seriously, CNSC's later full CMD -28 report (on page 34) presented to the Commission on June 29, 2023) added the following shortcomings

- "*unavailability of firewater pressure and flow*
- *unavailability of fire hydrants*
- *non-maintenance of fixed suppression systems (sprinklers)*
- *non-testing of fixed suppression systems, and*
- *non-testing of emergency lighting in buildings."*

22. The current situation, as far as is known, is that compliance activities related to the 2023 stand-down were not expected to be completed before the end of March 2024 when the CMD report was published. CNSC staff were reviewing CNL's submissions on these matters, including a proposed multi-phase re-start plan. Further updates are to be provided by CNSC staff at a later meeting. (See paras 13 and 14 above.)

D. CNL's plans for 2025-2027

23. CNL's plans for 2025-2027 include the following

- with AECL, the appointment of a new Director of Mission Assurance
- strong demonstration of regulatory performance
- effective nuclear safety culture improvements
- improvements to self and independent assessments
- improved satisfactory performance in all Safety Control Areas, and
- compliance programs to assess safety effectiveness over the short and long term.

24. However, apart from the appointment of a new Director of "Mission Assurance", the rest are, with respect, warm aspirations with few objective yardsticks. The creation of a new Directorship is most likely dependent on AECL's agreement on funding, and its title "Mission Assurance" is nebulous not to say meaningless: why not state Director of Health and Safety?

E. Whiteshell Laboratories Site-Wide Environmental Risk Assessment (ERA) Report

25. The 740 page ERA report was sent by CNL to the CNSC on May 30, 2023, however it was not made available to intervenors until September 12, 2024, four days before the cut-off date for comments. The 15-month delay is impolite and inconsiderate to intervenors.

26. The overall objective of the ERA was to assess human and ecological risks at WL, taking into consideration environmental monitoring data between 2014 and 2019. It was not intended to support remedial or decommissioning work at WL. Specific objectives were to evaluate risks to

human and ecological receptors from exposures to contaminants at the WL site; and to recommend further action to clarify identified risks and/or to reduce their uncertainties.

27. Due to time constraints, this analysis is restricted to the main human health risks at WL, i.e. to radiological and not chemical risks. The main findings of the site ERA were as follows

- the estimated radiation doses to the critical groups[58] at farms A and F near WL were 0.5 to 0.8% of the annual dose constraint[59] of 0.25 mSv/a and "considered negligible";
- for the critical group at management unit 3 (MU3) near WL, no radionuclides associated with nuclear operations were detected in soil, groundwater and surface water;
- also at MU3, Cs-137 was detected in sediment resulting in a dose of 0.01 mSv/a which was stated to be "negligible";
- for the critical group at management unit 5 (MU5) near WL, the estimated upper limit of the radiation dose for a harvester (eating wild mushrooms and berries, etc.) was 8.7 μSv/a = 8.7 micro Sv/a. This was stated to be "well below" the dose constraint of 0.25 mSv/a; and
- nuclear energy workers at WL were not assessed as their radiation exposures were monitored and doses controlled through a separate occupational program.

28. Overall, the report stated that there were no immediate risk management recommendations for the WL site. It recognized that additional monitoring may need to be completed in order to reduce uncertainties associated with the findings.

F. Comments re Whiteshell On-Site ERA Report

(a) **uncertainties**

29. In a preliminary view, the ERA's conclusions depend heavily on an extended series of dose estimates for various critical groups near WL. However the methodology used to arrive at these estimates is not described in any detail. This is a crucial omission as very large uncertainties can (and do) exist with these dose estimates which render them unreliable for decision-making purposes, including licensing.

30. To help understand this matter, below is a simplified explanation of how radiation doses to people living near WL are estimated in the ERA. This explanation is not stated in site ERA report although it should have been.

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[58] A critical group are those subsets of people at or near the site who are estimated to be at the most risk

[59] "dose constraint" is not defined in the ERA report. It was originally defined in ICRP Publication 60 (1990) as an individual dose to limit the options in optimising exposures, ie in ALARA. Its value is arbitrary but is usually a small fraction of the public dose limit.

31. First, environmental measurements are taken of radionuclide concentrations (in Bq per kg) in air, water, foodstuffs, soils, etc. Uncertainties exist here (as admitted in the ERA) so a simple computer model is used to determine mean or average values. Second, another computer model is used to determine the nuclide uptakes by humans from breathing contaminated air, from eating contaminated foods, from drinking contaminated water, and from direct radiation from nuclides in the soil and in the air. There are many uncertainties in such models as much depends on the (many) assumptions used to simplify them. Third, other models are then used to estimate the retention (i.e. excretion rates) of nuclides in humans. Fourth, yet another model is used to convert Bq amounts in humans to annual radiation doses in mSv. Large uncertainties can exist here as well, depending on the radionuclide under consideration.

32. What happens is that the median (or average) value from the first computer model is plugged into the second model, whose result is then put into the next model, etc., etc. until a final overall value is arrived at after the series of models are used. However uncertainties exist at every stage and in each model's answers: these uncertainties have to be multiplied (in most stages) together to arrive at a final overall value for the total uncertainty. This is not performed in the ERA report.

33. Between 1999 and 2004, the UK Government established a committee of experts (Committee on the Radiological Risks of Internal Emitters, CERRIE) to examine the matter of uncertainties in doses from such internal radionuclides. It concluded that they could be large and, in some cases, very large indeed. https://www.researchgate.net/publication/259763240_Report_of_the_Committee_Examining_Radiation_Risks_of_Internal_Emitters_CERRIE

(b) Tritium

34. A second problem with the ERA report is the short shrift it gives to tritium, H-3, the radioactive isotope of hydrogen which is the lightest element. This is problematic because tritium in its oxygenated form, HTO i.e. tritiated water, is by far the most commonly-experienced nuclide at WL. Indeed it is ubiquitous throughout WL whether one considers the soil, Winnipeg River, the reactor WR-1, and all biota including all flora and fauna and humans. However the ERA practically ignores tritium: this is unfortunate.

35. The main problem is tritium's official dosimetry used by the ERA which invariably results in miniscule estimated doses which are then labelled as "negligible". But tritium's official dosimetry is riddled with false assumptions, incorrect values, dubious assertions and ridiculously lax safety limits.

36. For example, tritium's dose conversion factor (which converts Bq to Sv) is by far the lowest among common radionuclides and this is unreasonable given tritium's properties in cells. In

another example, the official dosimetry ignores tritium's ability of move about in the environment quickly and easily. It also largely ignores organically bound tritium in foodstuffs and in humans. It also ignores the increasing evidence that its RBE (relative biological effectiveness- a measure of how dangerous it is) is at least double that used by Health Canada. And it ignores the strict tritium limits for tritium in drinking water used in overseas countries which are 100s or 1000's of times more strict than the limit used by Health Canada. See, for example, Tritium Hazard Report: Pollution and Radiation Risk from Canadian Nuclear Facilities. Published by Greenpeace Canada. June 2007. http://www.greenpeace.org/raw/content/canada/en/documents-and-links/publications/tritium-hazard-report-pollu.pdf

37. These two problems, dose uncertainty and tritium, are serious matters as together they render the scores of dose estimates in the ERA report unreliable for decision-making purposes, including relicensing.

G. Overall Conclusions (Preliminary)

38. In general terms, CMD-24 H7.1 reveals evidence that the safety situation at WL during the past 4 years has been poor, as numerous instances of bad safety practices existed. For example,

- table 5 (pages 64/65) shows that 51 Notices of Non-Compliance (NNCs) were filed - an average of more than one per month
- table 7 (page 66) shows that 1,739 Improvement Actions were filed – an average of more than one per day
- section 5.10.3 states that the fire preparedness system at WL was so poor that fire-response capability had to be brought in from CRL, and 30 new firefighters had to be hired. (see 5th para page 101)

39. From the above and several other similar statements, it is concluded that safety considerations do not appear to be paramount within CNL's management at Whiteshell Laboratories. Despite repetitive, tautological, verbose language to the contrary, the reality is that an unsatisfactory safety situation still exists at WL.

40. It is important to suggest how to improve the safety situation at WL. For example, lessons could be learned from overseas experience of management failures on safety matters. One recent example is the well-documented failure of the safety culture at the Boeing aircraft company in the US. See the discussion by an emeritus professor of occupational health and safety; https://aihs.org.au/Web/Web/Advocacy-Media/All-News/2024/03-March/How%20Boeing%E2%80%99s%20organisational%20failures%20contributed%20to%20737%20MAX%20crashes.aspx

41. The main fault found by Professor Hopkins of the Australian National University was that, prior to its 2016 partnership with McDonnell Douglas, Boeing alone had a world-renowned safety culture and no major air accidents. Following the partnership, many safety matters (policies, procedures, and features) were downgraded as being unnecessarily expensive. The eventual outcome was 2 fatal aircraft crashes and 2 subsequent near fatal accidents involving Boeing aircraft.

42. Of particular note is the publication in February 2024, of the expert panel's report of the US Government's regulator, the Federal Aviation Administration. This highlighted Boeing's present lack of a safety culture, its poor safety management system, and the disconnect between Boeing's senior management and other employees on safety matters.

43. Although substantial differences exist between Boeing and Whiteshell Laboratories, it can still be seen from the recent adverse experiences at Whiteshell that a safety culture is lacking at the site, certainly among most directors. It may be the case that certain WL employees were concerned about the lack of attention to safety matters (otherwise these mishaps would not have come to light). But, overall, it is indisputable that safety matters were allowed to deteriorate at WL in recent decades.

44. It is easy to conclude that a lack of safety culture exists at Whiteshell as the facts speak for themselves: WL is still in a stand-down state. The difficulty is remedying the matter, as once it is gone, a safety culture is hard to re-establish. Hard but not impossible.

45. Here are some lessons from Boeing and other examples that Commissioners could recommend, or require, in any future licence:

- CNL immediately to appoint a senior director who is a CNL Board member and whose sole responsibility is health and safety
- CNL to draw up a written policy on health and safety matters which places substantial emphases on finance to improve matters
- CNL to introduce a site safety committee chaired by a Board Director, which meets at least monthly
- CNL to introduce safety representatives among the workforce to be given paid time off work to attend to their safety functions, and to be protected from arbitrary discrimination, and
- CNL to incentivise safety among its directors.

46. In addition, it is recommended that Commissioners may wish to discuss CNSC's regulatory oversight role, or lack thereof, at nuclear facilities. This is because the poor situation at WL affects the public's credibility of CNSC's current oversight system. The poor situation has been widely

noticed – (for example Taylor D. “Nuclear dreams just aren’t coming true”. Winnipeg Free Press Sept 7, 2024).

47. The obvious question arises - why was the safety situation at WL not spotted much sooner? Other questions have been raised as to how this situation could have arisen on vital matters, especially fire prevention. These include queries on the lack of on-site inspections, and possible lack of inspector competence or rigour.

48. The CNSC’s credibility problem here was exacerbated in 2023 by its CMD-28 report (presented to the Commission on June 29, 2023) where the overall conclusion by CNSC staff was that CNL “*continued to implement and maintain effective emergency management fire protection programs at CNL sites in accordance with regulatory requirements, apart from at WL*.” This is an inappropriate conclusion in view of the outstanding areas of non-compliance at CRNL concerning fire and emergency response issues.

IF/Sept 15

Acronym	**Definition**
AECL	Atomic Energy of Canada Limited
ALARA	as low as reasonably achievable
ALWTC	Active Liquid Waste Treatment Centre
AOPFN	Algonquins of Pikwàkanagàn First Nation
CANDU	CANada Deuterium Uranium
CCSF	Concrete Canister Storage Facility
CMD	(CNSC) Commission Member Document
CNL	Canadian Nuclear Laboratories
CNSC	Canadian Nuclear Safety Commission
COPC	Contaminant of Potential Concern
CRL	Chalk River Laboratories
CSA	Canadian Standards Association
DDP	Detailed Decommissioning Plan
EIS	Environmental Impact Statement
ERA	Whiteshell Site-wide Environmental Risk Assessment
HLW	radioactive High-Level Waste
IAEA	International Atomic Energy Agency
ILW	radioactive Intermediate-Level Waste
ISO	International Standard Organization
LLW	radioactive Low-Level Waste
MMF	Manitoba Métis Federation
MU	management unit

NEW	Nuclear Energy Worker
REGDOC	CNSC Regulatory Document
WL	Whiteshell Laboratories
WLRP	Whiteshell Laboratories Restoration Project
WMA	Waste Management Area
WR-1	Whiteshell (Nuclear) Reactor – 1

RECOMMENDATION NO. 15: CNL immediately to appoint a senior director who is a CNL Board member and whose sole responsibility is health and safety.

RECOMMENDATION NO. 16: CNL to draw up a written policy on health and safety matters which places substantial emphases on finance to improve matters.

RECOMMENDATION NO. 17: CNL to introduce a site safety committee chaired by a Board Director, which meets at least monthly.

RECOMMENDATION NO. 18: CNL to introduce safety representatives among the workforce to be given paid time off work to attend to their safety functions, and to be protected from arbitrary discrimination.

RECOMMENDATION NO. 19: CNL to incentivise safety among its directors.

ORDER REQUESTED

For the foregoing reasons provided in this submission, we request the CNSC issue an order:

(1) Granting CELA the status of intervenor;

(2) Granting CELA the opportunity to make an oral presentation at the October 23-24, 2024 public hearing;

(3) Only approving the CNL licence renewal application for a period of one (1) year.

(4) In the alternative, approving the CNL licence renewal for a period of three (3) years, on the condition that any reporting obligations set out within the Licence Conditions Handbook not exceed a submission deadline of three years.

Sincerely,

CANADIAN ENVIRONMENTAL LAW ASSOCIATION

Sara Libman

Sara Libman
Legal Counsel

APPENDIX A - SUMMARY OF RECOMMENDATIONS

RECOMMENDATION NO. 1: CNSC Commission members need to delve into better understanding of the CNSC regulatory oversight role, or lack thereof, whereby this situation at Whiteshell managed to get to the state that it did on the very matters that are most critically important to the public and the environment.

RECOMMENDATION NO. 2: The Commission should seek clarification on how frequently CNSC staff conduct site visits and on-site inspections of Whiteshell, and what justifies a site visit?

RECOMMENDATION NO. 3: The scheduling of public hearing dates and the respective submission deadlines should take into account licence condition deadlines for a proponent to submit reports to the CNSC. This ensures that the public have access to the most updated and accurate information on compliance with SCAs, such as the Environmental Protection SCA.

RECOMMENDATION NO. 4: All documents and reports related to WL—without compromising security—should be publicly available and posted online on CNL's designated Whiteshell website.

RECOMMENDATION NO. 5: When an environmental release occurs at a site like Whiteshell, follow-ups by CNSC staff ought to be in person, rather than by desktop to ensure the clean-up campaign is satisfactory, and that preventative measures are communicated and practiced on site to prevent repeat incidents.

RECOMMENDATION NO. 6: To ensure the WL-focused compliance verification plan is a robust regulatory oversight mechanism, there must be an increase in the scope and frequency of inspections. Most, if not all, inspections of WL under this plan be in person. On-site inspections on a more frequent basis would provide a more thorough look at the site's operations, and would also encourage CNL staff on-site to carefully follow protocols to avoid CNSC staff scrutiny.

RECOMMENDATION NO. 7: Any required reports (unless subject to confidential and security-related information) need to be disclosed to the public in a timely manner, especially prior to any public-commenting periods related to the WL-site licence.

RECOMMENDATION NO. 8: To ensure WL is thoroughly monitored during the next licencing cycle, there should be licencing conditions for each SCA to include parameters for an increase in on-site inspections for all SCAs, especially for those SCAs with repeated instances of non-compliance (e.g., the Emergency Management and Fire Protection SCA, the Security SCA, and the Human Performance SCA).

For instance, each SCA section of the Licence Conditions should require that the licensee shall be subject to at least one on-site inspection per year.

RECOMMENDATION NO. 9: Proposed Licence Condition 4.1 should reflect the length of the licence term. For example, if the licence is renewed for a period of 3-years, then condition 4.1 should have a deadline of every 3-years. Preferably, this condition should be subject to every 1-year.

RECOMMENDATION NO. 10: The Commission must ensure its decision-making aligns with the precautionary principle and only licence decommissioning activities which prioritize environmental protection, and human health and safety.

RECOMMENDATION NO. 11: The licence for the Whiteshell Laboratories site should be renewed for a period no longer than 1-year.

RECOMMENDATION NO. 12: The CNSC should cease reliance on CSA standards for any matters relevant to nuclear licensing, and instead conduct all standard setting and guidance with the CNSC's processes.

RECOMMENDATION NO. 13: The act of decommissioning and excavating a nuclear site does not justify the release of non-radiological hazardous emissions. We request an update on what CNL is doing to reduce the release of total particulate matter during decommissioning activities.

RECOMMENDATION NO. 14: The CNSC needs to pay attention to the NPRI's report and its thresholds when monitoring sites such as Whiteshell.

RECOMMENDATION NO. 15: CNL immediately to appoint a senior director who is a CNL Board member and whose sole responsibility is health and safety.

RECOMMENDATION NO. 16: CNL to draw up a written policy on health and safety matters which places substantial emphases on finance to improve matters.

RECOMMENDATION NO. 17: CNL to introduce a site safety committee chaired by a Board Director, which meets at least monthly.

RECOMMENDATION NO. 18: CNL to introduce safety representatives among the workforce to be given paid time off work to attend to their safety functions, and to be protected from arbitrary discrimination.

RECOMMENDATION NO. 19: CNL to incentivise safety among its directors.