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Licence Renewal

Cameco Corporation

Rabbit Lake Operation

Commission Public Hearing

Scheduled for:

June 7 to 8, 2023

Submitted by:

CNSC Staff

Un renouvellement de permis

Cameco Corporation

Opération Rabbit Lake

Audiences publique de la Commission

Prévue le :

7 au 8 juin 2023

Soumise par :

Le personnel de la CCSN

e-Doc 6870317 (WORD)
e-Doc 6890350 (PDF)

Summary

This CMD presents information about the following matters of regulatory interest with respect to Cameco Corporation's Rabbit Lake Operation:

- CNSC staff's review and assessment of and recommendation regarding Cameco's application for the renewal of uranium mine/mill licence UML-MINEMILL-RABBIT.01/2023

CNSC staff recommend the Commission consider taking the following actions:

- Renew the uranium mine/mill licence to authorize Cameco to operate the Rabbit Lake Operation until October 31, 2038
- Authorize the delegation of authority as set out in this CMD

The following items are attached:

- Current licence UML-MINEMILL-RABBIT.01/2023
- Proposed licence changes
- Proposed licence UML-MINEMILL-RABBIT.00/2038
- Proposed licence conditions handbook
- Summary of, and link to, the Environmental Protection Review Report for the Rabbit Lake Operation

Résumé

Le présent CMD fournit des renseignements au sujet des questions d'intérêt réglementaire suivantes en ce qui a trait à l'établissement de Rabbit Lake de Cameco Corporation :

- L'examen et l'évaluation par le personnel de la CCSN de la demande de Cameco visant le renouvellement de son permis d'exploitation de mines et d'usines de concentration d'uranium UML-MINEMILL-RABBIT.01/2023, et les recommandations connexes

Le personnel de la CCSN recommande à la Commission de considérer prendre les mesures suivantes :

- Renouveler le permis d'exploitation de mines et d'usines de concentration d'uranium afin d'autoriser Cameco à exploiter l'établissement de Rabbit Lake jusqu'au 31 octobre 2038
- Autoriser la délégation des pouvoirs prévue dans le présent CMD

Les pièces suivantes sont jointes :

- Le permis actuel UML-MINEMILL-RABBIT.01/2023
- Les modifications proposées aux permis
- Le permis proposé UML-MINEMILL-RABBIT.00/2038
- Les manuels des conditions de permis proposés
- Le résumé du rapport d'examen de la protection de l'environnement pour l'établissement de Rabbit Lake, et les liens connexes

Signed/signé le

22 February 2023

Murthy, Kavita

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EXECUTIVE SUMMARY

Cameco Corporation (Cameco) has requested the renewal of its Canadian Nuclear Safety Commission (CNSC)-issued licence for its Rabbit Lake Operation (RLO). The site is located in northern Saskatchewan, on Treaty 10 territory (1906), and the Homeland of the Métis, and is within the traditional territories of the Denesųłiné, Cree, and Métis. The RLO site includes both a mine and a mill, which have been in a state of care and maintenance since 2016. The current licence is valid from November 1, 2013, to October 31, 2023.

This Commission member document (CMD) presents CNSC staff's assessment, conclusions and recommendations in respect of Cameco's licence renewal application.

Licensed activities at the RLO have been subject to several federal and provincial environmental assessments over the years. These assessments concluded that, after taking mitigation measures into consideration, activities conducted at the RLO will not cause significant adverse environmental effects.

CNSC staff have evaluated the licensee's compliance with the requirements of the *Nuclear Safety and Control Act*, the *Uranium Mines and Mills Regulations* and other applicable regulations.

After assessing the licensee's regulatory performance, CNSC staff concluded that environmental and radiological risks remain low. Effluent quality and radiation doses are effectively controlled and kept below regulatory limits. The licensee's performance in the area of conventional health and safety also demonstrates that risks to workers are managed and activities are conducted safely.

CNSC staff therefore concluded that the proposed operation of the mine, mill and associated facilities remains within the bounds and intent of the current licensing basis. CNSC staff further concluded that the licensee is qualified to carry out licensed activities and will make adequate provision for the protection of the environment and the health and safety of persons, and for the maintenance of national security and of measures required to implement international obligations to which Canada has agreed.

CNSC staff recommend that the Commission take the following actions for the RLO:

1. Renew the uranium mine and mill licence to authorize Cameco to operate the Rabbit Lake Operation under licence UML-MINEMILL-RABBIT.00/2038 until October 31, 2038
2. Delegate authority as set out in this CMD.

Referenced documents in this CMD are available to the public upon request, subject to confidentiality considerations.

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 all available information pertaining directly to the current and proposed licence for the Rabbit Lake Operation, including:

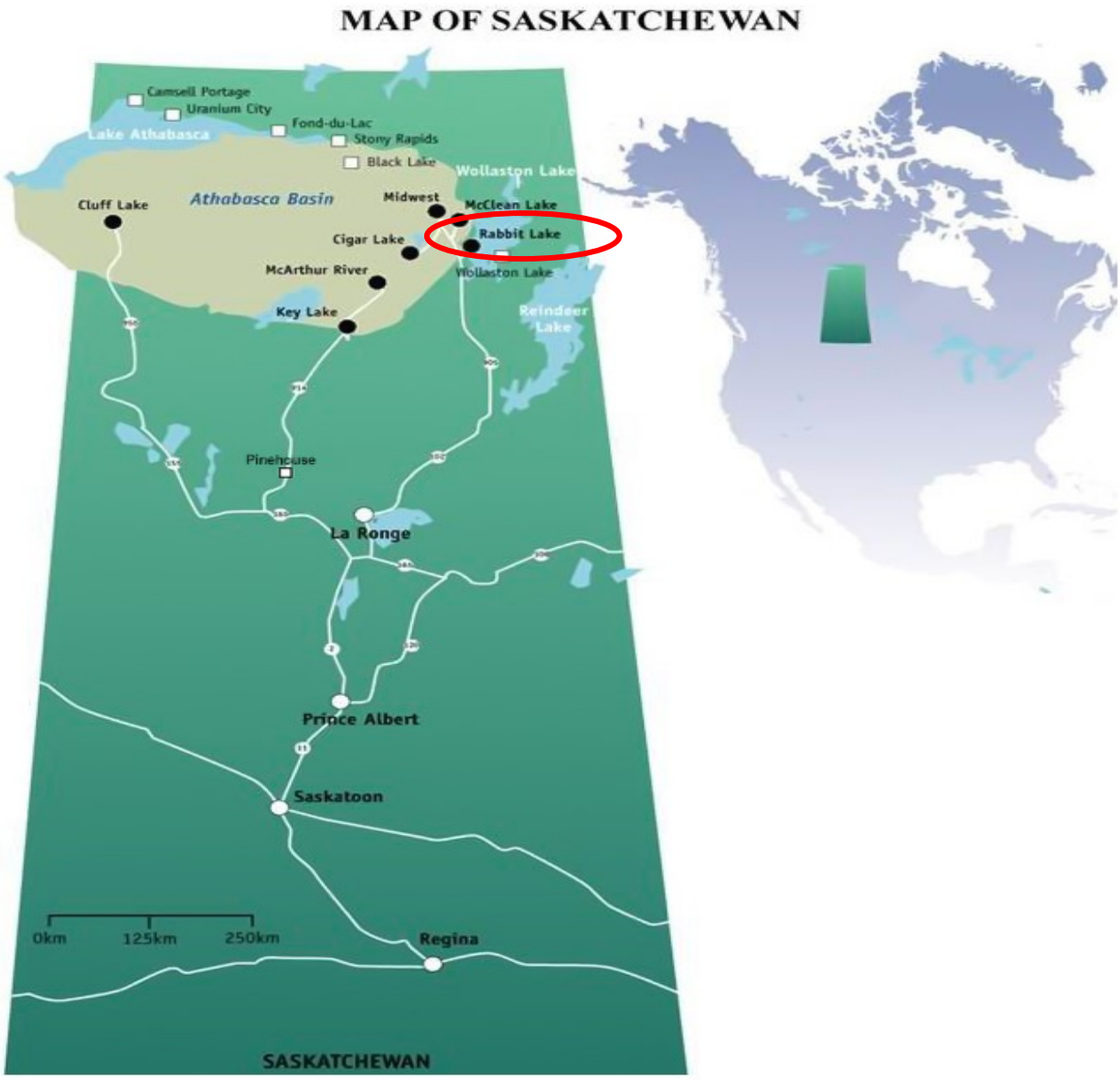
1. current licence, UML-MINEMILL-RABBIT.01/2023
2. proposed changes to the conditions, licensing period, or formatting of the current licence and licence conditions handbook
3. proposed licence, UML-MINEMILL-RABBIT.00/2038
4. proposed licence conditions handbook, LCH-MINEMILL-RABBIT.00/2038.

1. Overview

1.1 Background

Owned and operated by Cameco Corporation (Cameco), the Rabbit Lake Operation (RLO) is located approximately 750 kilometres north of Saskatoon, Saskatchewan (figure 1.1). The Eagle Point underground mine is located at the northern margin of the property. Moving southward, 3 mined-out pits, (2 reclaimed pits, A-Zone and D-Zone, and 1 flooded pit, B-Zone) all border Collins Bay of Wollaston Lake. The B-Zone pit remains isolated from Collins Bay by a dyke. In the central part of the property, the mined-out RLO pit was converted to an engineered in-pit tailings management facility (TMF). Adjacent to the in-pit TMF is the mill. South of the mill is the above ground tailings management facility (AGTMF), which has not received tailings since 1985. At the southern margin, after passage through settling ponds, all treated effluent, which must meet discharge limits, is continuously discharged into a series of creeks and fens and eventually reaches Hidden Bay of Wollaston Lake. The general site layout of the RLO is shown in Appendix A of the current licence in this Commission Member Document (CMD).

Figure 1.1: Location map



Source: Cameco Corporation

Following an October 2013 hearing, the Commission renewed the RLO Uranium Mine and Mill Licence: Cameco Corporation, Rabbit Lake Operation (UMOL-MINEMILL-RABBIT.00/2023) which was valid to October 31, 2023.

On April 21, 2016, Cameco formally announced that, due to market conditions, production at the RLO was to be suspended and the facility was placed into a safe state of care and maintenance. This decision allowed Cameco the flexibility to resume production when market conditions improve. No uranium concentrate was produced nor was any ore production conducted at RLO from 2017 to 2022.

To fulfill the 5-year update requirement, Cameco submitted a request on June 3, 2020, to the CNSC to update their financial guarantee for the RLO, including a Preliminary Decommissioning Plan (PDP) and Preliminary Decommissioning Cost Estimate. Following reviews by the Saskatchewan Ministry of Environment (SMOE) and CNSC staff, the financial instruments were found to be acceptable, and the PDP and Preliminary Decommissioning Cost Estimate were confirmed to be credible for future decommissioning of the RLO. CNSC staff determined that the decommissioning activities, which will take place in a staged manner over years, and the cost estimate, which includes contingency funds, are robust. Therefore, the proposed financial guarantee remains sufficient to cover the decommissioning liabilities. In addition, the value of the proposed financial instrument remains constant and is not dependent on the market outcome. This request included a proposed revision to the value of Cameco's financial guarantee from C$202.7 million to C$213.4 million which was approved by the Commission on March 9, 2021 [1, 2]. The updated PDP for the RLO was submitted by Cameco in December 2022 and is currently undergoing review. Once the review is complete and if the submission is considered acceptable, CNSC staff will prepare a CMD for the Commission's consideration of financial guarantee revisions.

Cameco has implemented the safe transition of the RLO to care and maintenance. The focus was on 3 key areas:

1. Preservation of facilities and equipment to ensure future availability.
2. Ongoing collection and treatment of contaminated water from various areas of the operation.
3. Maintenance of operational compliance with applicable regulations, approvals, and licensed programs.

The transition to care and maintenance occurred through the suspension of production and the safe shutdown of related infrastructure and systems. The main functional areas to be managed include mill operations, mine operations and tailings management. A submission updating the plan and process to be followed and the status of the facility was provided to the CNSC and the SMOE in October 2016. The submission has been reviewed by both agencies and the measures and activities outlined have been accepted. The following summarizes the transition initiatives.

Mill operations

The mill's transition to care and maintenance was similar to a routine maintenance shutdown event. The primary focus of the mill while in care and maintenance is the ongoing treatment of contaminated water from the mine, in-pit TMF, and lesser facilities across the site.

The required fire protection systems continue to be maintained throughout the main mill complex.

Mine operations

No exploration, development or production activities have taken place since 2016. During the care and maintenance transition, activities at the Eagle Point mine were minimized and the focus was on the continued dewatering of the mine.

The licensee conducts and reports on routine inspections of the mine to verify proper functioning of dewatering and ventilation systems and to monitor for unusual or changing conditions. Emergency response is maintained by the licensee in accordance with the requirements of the Saskatchewan Ministry of Labour Relations and Workplace Safety.

Tailings management

The RLO in-pit TMF continued to operate during the care and maintenance period. The primary operating functions involved:

- storing solids produced by the mill water treatment system
- providing ongoing dewatering of tailings solids and hydraulic containment of pore water, supernatant, surface runoff and groundwater from the existing catchment area
- providing short-term water storage capacity as part of the facility's water management system.

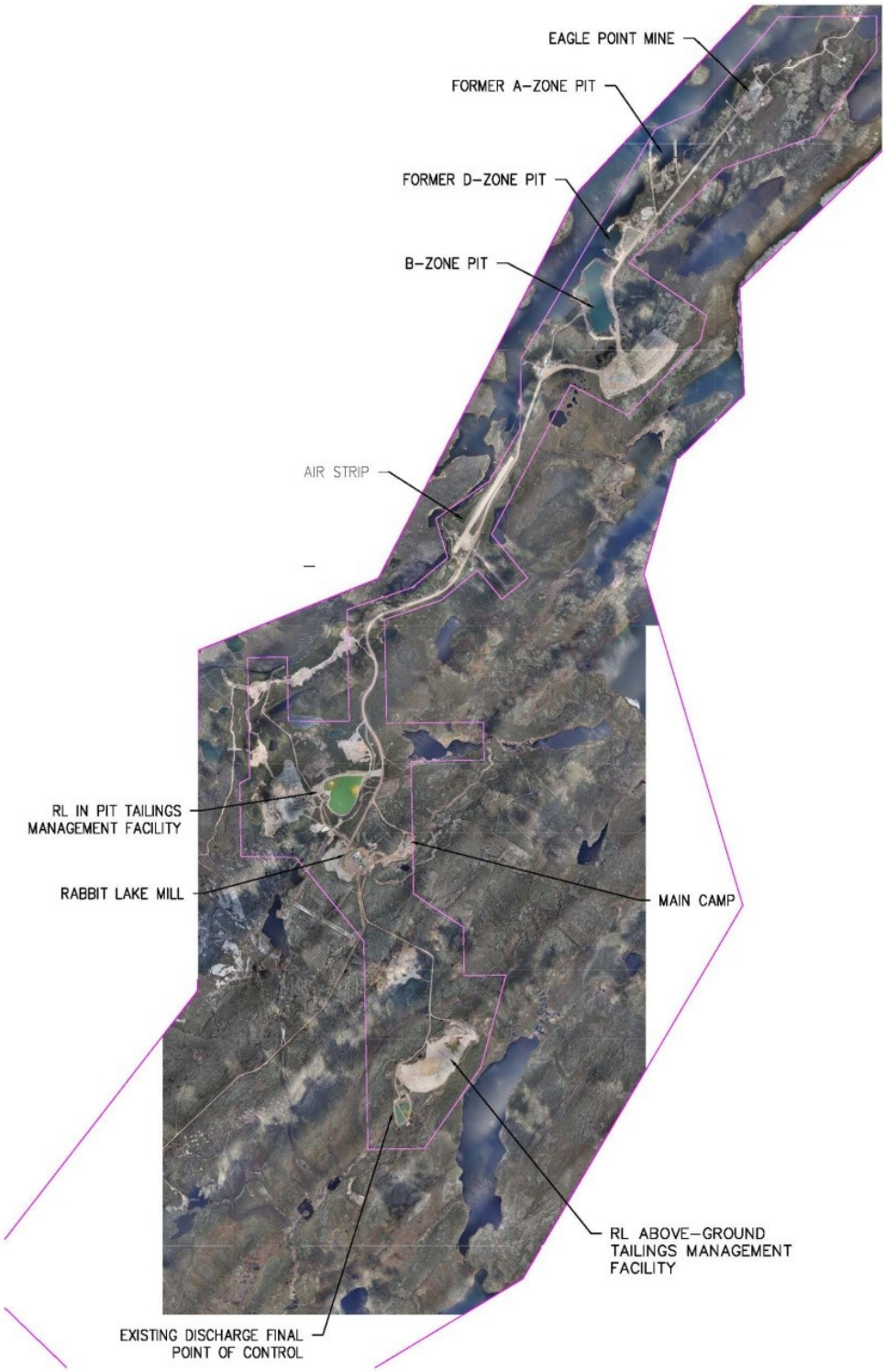
Reclamation

No changes to the existing PDP and cost estimate have occurred due to the suspension of production. Progressive reclamation activities will continue throughout the care and maintenance period. Cameco must notify CNSC staff if the scope of activities or timeline for decommissioning changes relative to the current operating status.

CNSC staff have verified the care and maintenance status of the mine and mill and the continuation of reclamation activities through desktop reviews of applications, reports and inspections. CNSC staff will continue to monitor and review the RLO's water management practices and reclamation activities to verify that the environment is protected during this period of care and maintenance.

An aerial view of the RLO is provided in figure 1.2.

Figure 1.2: Aerial view of the Rabbit Lake Operation



Source: Cameco Corporation

A complete list of the environmental assessments completed for the RLO is provided in the Environmental Protection Review report (RLO-EPR) [5].

All operating uranium mines and mills in Canada are regulated at the provincial and federal levels. At the provincial level, the Saskatchewan Ministry of Environment (SMOE) issues an Approval to Operate a Pollutant Control Facility Licence. Both SMOE and the Saskatchewan Ministry of Labour Relations and Workplace Safety conducts inspections of the RLO. At the federal level, the CNSC, Environment and Climate Change Canada, and Employment and Social Development Canada regulate uranium mines and mills. In addition, under the *Nuclear Safety and Control Act* (NSCA), uranium mines and mills must have a CNSC licence.

The authorized activities at the RLO are described within the CNSC staff-issued Licence Conditions Handbook (LCH) for the operation (provided in Part 2 of this CMD). The RLO is authorized to operate the Eagle Point underground mine, process uranium ore and produce up top to 4.25 million kilograms of uranium per year from the mill. Table 1.1 presents the mining and milling production data for the RLO for the current licence term.

Table 1.1: Mining/Milling production data, 2013–2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022[1]
Mill ore feed (Mkg/year)	334.9	386.9	313.7	61.67	0	0	0	0	0	0
Average annual mill feed grade (% U)	0.54	0.49	0.64	0.69	N/A	N/A	N/A	N/A	N/A	N/A
Percentage of uranium recovery (%)	97.2	97.3	97.1	97	N/A	N/A	N/A	N/A	N/A	N/A
Uranium concentrate produced (Mkg U/year)	1.59	1.60	1.62	0.43	N/A	N/A	N/A	N/A	N/A	N/A
Authorized annual production (Mkg U/year)	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25

[1] The 2022 reporting period is January 1, 2022, to September 30, 2022.
N/A = not applicable

The RLO is currently licensed by the CNSC to operate a uranium mine and mill site. The licence authorizes Cameco to:

a) prepare a site for and construct, operate, modify and decommission a *nuclear facility (hereinafter "the facility") for the mining of uranium ore and the production of uranium concentrate at a site known as the Rabbit Lake Operation in the province of Saskatchewan as shown on the drawing referenced in appendix A to this licence;*

b) mine a nuclear substance (uranium ore);

c) produce a uranium concentrate;

d) possess, transfer, import, use, store, and dispose of nuclear substances; and

e) possess, transfer, import, and use prescribed equipment that is required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (a), (b) and (c).

Cameco has applied to the CNSC for a licence renewal for the RLO and to continue its current activities [3, 4].

This CMD provides CNSC staff's assessment of the programs and measures planned or in place to provide adequate provision for the protection of the environment, the health and safety of persons, the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

1.2 Highlights

Cameco's applications for a licence renewal of its RLO

On April 20, 2021, Cameco submitted an application for the renewal of its CNSC-issued licence for the RLO [3]. CNSC staff assessed all aspects of Cameco's application for the renewal of the CNSC-issued licence UML-MINEMILL-RABBIT.01/2023.The proposed mining and milling operations at the RLO are within the currently authorized activities and production limits.

Cameco initially requested an indefinite licence term for the RLO. In response to feedback from Indigenous Nations and communities, Cameco subsequently revised its original application and on November 4, 2022, requested that the licence be renewed by the CNSC for a 20-year term [4].

CNSC staff assessment of Cameco's application

CNSC staff assessed Cameco's licence renewal application for its mining and milling operations at the RLO under subsection 24(4) of the NSCA. This assessment determined whether Cameco remains qualified to perform the activities to be authorized by the Commission and in doing so, will make adequate provisions 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.

The majority of people living near the RLO are Indigenous. In preparation for Cameco's application for the renewal of the CNSC-issued licence, CNSC staff held information sessions for representatives of Indigenous Nations and communities. This is further discussed in section 4.1. In addition, CNSC staff also participated in outreach sessions in September 2019 in Prince Albert, Saskatchewan and in September 2020 and October 2021 via Zoom meetings. With the easing of COVID-19 travel restrictions, an in-person information session was held in Saskatoon on September 15, 2022. These outreach events provided opportunities for community members and Indigenous leadership to express any concerns related to Cameco's RLO licence renewal request, including the proposed licence term. CNSC staff held, with Cameco, outreach sessions in various communities in northern Saskatchewan in November 2022. These sessions also provided the opportunity for the Indigenous Nations and communities and the public to engage in discussions on the proposed licence renewal directly with CNSC staff and Cameco.

Based on compliance verifications conducted at the RLO by CNSC staff during the November 1, 2013 to September 30, 2022 review period, CNSC staff have confirmed that Cameco continued to improve the management and safety performance of the facility. Over the duration of the current licence, CNSC staff rated Cameco's performance at the RLO for all 14 safety and control areas (SCAs) as "satisfactory". Cameco's overall SCA performance ratings for the RLO are presented in section 3.

Requested licence period

The existing licensing term for the RLO is 10 years. In Cameco's initial application to renew the CNSC-issued licence for the RLO, an indefinite licence term was requested. Cameco later revised this request and has now requested a 20-year term.

CNSC has a standardized licence and LCH framework which provides for effective regulatory oversight of operating facilities. Cameco is required by its licence to report on RLO's performance through annual compliance reports, including significant changes to its operations. CNSC staff verify compliance with requirements through desktop reviews, inspections and event reviews. In addition, CNSC staff report on the compliance performance of the operations annually to the Commission in public meetings through the regulatory oversight reports (RORs) for uranium mines and mills in Canada. As a result of the compliance verification program and the fact that there is regular reporting to the Commission, CNSC staff have concluded that regulatory effectiveness can be maintained for a licence term greater than 10 years. However, an indefinite licence term poses additional challenges, such as maintaining consistency between CNSC-issued licence terms and strong concerns expressed by Indigenous Nations and communities over the proposal and is therefore not supported by CNSC staff at the current time.

CNSC staff thus recommend that the Commission accept a 15-year licence term for the RLO, with the requirement for Cameco to complete a mid-term licensing basis review and update to the Commission. This update is to include a report prepared by Cameco to demonstrate that engagement with Indigenous Nations and communities is occurring on a regular basis. In addition, CNSC staff will require through specific licence conditions that the licensee provide a commissioning report if/when it is decided to restart operations at either the mine or mill or both, to describe in detail Cameco's work on ensuring sufficient human resources, the fitness for service, and engagement with Indigenous Nations and communities with respect to the RLO. A complete discussion on the proposed licence term is provided in section 5.5.

Financial Guarantees

On March 9, 2021, the Commission approved the application for an updated financial guarantee for the RLO in the amount of C$213.4 million.

In accordance with the requirements specified in the CNSC-issued LCH for the RLO, Cameco must submit an updated PDP and a Preliminary Decommissioning Cost Estimate to CNSC staff on a 5-year basis. The updated plan for the RLO was submitted by Cameco in December 2022 and is currently undergoing review. Once the review is complete and if the submission is considered acceptable, CNSC staff will prepare a CMD for the Commission's consideration of financial guarantee revisions.

1.3 Overall Conclusions

CNSC staff's assessment determined that the application complies with the regulatory requirements. CNSC staff also concluded that the licensee's performance during the licensing term was satisfactory and met regulatory requirements, as reported to the Commission annually through the Regulatory Oversight Report for Uranium Mines and Mills in Canada.

1.4 Overall Recommendations

CNSC staff recommend the following, in regard to the RLO:

1. **Conclude**, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* (NSCA) in that Cameco Corporation:
   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. **Issue** the proposed licence UML-MINEMILL-RABBIT.00/2038
3. Delegate authority as set out in section 5.6 of this CMD.

2. Environmental Protection Review

CNSC staff conduct environmental protection review's (EPRs) for all licence applications with potential environmental interactions, in accordance with the CNSC's mandate under the NSCA and associated regulations. The EPRs help inform the Commission's conclusion on whether the proposal provides adequate protection of the environment and the health of people.

CNSC staff reviewed the licence application to identify which 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* is required. For this licence application, neither are required because the application does not include activities listed in the *Impact Assessment Act*, *Physical Activities Regulations* that require an impact assessment, or that meet the definition of a project on federal lands.

CNSC staff's assessment of the RLO included a review of the licence application and supporting documents, including the environmental risk assessment, annual compliance monitoring reports, PDP, and past environmental performance for the facility. The RLO EPR report, which contains the results of this assessment, including a summary of past environmental assessments for the facility, is available on the CNSC website.

CNSC staff have found that the information provided by Cameco regarding environmental protection is sufficient to meet the applicable regulatory requirements under the NSCA and associated regulations for the licence renewal, as described in the RLO EPR report.

CNSC staff will continue to verify, through ongoing licensing and compliance activities and reviews, the environment and the health and safety of persons are protected over the proposed licence period.

3. General Assessment of Safety and Control Areas

CNSC staff review and assess an applicant's proposed measures and controls, and if applicable, a licensee's past performance in each safety and control area (SCA). CNSC staff's assessment of the application considers all SCAs. Rating level categories for the SCAs are provided in Appendix A.

The regulatory and technical basis for the matters discussed in this CMD arise directly from the *Uranium Mines and Mills Regulations* (UMMR) and the *General Nuclear Safety and Control Regulations* (GNSCR) as well as other regulatory requirements associated with the NSCA and relevant legislation. Further information regarding the regulatory and technical basis for the matters discussed in this CMD are provided in Appendix B to this document.

The CNSC implements a risk-informed approach in the regulation of nuclear facilities and activities. The functional area of any licensed facility consists of a standard set of SCAs. The depth of regulatory reviews of each SCA and the baseline frequency of regulatory compliance activities is informed by the risk ranking of that SCA. The high-level definitions of each SCA are provided in Appendix C.1. Each SCA is comprised of "specific areas" of regulatory interest; however, the specific areas associated with each SCA vary between facility types. Appendix C.2 provides the specific areas that comprise the SCAs for the operations.

CNSC staff's assessments provided in the following sections are based on a comprehensive review of Cameco's past performance at the RLO and a thorough evaluation of the safety and control measures to be implemented for the proposed licence period. These measures are outlined in Cameco's licence application [3, 4], and supporting documentation submitted for this application.

The risk ranking assessment and SCA evaluation period referenced within this CMD is from November 1, 2013, to September 30, 2022.

3.1 Management System

Safe and reliable operation requires a commitment and adherence to a set of management system principles and, consistent with those principles, the establishment and implementation of processes that achieve the expected results. CSA standard N286-12, *Management System Requirements for Nuclear Facilities* [6] contains the requirements for a management system for nuclear facilities and extends to all SCAs. The management system must 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 implementation of the management system. An adequately established and implemented management system provides the evidence that the licensing basis is adhered to.

The following specific areas that comprise this SCA are discussed as relevant to the licence renewal application including:

- management system and organization
- performance assessment, improvements and management review
- change management and records management
- contractor management program

3.1.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
The RLO has a mature management system which continues to improve to meet evolving regulatory requirements. CNSC staff monitor implementation of the management system at the RLO through compliance verification activities which includes desktop reviews and inspections. Cameco continues to have an effective management system and has taken proactive steps to review and incorporate the requirements of CSA standard N286-12, *Management System Requirements for Nuclear Facilities* into the RLO management system.									

3.1.2 Discussion

Cameco has established a management system to oversee its RLO activities to assure the protection of the health and safety of workers, the public, and the environment. Cameco is also required to implement and maintain written operating procedures and carry out the licensed activities in accordance with the policies and programs for the purposes described in the licence renewal application. Cameco uses an integrated quality management system that is comprised of management system policies, procedures, work instructions, forms, and other controlled documents (including reports and training manuals). CNSC staff monitored and evaluated the management system processes used for the licensed activities during the current licensing period.

Management system and organization

CNSC staff determined that the RLO has a management system that meets requirements as outlined in the LCH. CNSC staff regularly assess the compliance of the RLO's documents and programs through desktop reviews and planned compliance verification inspection activities.

Verification activities conducted throughout the licensing period included areas of maintenance, calibration, problem identification/resolution, change and design control, document and records control, the internal audit program, and annual reviews. All inspection findings in this SCA over the licence term were of low-safety significance.

CNSC staff evaluated the RLO's organizational structure. Personnel roles and responsibilities were also reviewed and confirmed to be well defined and documented. CNSC staff's compliance verification conducted during the current licence period verified no issues concerning the licensee's organizational structure and individual responsibilities of positions with oversight on licensed activities.

Performance assessment, improvements and management review

The RLO management teams conduct annual management reviews to analyze the previous years' performance when compared with its plans, assess compliance with standards, assess the effectiveness of the RLO's management system and consider any trends. CNSC staff assessed these management reviews as part of compliance verification activities and found them acceptable.

Cameco also conducts internal assessments to confirm conformance and effectiveness of its licensed programs and associated documentation at the RLO. Cameco completes internal assessments on a 3-year frequency and tracks resulting actions. Over the current licence period, CNSC staff performed inspections on RLO's internal assessment program and confirmed that the program met requirements.

Change management and records management

The design and change control procedures at the RLO ensures that changes are tested, reviewed and approved before implementation and that changes are controlled and carried out according to its change control documentation. Change control is a formal process used to ensure that changes to a product or system are introduced in a controlled and coordinated manner. The purpose of change control is to identify, evaluate, and control the risks associated with change.

The records management process at the RLO encompasses the control of documents, which includes the development, validation, approval of documents and the tracking of associated changes. Over the current licence period, the RLO's change management program and records management program met CNSC requirements.

Contractor management program

Cameco's contractor management program ensures that all contract workers at the RLO comply with the same requirements as the licensee's permanent staff.

Safety Culture

In order to assess safety culture at the operation, CNSC's REGDOC-2.12, *Safety Culture* was added to the RLO LCH, will full implementation by Cameco in June 2022. Safety culture will be assessed in the upcoming licensing term through compliance inspections, document reviews, potential licensee incidents and the licensee's responses to any incidents that occur at the operation.

3.1.3 Summary

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

3.1.3.1 Past Performance

Through review of Cameco's documentation and CNSC staff's regular compliance inspections, CNSC staff found that Cameco's performance in this area meets CNSC regulatory requirements. CNSC staff rated Cameco's performance for the management system SCA at the RLO as satisfactory during the current licence period.

3.1.3.2 Regulatory Focus

CNSC staff verified through inspections and desktop reviews that Cameco has implemented its management systems in accordance with CNSC's regulatory requirements.

Management system criteria were included in 8 CNSC inspections at the RLO during the current licensing period. There was also 1 focused management system inspection conducted at RLO during the current licence term.

Onsite verification activities conducted from November 1, 2013 to October 31, 2022 included areas of maintenance, calibration, problem identification/resolution, change and design control, document and records control, the internal audit program, contractor management, work planning, work control and annual reviews. All inspection findings where there was a non-compliance were of low-safety significance.

Cameco is required to implement and maintain a management system in compliance with CSA standard N286-12, *Management System Requirements for Nuclear Facilities* [6]. In June 2018, CNSC staff conducted a management system focused inspection at the RLO to verify the continued implementation of CSA N286-12 requirements. Inspections throughout the proposed licence term will be conducted to continue verification of implementation of the CSA N286-12 requirements.

CNSC staff will continue monitoring Cameco's performance in this area through regulatory oversight activities including inspections and desktop reviews.

3.1.3.3 Proposed Improvements

As noted in section 3.1.2, CNSC's REGDOC-2.1.2, *Safety Culture* was added to the RLO LCH, with full implementation by Cameco in June 2022. CNSC staff will conduct verification of the implementation of REGDOC-2.1.2 as part of ongoing compliance activities. CNSC staff will also review any proposed modifications to Cameco's management system documentation as it is adapted to conform to CSA N286-12.

3.1.4 Conclusion

CNSC staff concluded that Cameco met its regulatory requirements and has maintained and implemented a satisfactory management system program at the RLO.

3.2 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 area that comprises this SCA at the RLO is personnel training.

3.2.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
CNSC staff consistently rated the human performance management SCA as satisfactory during the current licence period for the RLO. Cameco has an acceptable training program and has improved performance through the implementation of a systematic approach to training (SAT) at the RLO during the current licensing period. Cameco continues to maintain and improve its training system and confirm implementation.									

3.2.2 Discussion

The systematic approach to training (SAT) is the framework endorsed by the CNSC for establishing and maintaining training for persons working in uranium mines and mills. 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. Cameco has implemented a SAT system to train its workers at the RLO.

Cameco reports to the CNSC annually on improvements to its training program and training delivered to workers. CNSC staff review Cameco's adherence to its training system and maintenance of training records through periodic routine compliance inspections.

CNSC's REGDOC-2.2.2, *Human Performance Management, Personnel Training*, updated in December 2016, defines the requirements for the development and implementation of a training system in a nuclear facility. It requires licensees to implement a training system to systematically analyze, design, develop, implement, evaluate, document and manage training for persons working in a nuclear facility. REGDOC-2.2.2 is included as compliance verification criteria in the existing LCH for the RLO.

CNSC staff concluded that Cameco is qualified to carry out its authorized licensed activities and CNSC staff are satisfied with the training system at RLO.

3.2.3 Summary

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

3.2.3.1 Past Performance

Based on a comprehensive review of Cameco's updated training documentation, annual reports and routine compliance inspections, CNSC staff concluded that Cameco's performance for this area meets regulatory requirements. CNSC staff rated Cameco's overall performance for the human performance management SCA at the RLO as satisfactory for the current licence period. CNSC staff are also satisfied that Cameco has taken, and will continue to take, all appropriate corrective actions necessary to resolve any non-compliances that stem from inspections and document reviews conducted during the current licence period.

3.2.3.2 Regulatory Focus

During the licence period, human performance management criteria were included in 1 focused inspection and 4 general inspections. These inspections were conducted at the RLO by CNSC staff.

Onsite compliance activities conducted from 2013 to 2022 included verification of the implementation of the SAT and worker training and qualifications. All inspection findings were of low-risk significance.

Cameco's current management system includes sections related to the training system and a suite of training procedures. In July 2017, CNSC staff conducted training focused inspections at the RLO to evaluate and verify compliance of Cameco's training programs and assess their effective implementation. CNSC staff evaluated Cameco's training system documentation and determined that regulatory requirements of the human performance management (training) SCA were met.

CNSC staff will continue to monitor performance in this area through routine regulatory oversight activities including inspections and desktop reviews. Should Cameco elect to restart operations at the RLO, human performance management would be an area of focus for CNSC staff to verify that a sufficient number of qualified staff are present for all safety-significant roles.

3.2.3.3 Proposed Improvements

The compliance verification criteria for this SCA in the RLO LCH includes CNSC's REGDOC-2.2.2 with an implementation deadline of October 31, 2022. Within the proposed LCH provided in this CMD, this deadline has been removed as Cameco is expected to be fully compliant. There are no other proposed improvements for this SCA in the LCH. For the current licence period, the performance rating for this SCA has been focused on the training programs and their implementation.

As part of on-going compliance activities, CNSC staff will continue to review any proposed modifications to Cameco's training system and programs.

3.2.4 Conclusion

CNSC staff concluded that Cameco met its regulatory requirements and has maintained and implemented a satisfactory human performance management program at the RLO.

3.3 Operating Performance

The operating performance SCA includes an overall review of the conduct of the licensed activities and other activities that enable effective performance. The specific areas that comprise this SCA are not addressed individually in this document.

3.3.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco has implemented and maintained an operating performance program at the RLO that include construction, commissioning and operation of the facility in accordance with CNSC regulatory requirements. CNSC staff monitor implementation of this operating program through compliance verification activities, which includes desktop reviews and routine inspections at the RLO. The operating performance SCA is a key compliance area and is included in many of CNSC staff inspections. CNSC staff's compliance activities verify that Cameco continues to improve its operating performance. Cameco's operating performance program at the RLO continues to be effective and meet regulatory requirements.									

3.3.2 Discussion

The operating performance SCA requires that the licensee implement and maintain an operating performance program for the conduct of licensed activities. This SCA focuses on the conduct of operations and the controls that are in place to manage risks from licensed activities.

The CNSC expects Cameco to take all reasonable precautions to protect workers and to control the release of nuclear and hazardous substances into the environment during the conduct of activities. The necessary precautions include engineering and administrative controls to minimize risks. The CNSC expects the licensee to maintain the integrity of its facilities and to apply managed processes for operations and control.

For a portion of the licensing period, the RLO was in full operation, however as noted in section 1.1, the sites operated in a safe state of care and maintenance from the end of 2016 until present day. Cameco has not announced its intent to transition to operations at this time.

CNSC staff confirmed throughout the licence period that Cameco operated the RLO in accordance with regulatory requirements. CNSC staff are satisfied with Cameco's program, which provide adequate assurance that any modifications to the facility or its production will remain within the licensing basis. Note that the operating performance SCA applies equally to both operational and care and maintenance states. Although there is currently no production at the RLO, there are still licensed activities being carried out and CNSC staff continue to verify that Cameco meets requirements for these activities.

3.3.3 Summary

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

3.3.3.1 Past Performance

Cameco has operated the RLO in compliance with CNSC regulatory requirements during the current licensing term and CNSC staff's findings from inspections or desktop reviews were addressed in a timely manner. CNSC staff rate Cameco's overall performance for the operating performance SCA at RLO as satisfactory for the current licence period.

3.3.3.2 Regulatory Focus

Cameco is required to report unplanned events at the RLO and take necessary corrective actions to improve safety and to prevent the recurrence of such events.

As identified in the attached draft LCH, and as reflected in CNSC's REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*, Cameco is required to submit detailed reports on unplanned situations or events.

During the current licence period, events related to mine and mill operations, lost-time injuries, environmental spills, and radiation protection action level exceedances were promptly reported to the CNSC and other relevant regulators including Saskatchewan Ministry of Environment, Saskatchewan Ministry of Labour Relations and Workplace Safety, and Environment and Climate Change Canada. All incidents were of either medium or low safety significance. CNSC staff verified that, in accordance with CNSC's REDGOC-3.2.1, *Public Information and Disclosure*, Cameco has continued to proactively disclose reportable events.

The radiation protection, conventional health and safety and environmental protection events reported to the CNSC by the licensee over the current licence period are described within sections 3.7, 3.8 and 3.9, respectively.

CNSC staff review all reported events to identify if there are any regulatory concerns and report significant events at public meetings of the Commission. Reported events included action level exceedances, injuries, spills, and releases of hazardous substances to the environment. Details on each reported event is included in the uranium mines and mills ROR for the year in which the event occurred. Additional information on radiation protection, environmental protection and health and safety incidents/events are provided in the respective sections within this CMD.

Table 3.1 lists the number of events reported to the CNSC by the licensee over the current licence period. The events include spills and lost time injuries.

Table 3.1: Number of reported events, 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Total number of events	2	5	4	3	1	1	1	0	5	1

* The 2022 reporting period is January 1, 2022, to September 30, 2022.

CNSC staff verified that Cameco conducted investigations into these reported events to determine probable causes and necessary corrective actions were taken by Cameco to prevent reoccurrences. The operating performance SCA was also included as compliance verification criteria in 15 general inspections and 1 focused CNSC inspection at the RLO during the current licence term.

CNSC staff confirmed that workers, the public and the environment continue to be safe. CNSC staff are satisfied with Cameco's event reporting, investigation processes, and timely implementation of corrective actions and lessons learned to minimize and/or eliminate future recurrences at the RLO.

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

3.3.3.3 Proposed Improvements

Improvements to operation, equipment and programs are identified on an ongoing basis and implemented as part of a process of continuous improvement. There are no other proposed improvements for this SCA.

3.3.4 Conclusion

During the current licence period, CNSC staff observed that Cameco has operated the RLO in compliance with the CNSC's regulatory requirements.

CNSC staff concluded that Cameco has maintained and satisfactorily implemented its operational performance programs and has made adequate provision for safe operation of the RLO.

3.4 Safety Analysis

The safety analysis SCA covers the 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 area that comprises this SCA at the RLO and addressed individually in this document is hazard analysis.

3.4.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has implemented and maintained processes to identify hazards and assessment of risks related to the protection of the environment and to the health and safety of workers and the public, as well as radiation protection. CNSC staff verify Cameco's implementation of the safety analysis SCA through inspections and desktop reviews. Cameco's safety analysis program at the RLO continues to be effective in providing CNSC staff with an assessment of the proposed changes or modifications, identification and evaluation of risks and impacts, and proposed mitigation measures.									

3.4.2 Discussion

As a licensing requirement, Cameco must implement and maintain a process to identify and assess hazards and risks on an ongoing basis at the RLO. This includes identifying and evaluating new or unforeseen risks that were not considered at the planning and design stages and updating previous risk assessments by replacing important assumptions with performance data.

Hazard analysis

Hazard analysis provides an opportunity to identify and mitigate potential hazards to worker health and safety, and to the environment, to an acceptable level. These analyses are completed by workers and subject matter experts before the work begins. Cameco uses the following methods for identifying risks and hazards at the RLO as the jobs are being planned:

- risk assessment
- safe work plans

Risk assessment

As per CNSC regulatory requirements, Cameco's RLO continues to maintain a register of hazards, risks and mitigation measures for the facility, which are reviewed and updated for the new projects, significant changes or modifications and non-routine tasks. Risk assessments are carried out to identify, manage, and reduce the potential of adverse risk. An assessment of controls is conducted as required and may be triggered by:

- predetermined need to re-evaluate a control
- changes to processes or facilities
- an incident
- an identified non-conformance
- following legislation/regulation changes
- following required actions as identified in investigations, inspections or by regulators

Risks are mitigated with consideration to the following hierarchy:

- elimination
- substitution
- engineering controls
- signage/warnings and/or administrative controls
- personal protective equipment

Safe work plans

Safe work plans are prepared for any work considered non-routine and high risk. The purpose of a safe work plan is to assess hazards specific to tasks, to ensure controls are developed and that all personnel understand the risks associated with the completion of the job. The safe work plan outlines the tasks and hazards involved, corrective actions, level of risk, training and personal protective equipment required. Safe work plans are to be reviewed and signed by all personnel working on the job.

Prior to implementing any significant change or modification to the facility, its operation or safety and control measures described in the documents provided to support the application, Cameco must provide the CNSC with an assessment of the proposed changes or modifications, identification and assessment of potential risks, impacts, proposed mitigation measures, and demonstrate that the changes meet the objective of the licensing basis.

Cameco has a change control process for the RLO that CNSC staff have reviewed and accepted. Changes to facility processes are completed through the change control process, which also includes a risk assessment requirement.

3.4.3 Summary

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

3.4.3.1 Past Performance

Through CNSC staff's review of Cameco's RLO documentation, CNSC staff concluded that the safety analysis program meets requirements.

For the current licence period, CNSC staff rated Cameco's overall performance for the safety analysis SCA as satisfactory for the RLO.

3.4.3.2 Regulatory Focus

CNSC staff conducted inspections and desktop reviews to confirm that safety analysis is also completed on an ongoing basis by Cameco's RLO on specific job requirements to assess all jobs of non-routine or complex nature. Through inspections, CNSC staff also verified that Cameco has the necessary safety analyses to plan, implement and monitor construction operations ensuring mitigation of risks to workers, the public and the environment have been conducted. A focused safety analysis inspection was conducted by CNSC staff in February 2017 at the RLO. The safety analysis criteria were also included in 2 inspections conducted by CNSC staff at the RLO, during the current licence term.

3.4.3.3 Proposed Improvements

There are no other proposed improvements for this SCA.

3.4.4 Conclusion

Based on the above assessment, CNSC staff concluded that Cameco is meeting the regulatory requirements and CNSC staff's expectations to protect workers and the environment at the RLO as it relates to the development and maintenance of the safety analysis for the facility.

3.5 Physical Design

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

The specific areas that comprise this SCA at RLO are not addressed individually in this document.

3.5.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has implemented and maintained a design control process that verifies and validates the design to ensure safety, performance and dependability of the facility. Cameco has a mature physical design control system in place, which continues to remain effective and meet regulatory requirements.									

3.5.2 Discussion

The CNSC expects licensees to implement and maintain a design control process to ensure that design outputs are verified against design inputs and performance expectations. The design control process includes:

- design planning
- input
- output
- review
- verification
- validation
- transfer
- records
- change management

Licensees are required to implement and maintain a design control process to ensure that design outputs are verified against design inputs and performance expectations. Cameco's physical design program for the RLO is described and documented in summarized form in the Mining Facility Licensing Manual [7] Mill Operations Program [8] and in detail in the Eagle Point Mine Program [9]. These documents provide details about the facility including physical description, technical specifications and capacities. Cameco uses facility change control and design control processes to ensure that any physical changes to the facility are reviewed and approved by site management before implementation. The facility change control and design control processes have been reviewed and accepted by CNSC staff.

The change management process includes a risk assessment requirement for new designs and design changes.

The following provides information on the most significant changes and improvements which have been or are being made at RLO during the current licence term.

Rabbit Lake In-Pit Tailings Management Facility (RLITMF)

During the initial portion of the current licensing term when operations were on-going, Cameco performed maintenance work on the water cover at the RLITMF to provide some mitigation measures in order to prevent the freezing of tailings during their placement.

Modifications to facility components and progressive decommissioning/ reclamation activities

Cameco performed modifications to various mine and mine processes to assist ongoing production. Improvements to such facility components as ventilation systems, water management and treatment processes were safely carried out.

While production had been suspended, Cameco continued to conduct progressive decommissioning and reclamation activities for the areas that were inactive on the site. These activities included:

- The decommissioned and reclaimed B-Zone waste rock pile undergoing field performance monitoring of its engineered cover system. Revegetation activities such as seed application and planting of alder were conducted.
- The inactive portions of the Above Ground Tailings Management Facility (AGTMF) had a cover layer placed and hydroseeded.
- Approximately 28,000 trees and shrubs were planted which made up the final stages of revegetation for the former mining areas at the A-Zone and D-Zone.
- Obsolete mobile equipment and unused fuel storage facilities were decommissioned.

3.5.3 Summary

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

3.5.3.1 Past Performance

During the current licence period, Cameco demonstrated to CNSC staff that the RLO follows its design control process when undertaking modifications or additions to facilities, processes, or equipment. For the RLO, Cameco exercised control and maintained its design basis during a state of care and maintenance by preserving key facilities for future use and remaining compliant with applicable regulations and licence conditions. Upgrades or replacements to the physical design were reviewed and found acceptable by CNSC staff.

3.5.3.2 Regulatory Focus

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

CNSC staff completed a focused physical design inspection in November 2017, and the physical design criteria was also included in 2 inspections conducted by CNSC staff at the RLO, during the current licence term. All non-compliances identified were of low safety significance and have been adequately addressed. Cameco's RLO continues to implement and follow the design control process as per CNSC's regulatory requirements.

3.5.3.3 Proposed Improvements

There are no other proposed improvements for this SCA. Improvements to operation, facility equipment and processes are identified on an ongoing basis and implemented as part of continuous improvement.

3.5.4 Conclusion

CNSC staff confirmed that Cameco followed its approved design and change management program in managing changes and improvements to the RLO during the licence period. Cameco's projects were completed as planned and within its respective safety cases. CNSC staff assessed Cameco's documentation and analyses under this SCA and found it to be acceptable. CNSC staff concluded that Cameco's overall performance at the RLO for this SCA is satisfactory and that Cameco is qualified to carry out the authorized activities in this SCA.

3.6 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 equipment is available to perform its intended design function when called upon to do so.

The specific areas that comprise this SCA at the RLO are not addressed individually in this document.

3.6.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has implemented and maintained programs to ensure structures and equipment remain effective and perform as designed over time. CNSC staff are satisfied with the implementation of the fitness for service program at the RLO.									

3.6.2 Discussion

The fitness for service SCA at the RLO covers activities that are carried out to ensure that the physical condition of structures, systems and components remain effective over time. This includes programs that ensure all equipment is available to perform its intended design function reliably when called upon to do so. The CNSC requires the licensee to implement and maintain a maintenance program to comply with regulatory requirements and accepted industry practice to minimize potential impacts to workers, the public and the environment. In addition, maintenance activities must provide assurance to achieve desired results, provide effective management of inventory of maintenance materials, manage maintenance records and procedures and provide systematic management of maintenance change control.

Cameco's maintenance group organizes and stores equipment information, maintenance records and facilities information on a computerized maintenance management system to coordinate the routine, predictive and preventative maintenance activities at the RLO. This computerized maintenance management system keeps track of the preventive maintenance program for all equipment and logs the equipment operating history. A facility change control procedure, reviewed and accepted by CNSC staff, is in place to control and record changes to the facilities.

CNSC staff verified through inspections and desktop reviews that Cameco maintains the RLO according to regulatory requirements and uses operational experience to ensure that the procedures, processes, structures, containment systems and components remain effective over time. Cameco has identified the safety-significant structures, systems and components at the RLO and implemented a documented and approved maintenance program to ensure that these remain effective.

CNSC staff's review of the maintenance management system at the RLO during regular inspections confirms that preventative maintenance activities are scheduled, completed and recorded. During the current licence term, CNSC staff routinely inspected maintenance records associated with the preventative maintenance programs and found them acceptable. Random sampling of equipment, maintenance and monitoring records were also verified during inspections. These compliance verification activities confirmed that the maintenance program is well documented and implemented.

3.6.3 Summary

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

3.6.3.1 Past Performance

Based on the results of compliance inspections and desktop reviews, CNSC staff rated Cameco's performance for the fitness for service SCA at the RLO as satisfactory for the current licence period.

3.6.3.2 Regulatory Focus

CNSC staff conducted fitness for service focused inspections at the RLO in December 2015 and April 2019. Fitness for service criteria were also included in 9 general inspections conducted by CNSC staff at the RLO, during the current licence term. All non-compliances identified were of low safety significance and have been adequately addressed.

CNSC staff will continue to monitor performance in this area through regulatory oversight activities including inspections and desktop reviews of Cameco's compliance reporting and revisions to relevant program documentation pertaining to this SCA. Should Cameco elect to restart operations at the RLO, fitness for service would be an area of focus for CNSC staff, to verify that all safety-significant systems are in a condition to allow a safe return to production.

3.6.3.3 Proposed Improvements

There are no other proposed improvements for this SCA.

3.6.4 Conclusion

CNSC staff have assessed Cameco's RLO documentation under the fitness for service SCA and found it to be acceptable. Cameco continues to maintain the facilities to ensure that structures, systems and components remain effective over time.

3.7 Radiation Protection

The radiation protection (RP) SCA covers the implementation of an RP program in accordance with the *Radiation Protection Regulations* (RPR). The program must ensure that radiation doses received by individuals and contamination levels are monitored, controlled and maintained as low as reasonably achievable (ALARA), social and economic factors taken into account.

The specific areas that comprise this SCA at the RLO addressed individually in this document are:

- application of ALARA
- worker dose control
- radiation protection program performance
- radiological hazard control

3.7.1 Trends

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

TRENDS FOR RADIATION PROTECTION									
Overall Compliance Ratings									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco has implemented and maintained a radiation protection program that meets regulatory requirements and protects the health and safety of workers at the RLO.									

3.7.2 Discussion

The RPR require licensees to implement an RP program to keep exposures ALARA, social and economic factors taken into account, through the implementation of a number of controls. These include management control over work practices, personnel qualification and training, control of occupational and public exposures to radiation, and planning for unusual situations. The RPR also prescribe dose limits for workers and members of the public.

As required by the UMMR, Cameco has an RP program and radiation code of practice in place at the RLO. The RP program includes continuous and routine radiological monitoring, dosimetry, and contamination control.

Application of ALARA

The RP program describes how the RLO manages radiation protection hazards and meets applicable regulatory requirements.

Cameco's application of ALARA within its RP program at the RLO includes management commitment and oversight, personnel qualification, and training.

In addition to key performance indicators for parameters such as radiation protection training, personnel dosimetry results, and workplace monitoring data, Cameco's RLO establish annual ALARA targets focused on worker dose reduction initiatives.

CNSC staff are satisfied with Cameco's measures in applying the ALARA principle to radiation exposures at the RLO. However, as CNSC staff see no indications of Cameco preparing for a return to operations at the RLO in the near-term, CNSC staff have initiated discussions with Cameco regarding adjustments to the RLO RP program. Cameco currently implements very similar RP programs across all its sites which include the RLO, the McArthur River mine, the Key Lake mill, and the Cigar Lake mine. The RLO RP program is suited to the radiation hazards at operating sites, while the radiation hazards faced by workers at the RLO have been greatly reduced since 2016. For example, limited radioactive material is present in the mill, workers no longer spend significant amounts of time in the underground workings of the mine, and neither uranium ore nor uranium ore concentrate are routinely handled. While CNSC staff acknowledge that the RLO RP program has been effective at controlling doses to workers, CNSC staff are of the opinion that action levels at the RLO should be reviewed to ensure that they reflect the RLO's reduced-hazard context. CNSC staff are advancing this file independent of the RLO licence renewal hearing and will report to the Commission on Cameco's revisions to their RP program through the annual uranium mines and mills ROR.

Worker dose control

When in operation the main source of radiological exposure at the RLO is from mining and milling high-grade uranium ore. The effective dose contributors to nuclear energy workers (NEWs) at the RLO are gamma radiation, radon progeny (RnP), long-lived radioactive dust (LLRD) and radon gas (RnG). In care and maintenance, these hazards remain present but at much-reduced levels. Gamma radiation hazards are controlled through the effective use of time, distance and shielding. Exposures to RnP and LLRD are controlled through source control, ventilation, contamination control and personal protective equipment.

Cameco's RP program at the RLO provides assurance that exposures to all persons on site remain compliant with the RPR. The RLO RP program describes how the licensee manages radiation protection issues, meets applicable regulatory requirements and keeps radiation exposures ALARA, social and economic factors considered (ALARA principle).

Licensed dosimetry services are utilized at the RLO for both external and internal dose assignment. The total effective dose assignment for workers is the sum of whole-body dose as measured by optically stimulated luminescent dosimeters for exposure to gamma radiation, and personal alpha dosimeters to measure exposures due to LLRD and RnP. For higher risk maintenance activities that involve the use of respiratory protection, worker exposures to airborne hazards are monitored through air sampling techniques and are administratively controlled through radiation work permits.

During the current licensing period, most worker doses at the RLO were from RnP. Exposures to RnP are controlled through ventilation, contamination control and personal protective equipment. Over the review period, the working group with the highest effective dose was the mill operators.

Exposure Summary

Cameco's RP program at the RLO includes processes and criteria to provide assurance that appropriate workers are identified as NEWs, as defined in section 2 of the NSCA. The regulatory effective dose limit for a NEW is 50 mSv/year and 100 mSv over a 5-year dosimetry period. As seen in figure 3.1, annual doses to workers at the RLO remained well below the 50 mSv/year regulatory limit.

As required by the RPR, all NEWs are notified in writing of their status, of the risks associated with radiation that they may be exposed to in the course of their work, and of the applicable effective and equivalent dose limits.

No RLO worker received an effective or equivalent dose that exceeded the corresponding regulatory dose limits pursuant to the RPR.

As defined in the RPR, the 5-year dosimetry period is a fixed 5-year period. During this licensing term there were two 5-year dosimetry periods that occurred: during January 1, 2011 to December 31, 2015, and January 1, 2016 to December 31, 2020. During the first dosimetry period (2011-2015) the maximum cumulative effective doses received by NEWS at the RLO was 49.33 mSv. For the second 5-year period (2016-2020) the maximum cumulative effective doses received by NEWS at the RLO was 8.52 mSv. Both were well below the CNSC's limit of 100 mSv.

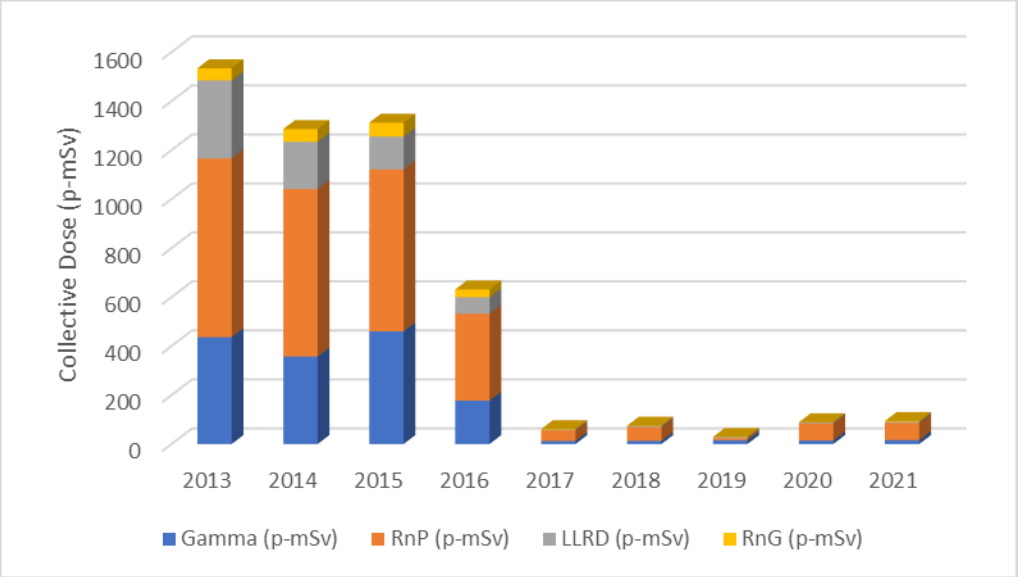
During the current licensing period, the annual collective dose[1] totals for the RLO ranged from 1,534 person-mSv (p-mSv) in 2013, to a low of 61 p-mSv in 2017. The decrease starting in 2016 is attributed to the suspension of production and placement of the operation into care and maintenance.

[1] The annual collective dose is the sum of effective dose assigned to workers at the RLO in a given calendar year.

Since transitioning into a state of care and maintenance in late 2016, there were no instances in which the collective dose for NEWs due to RnG exceeded 1 p-mSv. At the RLO, individual exposures to RnG are assigned when workers spend time in areas where RnG concentrations are greater than 3,000 Bq/m^3 [2]. However, RnG levels (as confirmed through routine monitoring programs) rarely exceed these levels. The maximum RnG dose to an individual in the current licence period was 0.12 mSv.

Figure 3.1 displays the annual collective doses for NEWs at the RLO for the current licensing period and figure 3.2 displays the maximum and average individual effective doses to NEWs from 2013 through 2021.

Figure 3.1: Annual collective doses for NEWs, 2013-2021

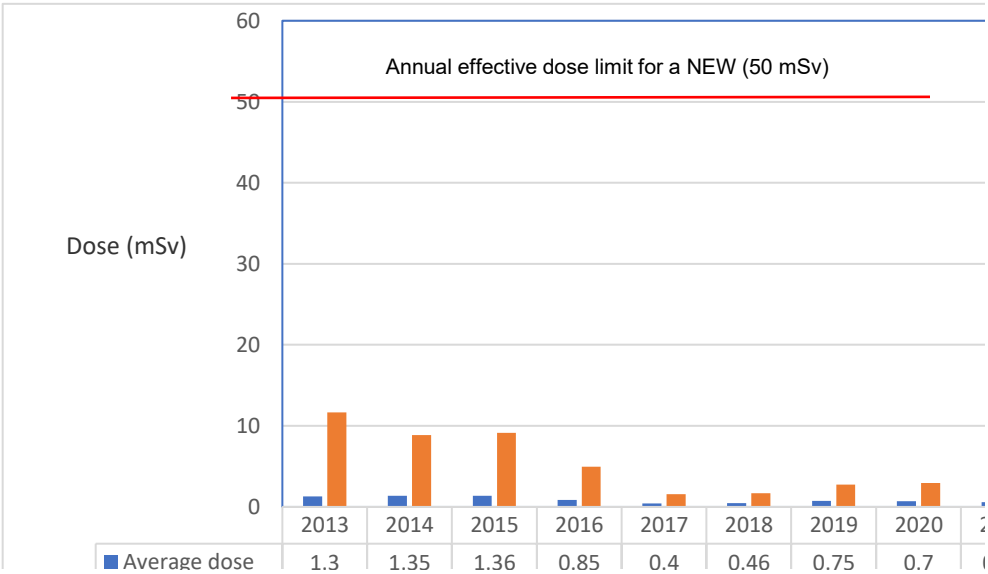


	2013	2014	2015	2016	2017	2018	2019	2020	2021
Gamma (p-mSv)	436	357	460	177	12	13	15	14	16
RnP (p-mSv)	730	684	661	355	44	56	68	70	70
LLRD (p-mSv)	318	193	134	67	3	5	5	4	5
RnG (p-mSv)	50	52	57	32	2	1	1	1	3
Total*	1,534	1,286	1,312	631	61	75	89	89	93

RnP = radon progeny; LLRD = long-lived radioactive dust; RnG = radon gas
* The total collective dose may not match the individual components due to rounding errors.

[2] Continuous occupancy in radon gas (excluding progeny which is accounted for separately) at 3,000 Bq/m^3 for 2,000 hours (considered a working year) would result in a committed effective dose of 1 mSv.

Figure 3.2: Maximum and average individual effective doses to RLO NEWs, 2013-2021



In 2021, the maximum dose was 2.47 mSv for RLO. No worker exceeded the regulatory individual effective dose limit of 50 mSv in 1 year or 100 mSv in a 5-year dosimetry period. As described in section 1.1, RLO went into care and maintenance in late 2016 and a reduction in doses is seen from that time due to reduced activities at the site (no mining or milling).

Radiation protection program performance

CNSC compliance activities

CNSC staff assessed RP program performance at the RLO over the current licensing period through various compliance verification activities including desktop reviews of monthly, quarterly, and annual compliance reports. CNSC staff have observed and verified RP practices at the RLO during 24 compliance inspections, including 2 focused RP inspections conducted in October 2015 and December 2016.

Overall, inspection findings have confirmed ongoing compliance with the RPR during the current licensing period. Non-compliant findings have been identified; however, these regulatory findings have been of low safety significance and were not indicative of widespread deficiencies in RP program implementation. The licensee has taken timely actions to address all regulatory findings. CNSC staff have verified that Cameco has taken appropriate corrective actions and these non-compliances are now closed.

The RLO RP program has been effective in providing adequate protection to workers from radiological hazards throughout the current licensing period. As a result of inspections and desktop review verification activities, CNSC staff confirmed the RLO RP program complies with CNSC regulatory requirements.

Radiological action levels

The UMMR and the RPR require that a licensee report any RP action level exceedances. The action levels for effective doses identified in the RLO RP program are 1 mSv per week and 5 mSv per quarter. Action level exceedances during the current licence period at the RLO is outlined in the table 3.2.

Table 3.2: RLO action level exceedances, 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Weekly Action Level (1.0 mSv/wk)	0	0	0	0	0	0	0	0	0	0
Quarterly Action Level (5.0 mSv/qtr)	0	0	0	0	0	0	0	0	0	0

* The 2022 reporting period is from January 1, 2022 to September 30, 2022.

There were no RP action level exceedances at the RLO during the current licence period. Due to 2 events that occurred at Cameco's Key Lake Operation in 2015 related to the calciner, CNSC staff issued requests according to subsection 12(2) of the *General Nuclear Safety and Control Regulations* to all operating uranium mills in order to obtain additional information.

Cameco's RLO does not use a calciner, but instead uses a drier in preparing yellowcake product for packaging. Notwithstanding this, CNSC site inspections have verified the safe state of the RLO yellowcake processes, improved air and radiation monitoring measures, and that lessons learned from the Key Lake calciner events have been applied at the RLO. CNSC staff were satisfied with the responses and corrective actions taken by Cameco.

CNSC staff are satisfied with the performance of Cameco's RP programs implementation at the RLO.

Radiological hazard control

Radiation and contamination control procedures have been established at the RLO to control and minimize radiological hazards and the spread of radioactive contamination. Radiological monitoring results confirm the effectiveness of contamination control procedures and include a combination of direct and indirect contamination monitoring of eating areas, footwear, work clothing and personal protective equipment. Routine airborne monitoring programs have been established for LLRD, RnP and RnG. When sample results exceed administrative levels, protective actions are taken as specified in Cameco's RLO radiation code of practice. The RLO uses continuous RnP detectors with warning lights to monitor and warn workers of elevated RnP levels.

Cameco possesses sealed sources, unsealed sources and radiation devices at the RLO that are regulated under the *Nuclear Substances and Radiation Devices Regulations*. These radiation sources range in type from fixed nuclear gauges to radiation instrumentation calibration sources. The controls associated with these radiation sources are supported by the RP program including training, leak testing, radiation warning signs and access control to areas where such sources are used or stored.

CNSC staff are satisfied that radiological hazards have been adequately controlled at RLO.

3.7.3 Summary

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

3.7.3.1 Past Performance

Based on the review of RLO's monthly, quarterly and annual compliance reports and CNSC staff's routine compliance verification activities, CNSC staff rate the performance for the RP SCA as satisfactory for the current licence period for RLO.

3.7.3.2 Regulatory Focus

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

3.7.3.3 Proposed Improvements

There are no other proposed improvements for this SCA.

3.7.4 Conclusion

CNSC staff assessed Cameco's documentation and analyses at the RLO under the RP SCA and found them to be acceptable. CNSC staff are satisfied with Cameco's efforts in applying the ALARA principle to keep the doses to persons ALARA over the current licence period but will also be pursuing programmatic changes at the RLO to better tailor the RP program to the state of care and maintenance. Therefore, CNSC staff concluded that the overall performance for this SCA is satisfactory, and that Cameco is qualified to carry out the authorized activities at RLO in this SCA.

3.8 Conventional Health and Safety

The conventional health and safety SCA covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.

The specific areas that comprise this SCA at the RLO addressed individually in this document are:

- performance
- practices
- awareness

3.8.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has acceptable conventional health and safety programs to identify and control risks. CNSC staff monitor implementation of the programs to ensure protection of workers. Cameco has been proactive in identifying and managing risks to improve health and safety performance. Cameco's conventional health and safety programs and their implementation continues to improve, be effective and meet applicable regulatory requirements.									

3.8.2 Discussion

The CNSC requires licensees of uranium mines and mills 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 Cameco 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 the RLO.

The occupational health and safety programs at the RLO 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.

Performance

A key performance measure for this SCA is the number of lost-time injuries (LTIs) that occur per year. An LTI is an injury that takes place at work, resulting in the worker being unable to return to work and carry out their duties for a period of time.

Table 3.3 shows the total number of LTIs, their frequency and severity that occurred during this licensing period at the RLO. CNSC staff reviewed the investigation reports and verified that corrective actions have been implemented and remain effective. Since 2010, all LTIs are discussed and reported to the Commission as part of CNSC staff's uranium mines and mills annual ROR.

Table 3.3: LTIs, severity rate and frequency rate, 2013-2022

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022*
Number of LTIs[1]	0	1	2	1	0	0	1	0	0	0
Severity rate[2]	25.8	11.4	55.3	2.65	0	0	104.79	40.86	0	0
Frequency rate[3]	0	0.15	0.33	0.26	0	0	1.05	0	0	0
Total Recordable Incident Rate[4]	3.50	3.60	4.26	1.89	1.03	5.03	2.10	1.13	1.04	3.08

* The 2022 reporting period is January 1, 2022 to September 30, 2022.

[1] An injury that takes place at work and results in the worker being unable to return to work for a period of time.

[2] A measure of the total number of days lost to injury for every 200,000 person-hours worked at the facility. Accident severity rate = [(# of days lost in last 12 months) / (# of hours worked in last 12 months)] x 200,000.

[3] A measure of the number of LTIs for every 200,000 person-hours worked at the facility. Accident frequency rate = [(# of injuries in last 12 months) / (# of hours worked in last 12 months)] x 200,000.

[4] A measure of the number of fatalities, lost-time injuries, and other injuries requiring medical treatment for every 200,000 person-hours worked at the facility. Recordable incident rate = [(#incidents in last 12 months) / # hours worked in last 12 months)] x 200,000.

Inspections regarding conventional health and safety were also carried out by Saskatchewan Ministry of Labour Relations and Workplace Safety inspectors during the current licensing period. Inspection reports are shared between CNSC staff and Provincial counterparts, and regular oversight is provided by CNSC staff as needed. Safety-related findings and incidents were properly investigated and corrected by Cameco in a timely manner and the resulting reports were acceptable to the CNSC and Saskatchewan Ministry of Labour Relations and Workplace Safety.

Practices

In addition to the NSCA and its associated regulations, the RLO activities and operations must comply with applicable federal and provincial health and safety related acts and regulations. For example, *The Saskatchewan Employment Act* requires that Cameco establish and maintain a joint occupational health and safety committee at each facility.

To assure continued strong safety performance and continual improvement, Cameco's conventional health and safety program at the RLO includes the following provisions:

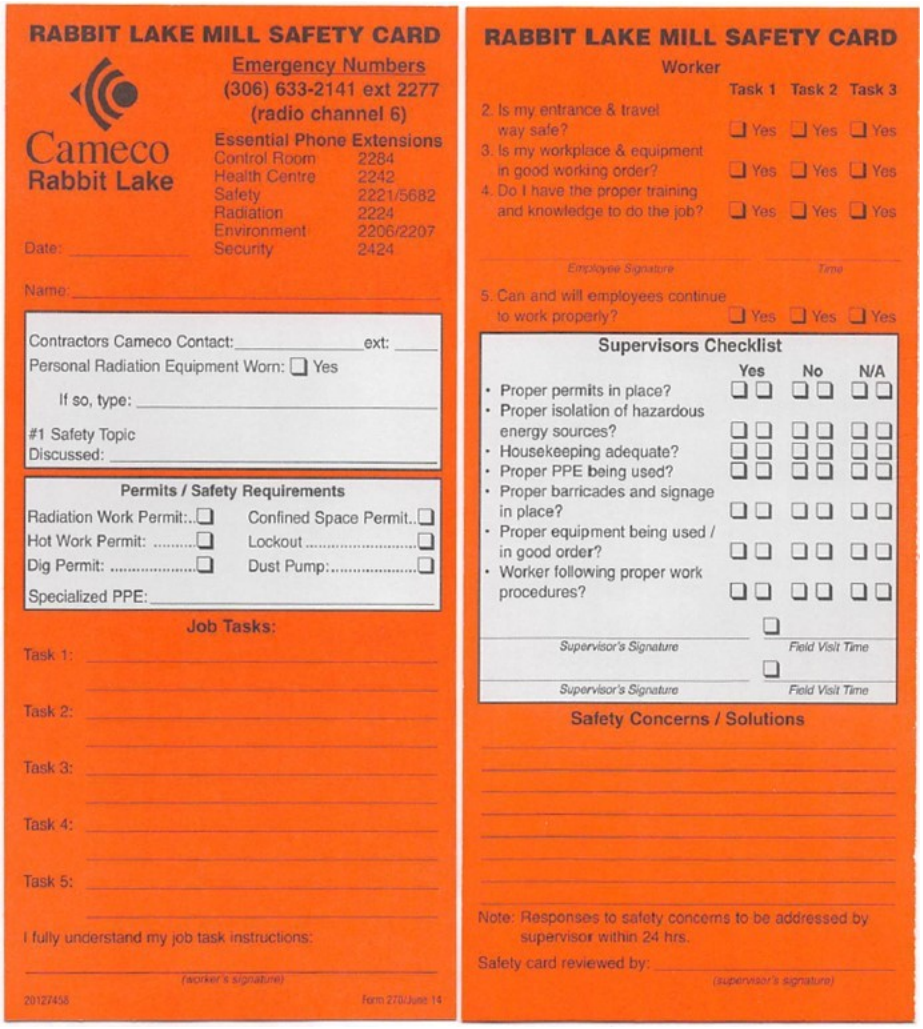
- scheduled safety orientation and training
- five-point daily safety cards
- work permits for specialized work
- planned inspection program
- occupational health committees
- health centre operation
- incident investigations and corrective action performance tracking
- contractor safety management
- management of change
- regular safety meetings

CNSC staff have observed and verified safety practices during compliance inspections. The conventional health and safety SCA is included as a component in many CNSC inspections. Cameco reported safety events in a timely manner and in compliance with the regulations for the RLO.

Risk assessments are used to compile a list of safety and health hazards and their controls. The list of safety and health hazards and their controls is routinely reviewed and updated to reflect continual improvement and changes at the RLO.

Cameco uses leading key performance indicators to monitor preventative efforts. Health and safety objectives are developed based upon the review of the hazards, reviews of investigation and inspection reports and reviews of five-point safety cards (figure 3.3).

Figure 3.3: RLO mill five-point safety card



RABBIT LAKE MILL SAFETY CARD

Cameco
Rabbit Lake

Emergency Numbers
(306) 633-2141 ext 2277
(radio channel 6)

Essential Phone Extensions

Control Room	2284
Health Centre	2242
Safety	2221/5682
Radiation	2224
Environment	2206/2207
Security	2424

Date: _____

Name: _____

Contractors Cameco Contact: _____ ext: _____
Personal Radiation Equipment Worn: ❑ Yes
If so, type: _____
#1 Safety Topic Discussed: _____

Permits / Safety Requirements

Radiation Work Permit: ❑ Confined Space Permit: ❑
Hot Work Permit: ❑ Lockout ❑
Dig Permit: ❑ Dust Pump: ❑
Specialized PPE: _____

Job Tasks:

Task 1: _____
Task 2: _____
Task 3: _____
Task 4: _____
Task 5: _____

I fully understand my job task instructions:
_____
(worker's signature)

20127458 Form 270/June 14

RABBIT LAKE MILL SAFETY CARD

Worker

	Task 1	Task 2	Task 3
2. Is my entrance & travel way safe?	❑ Yes	❑ Yes	❑ Yes
3. Is my workplace & equipment in good working order?	❑ Yes	❑ Yes	❑ Yes
4. Do I have the proper training and knowledge to do the job?	❑ Yes	❑ Yes	❑ Yes

_____ _____
Employee Signature Time

5. Can and will employees continue to work properly? ❑ Yes ❑ Yes ❑ Yes

Supervisors Checklist

	Yes	No	N/A
• Proper permits in place?	❑ ❑	❑ ❑	❑ ❑
• Proper isolation of hazardous energy sources?	❑ ❑	❑ ❑	❑ ❑
• Housekeeping adequate?	❑ ❑	❑ ❑	❑ ❑
• Proper PPE being used?	❑ ❑	❑ ❑	❑ ❑
• Proper barricades and signage in place?	❑ ❑	❑ ❑	❑ ❑
• Proper equipment being used / in good order?	❑ ❑	❑ ❑	❑ ❑
• Worker following proper work procedures?	❑ ❑	❑ ❑	❑ ❑

❑
_____ _____
Supervisor's Signature Field Visit Time

❑
_____ _____
Supervisor's Signature Field Visit Time

Safety Concerns / Solutions

Note: Responses to safety concerns to be addressed by supervisor within 24 hrs.

Safety card reviewed by: _____
(supervisor's signature)

Source: Cameco Corporation

Contractor safety risk continues to be effectively managed. Contractors are expected to follow Cameco's safety program or have an equivalent program. Contractors are required to comply with program requirements and regulations, manage the hazards and controls associated with its work, and provide a health and safety program for its workers.

Both general safety and high hazard specific procedures have been developed to assist employees with planning work and to mitigate risk. Some specific high hazard work procedures include confined space entry, ground disturbance, hot work, lock-out, working in hot environments and respiratory protection.

All new employees, contractors or service representatives arriving at RLO receive site orientation. This orientation covers general site rules and provides the worker with the required information to work safely at the facility.

Cameco is meeting expectations and CNSC staff are satisfied with its performance at the RLO in this area.

Awareness

Cameco has established conventional health and safety policies and programs for the RLO to ensure the protection of workers from physical, chemical and radiation hazards that may arise in the course of their work at the facility. Cameco has developed and continues to deliver safety-related training to employees and contractors. This encompasses the safety areas of general health and safety knowledge, radiation protection, fire protection, regulatory requirements and job/task-specific safety training related to hot work permit, lock-out/tag-out, and the use of a Workplace Hazardous Materials Information System which provides information on the safe use of hazardous materials.

Cameco's integrated safety, health, environment and quality management system requires that both Cameco corporate and site senior management review their safety and health management program at scheduled intervals to ensure the program's continuing suitability, adequacy, effectiveness and sustainability.

3.8.3 Summary

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

3.8.3.1 Past Performance

Through the review of the occupational health and safety documentation, site conditions and practices during the licence period, CNSC staff concluded that Cameco's occupational health and safety program at the RLO meets CNSC regulatory requirements.

For the current licence period, CNSC staff rated Cameco's overall performance for the conventional health and safety SCA as satisfactory during the current licence term.

3.8.3.2 Regulatory Focus

The conventional health and safety criteria were also included in 22 inspections conducted by CNSC staff at the RLO during the current licence term. All non-compliances identified were of low safety significance. Cameco addressed all non-conformances and recommendations identified during the current licence period.

CNSC staff will continue to monitor performance in this area through regulatory oversight activities including inspections and desktop reviews of Cameco's compliance reporting and revisions to relevant program documentation pertaining to this SCA. Should Cameco elect to restart operations at the RLO, conventional health and safety would be an area of focus for CNSC staff, to verify that the significant influx of persons to the site which would have to be associated with restart does not result in a reduction in performance in this area.

3.8.3.3 Proposed Improvements

There are no proposed improvements for this SCA.

3.8.4 Conclusion

CNSC staff concluded that Cameco has effectively managed workplace safety hazards at the RLO. Compliance verification activities will continue to be conducted at the facility to confirm that Cameco's RLO continues to view conventional health and safety as an important consideration.

Cameco's conventional health and safety program and implementation continue to be effective, meet applicable regulatory requirements, and are rated as satisfactory.

3.9 Environmental Protection

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

The specific areas that comprise this SCA at the RLO addressed in this CMD are:

- effluent and emissions control (releases)
- environmental management system (EMS)
- assessment and monitoring
- protection of people (this includes Indigenous Nations and communities)
- environmental risk assessment (ERA)

3.9.1 Trends

The following table provides the annual compliance ratings for the environmental protection SCA for the current licence period.

TRENDS FOR ENVIRONMENTAL PROTECTION									
Overall Compliance Ratings									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco has implemented, maintained and continuously improved its environmental protection programs at the RLO that protects the environment and the public in accordance with CNSC regulatory requirements. During the current licence period, releases to the environment were generally well below the release limits specified in the CNSC licence. CNSC staff monitor Cameco's implementation of the environmental protection program through compliance verification activities. Cameco updated its Environmental Risk Assessment (ERA) in 2020 for the RLO. The predicted environmental impacts from RLO are consistent with those outlined in previous ERAs.									

3.9.2 Discussion

Under the UMMR, Cameco's RLO is required to develop and implement environmental protection policies, programs and associated procedures that comply with all applicable federal and provincial regulatory requirements, in order to control the release of nuclear and hazardous substances into the environment, and to protect the environment and human health. Listed below are the environmental protection regulatory documents and standards that Cameco must implement under its licence for the proposed licence period.

Cameco has implemented the requirements of:

- CSA N288.4-10, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [11]
- CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [12]
- CSA N288.6-12, *Environmental Risk Assessment at Class 1 Nuclear Facilities, and Uranium Mines and Mills* [13]
- CSA N288.7-15, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [14]
- CSA N288.8-17, *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities* [15]
- CNSC's REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures*.

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

Effluent and emissions control (releases)

The RLO has a system to treat both mine and mill production effluents and emissions. The treatment processes work as follows:

- The mill effluent is processed with a treatment system of chemical precipitation and liquid/solid separation. Tailings slurry is transported through a pipeline from the mill to the RLITMF for disposal. Water from the tailings percolates through the pervious envelope to the coarse surround, drains to the under-drain drift located at the bottom of the pit which is connected to a raise well. Water is then pumped to the surface then to the mill for treatment. Even during periods of suspended production, the tailings are continuously being dewatered.

- At the RLO's water treatment circuit, contaminated or potentially contaminated water is treated from various streams such as mine water and clarified barren strip. The majority of water treated at the RLO comprises of mine water and raise water from the RLITMF. The process for water treatment consists of low pH, high pH and final pH treatment circuits followed by an effluent polishing stage. Finally, the treated water from the mill is piped as effluent to the effluent polishing area precipitation ponds prior to being discharged to the environment.

Release limits are specified within the LCH for the RLO. The draft LCH is provided within Part 2 of this CMD. The release limits are adopted from the *Metal and Diamond Mining Effluent Regulations* (MDMER). The CNSC has incorporated the licence limits for selenium and uranium imposed by the Province of Saskatchewan into the licensing basis. The CNSC also requires Cameco to demonstrate the principles of ALARA and Best Available Technology Economically Available as per REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures* at the RLO. This results in contaminant concentrations in effluent releases which are substantially lower than those authorized by the province of Saskatchewan.

The CNSC has an interim objective for uranium in effluent of 0.1 mg/L for liquid effluent. The CNSC uses the interim objective to assess the performance of a licensee's treatment process with respect to uranium. This value is based on a 2006 review of uranium treatment within the uranium mining and milling sector, which was contracted by the CNSC.

The effluent discharge is also subject to regular toxicity testing as required by the MDMER and to the action levels specified within the RLO environmental code of practice. Action levels provide early indication of a potential loss of control of part of the environmental protection program. Thus, action levels are used to ensure that the licence release limits will not be exceeded. In 2018, Cameco provided their initial submission for the updated action levels using actual performance data and by following the requirements as outlined in CSA standard N288.8-17; these requirements were implemented in 2022 [15].

At the RLO mill water treatment plant, the treated effluent is pumped to polishing ponds where it travels through a series of 3 ponds before being discharged to the environment at Weir #3. The compliance monitoring consists of the collection of weekly composite (24-hour) samples. A composite sample of the final effluent is taken by an automatic interval sampling system. Instrumentation also monitors the pH of the effluent, the flow rates of the reagents and flocculants added during the water treatment process. This monitoring allows the RLO to detect any process upsets and take immediate corrective actions.

Throughout the previous licensing period, monitoring verified that the RLO effluent posed no environmental concern. The effluent discharged from the RLO was not acutely lethal and met the requirements in the MDMER during the licence period. Furthermore, all the average annual concentrations of parameters are within the predictions in the 2020 Environmental Risk Assessment [10].

Published program summaries of these documents for the RLO licence renewal are available on Cameco's website.

Uranium, molybdenum and selenium in effluent

Treated effluent released to the environment

For previously identified constituents of potential concern (COPC) with the potential to adversely affect the environment (i.e., uranium, molybdenum and selenium), the effluent treatment system at the RLO continued to meet performance expectations in terms of reducing the concentrations of these parameters. CNSC staff verified molybdenum concentrations decreased from 2012 levels, were relatively consistent during 2014 to 2016, and showed a further decline in 2017 and 2018. Concentrations remained stable in 2019 and 2020. At times in 2021, molybdenum concentrations were above the historical mean. This was caused by an extended summer shutdown of the water treatment plant and increased water treatment flows of influent to the water treatment plant. Overall, the molybdenum concentrations during the care and maintenance period remained stable. Also, the increase in the mean annual concentration (to 0.213 mg/L) was small compared to the historical mean (0.185 mg/L). In the absence of a limit for molybdenum, CNSC staff use ERA predictions that is specific for each site.

Releases of molybdenum at the RLO remain below the ERA predictions and the concentrations in the receiving environment are below the provincial surface water quality objectives.

Throughout care and maintenance, mean concentrations of selenium have shown a significant decrease. When RLO was first placed in care and maintenance, uranium concentrations in treated effluent started to increase. In response to this increase, RLO adjusted the reagents added to the water treatment process. As a result, since the second half of 2017, uranium concentrations in treated effluent have generally improved and have been below historical mean during the 2018 to 2021 period.

CNSC staff are satisfied that Cameco is taking the appropriate measures to effectively control and reduce uranium, molybdenum and selenium in effluent.

Annual monthly mean concentrations of treated effluent

The annual monthly mean concentrations and associated licence limits for the treated effluent are provided in table 3.4. Releases have been substantially lower than the licence limits throughout the review period.

Table 3.4 Concentrations of treated effluent released to the environment from the mine water treatment plant, 2013-2021

Year	Limits	Interim Objective	2013	2014	2015	2016	2017	2018	2019	2020	2021
As mg/L	0.5[4]	N/A	0.0055	0.0056	0.0040	0.0025	0.0010	0.0006	0.0009	0.0009	0.0012
Cu mg/L	0.3[4]	N/A	0.0046	0.0041	0.0030	0.0013	0.0002	0.0003	0.0002	0.0002	0.0002
Pb mg/L	0.2[4]	N/A	0.0001	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Ni mg/L	0.5[4]	N/A	0.0144	0.0184	0.0057	0.0038	0.0017	0.0015	0.0013	0.0013	0.0014
Zn mg/L	0.5[4]	N/A	0.0010	0.0010	0.0010	0.0010	0.0006	0.0006	0.0007	0.0005	0.0009
TSS mg/L	15[4]	N/A	2	2	2	2	1	1	1	1	1
Ra^{226} Bq/L	0.37[4]	N/A	0.008	0.010	0.007	0.007	0.007	0.006	0.006	0.006	0.006
pH[1] units	6.0-9.5[4]	N/A	7.2	7.3	7.4	7.3	7.5	7.5	7.1	7.2	7.3
Se mg/L	0.6[3]	N/A	0.0052	0.0042	0.0042	0.0035	0.0024	0.0026	0.0023	0.0026	0.0025
U mg/L	2.5[3]	0.1	0.063	0.046	0.052	0.073	0.070	0.032	0.027	0.021	0.018
Mo[2] mg/L	N/A	N/A	0.324	0.282	0.268	0.273	0.139	0.180	0.159	0.184	0.213

1 pH taken from daily discharge samples – not measured in monthly composite samples.
2 No provincial or federal limit is available. Level of molybdenum in treated effluent meets the federal water quality guidelines and are below the action level.
3 Provincial limits.
4 Limits as identified in the MDMER.

Uncontrolled releases

Complete listings and descriptions of uncontrolled releases (spills) to the environment at the RLO are included in the uranium mines and mills RORs which are available on the CNSC's website. Information on releases which occurred in 2021 are included in *Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2021*, which was presented at a Commission meeting on December 15, 2022.

There were 4 spills at the RLO in 2021 that were considered low risk. The licensee's corrective actions resulted in there being no negative offsite effects to the environment. The 4 spill events are described below:

- May 11, 2021: A breach in the B-Zone ore pad drainage ditch resulted in the release of an estimated 10.3 m^3 of spring melt water from the perimeter ditch of the ore pad onto the perimeter road and into the surrounding area. The eroded section was rebuilt, a vacuum truck was dispatched to remove water from the ditch to draw down the elevated water level. A pump was placed at the culvert location to transfer water from upgradient to downgradient of the culvert while the culvert was cleared. Impacted soil and roadbed material was removed, and a follow up gamma survey was conducted which verified that impacted material had been effectively removed. The licensee recommended including additional inspections to monitor the berm and assess stability.
- May 26, 2021: It was discovered at the Warehouse Pad 3 Laydown Area that a tote of new engine oil had a cracked drain valve, resulting in a leak of approximately 1.2 m^3 of new oil. The licensee established an earthen berm around the perimeter of the area of downgradient water ponding to prevent any further migration of the released material. Both a vacuum truck and spill pads were deployed to recover as much oil mixed with melted water as possible. Oil was identified at a low point (trench) and recovery in this area involved the use of clean water to flush the oil along and then recovered using the vacuum truck. The area was backfilled after clean-up activities to reduce erosion concerns. The remaining hazardous materials, which were stored outside, have been moved to an area with approved secondary containment.
- May 28, 2021: A separation in the barge line at a fused butt weld at the AGTMF North Pond surface water causing a release of an estimated 2.75 m3 of melt water. Clean-up activities were completed, and contaminated soil was excavated. Follow-up scanning confirmed that the release area remained similar to background conditions and backfill with clean material was completed.
- August 25, 2021: A release of approximately 583 kg of propane at the Eagle Point Sand Dryer. Upon discovery, the licensee's Emergency Response Team (ERT) was dispatched, the area was evacuated, and roadblocks were established to restrict access to the area. The power was shut down to the propane pump and the main propane supply valve was closed, stopping the flow of propane from the tank to the pump. The leaking section of piping was then isolated, thereby stopping further release and the remaining propane was

allowed to disperse. The licensee's investigation into this event noted that a failure of the pressure gauge was the cause of the release. A number of corrective actions were identified and assigned, including replacement of the gauge with a higher quality substitute.

Environmental management system

Cameco has implemented and maintained an environmental management system (EMS) at the RLO to describe the activities associated with the protection of the environment. The EMS is described in the environmental management program (EMP) and includes programs for effluent and environmental monitoring. The EMS is in conformance with Cameco's Safety, Health, Environment and Quality Policy and also meets the requirements of the ISO 14001:2015 standard *Environmental Management System – Requirements with Guidance for Use* [16].

Cameco conducts internal audits to determine whether the RLO EMS has been properly implemented and is effective. Any deficiencies and findings that are identified from the internal audit are documented and a plan is devised to address any non-conformance items. Cameco verifies compliance of the RLO EMS through annual management reviews where minutes and follow-up actions to outstanding issues from the internal audits are documented. Cameco sets objectives, goals, and targets related to the EMP every year. The status of these objectives, goals, and targets is evaluated and the results are documented in the annual compliance report for the RLO.

CNSC staff verify the effectiveness of Cameco's EMS at the RLO through desktop reviews of annual compliance reports and inspections. CNSC staff confirmed that Cameco's EMS is meeting expectations.

Assessment and monitoring

The core activity of the EMP is to acquire the data for assessing impacts on the environment from the operation and ensuring that possible impacts are detected as early as possible and mitigated. The environmental monitoring requirements of the EMP provide details about monitoring locations, frequencies and environmental parameters to be measured. The RLO's EMP demonstrates that the site emissions and effluent discharge of nuclear and hazardous substances are properly controlled. Key components of the EMP are air quality, surface water hydrology, water quality, terrestrial monitoring, aquatic monitoring, and groundwater monitoring.

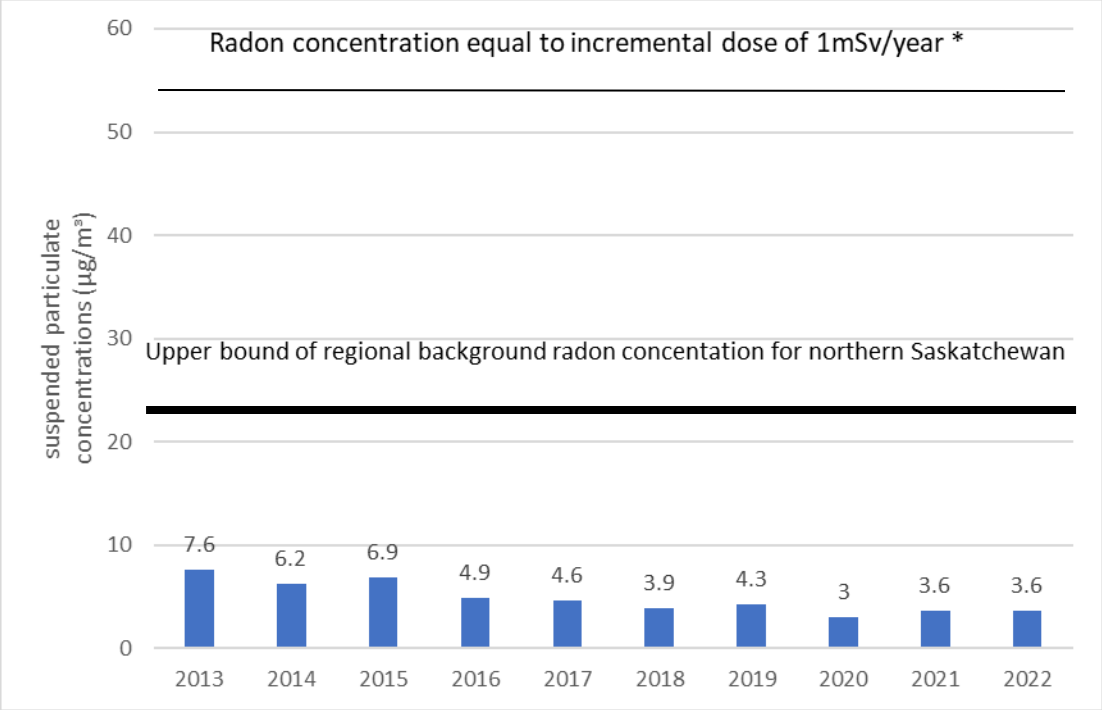
The data collected under the EMPs are compared with predictions in Cameco's ERA to confirm that there is minimal risk to the environment and human health from site emissions and effluent discharge. Additional details and results are provided within the Envrionmental Protection Review Report: Rabbit Lake Operation (EPRR-RLO).

Air monitoring

Cameco also maintains an air and terrestrial monitoring program at the RLO. Air and terrestrial monitoring at the RLO includes ambient radon, total suspended particulate (TSP), sulphur dioxide, soil sampling and lichen sampling to assess the impact of air emissions. It should be noted that during care and maintenance, monitoring of sulphur dioxide in ambient air stopped because the sulphuric acid plant is not in operation.

Radon in ambient air around the RLO is monitored at 19 stations using passive track etch cups (since January 2022 this has been reduced to 15 locations). Figure 3.4 shows that the average concentrations of radon in ambient air from 2013 to 2021 is similar to background concentrations for northern Saskatchewan's regional baseline of less than 7.4 Bq/m^3 to 25 Bq/m^3. The average radon concentrations are less than the reference level of 55 Bq/m^3, which represents an incremental dose of 1 mSv/year above background.

Figure 3.4: Concentrations of radon in ambient air, 2013-2021

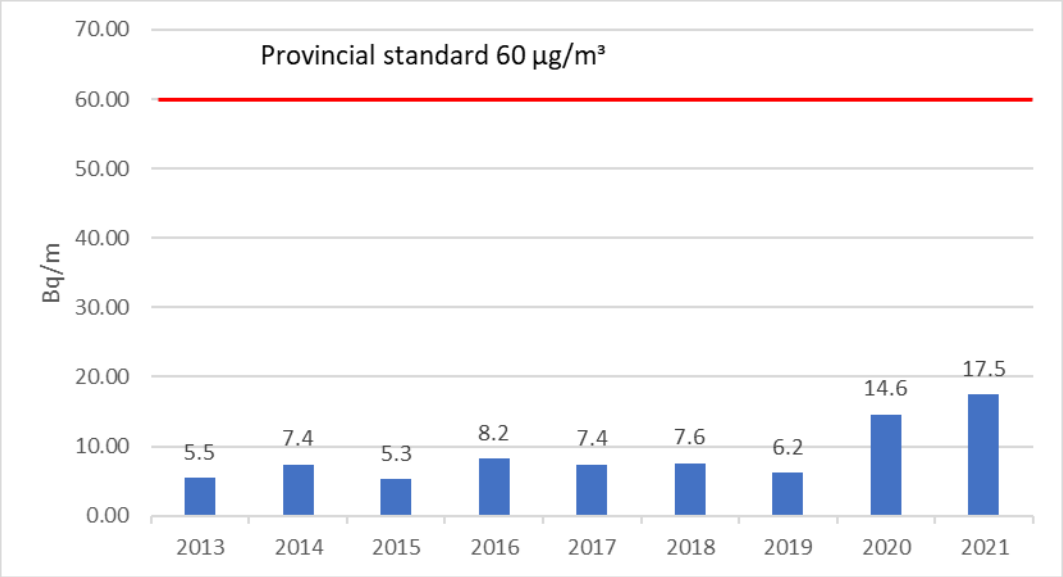


* Upper-bound of the incremental dose of 1 mSv per year above background (i.e., an incremental radon concentration of 30 Bq/m^3 above natural background) based on ICRP Publication 115. Values are calculated as geometric means.

** The 2022 reporting period was not included as radon monitors were only analyzed after September 30, 2022.

Environmental monitoring for dust, particulates and associated contaminants is conducted using high volume sampling units located at each site in the prevailing downwind direction. TSP values remained low and well below the provincial standard of 60 µg/m^3 as shown in figure 3.5.

Figure 3.5: Concentrations of total suspended particulate, 2013–2021



* Values are calculated as geometric mean.
** The 2022 reporting period values are based on January 1, 2022 to September 30, 2022 data.

TSP samples are also analyzed for concentrations of metals and radionuclides. The mean concentrations of metal and radionuclides adsorbed to TSP are low and below reference annual air quality levels identified in table 3.5.

Table 3.5: Concentrations of metals and radionuclides in air, 2013-2022*

Parameter	Reference annual air quality levels**	Minimum	Maximum	Median
As ($\mu g/m^3$)	**0.06** (1)	0.000128	0.000481	0.000280
Ni ($\mu g/m^3$)	**0.04** (1)	0.000007	0.000580	0.0002502
Pb^{210} *** (Bq/m^3)	**0.021** (2)	0.000006	0.000018	0.00001022
Ra^{226} (Bq/m^3)	**0.013** (2)	0.000002	0.000000	0.00000075
Th^{230} (Bq/m^3)	**0.0085** (2)	0.000007	0.000000	0.00000197
U *** ($\mu g/m^3$)	**0.06** (1)	0.00012	0.001960	0.0007547

* The 2022 reporting period values are from January 1, 2022 to September 30, 2022 data.
** Province of Ontario and ICRP reference annual air quality levels are shown for reference only, as no federal or Province of Saskatchewan limits are currently established.
*** The median for both U and Pb^{210} are only from 2013 to 2021 as there was no data available for 2022.
1 Reference annual air quality levels have been derived from *Ontario 24-hour Ambient Air Quality Criteria* (Ontario Ministry of Environment 2012).
2 Reference level has been derived from ICRP 96.

Terrestrial monitoring

Cameco's terrestrial monitoring program at the RLO determines if there is influence on the environment from aerial deposition, as soil and lichen and associated ecological receptors may be affected by atmospheric deposition of particulate and adsorbed metals and radionuclides associated with onsite activities. Cameco executes terrestrial monitoring programs every 10 years in accordance with the EMP.

Soil quality is not predicted to be a significant pathway of exposure for the RLO through either food chain transfer, incidental ingestion, groundshine, or dermal contact for human or ecological receptors.

Soil quality monitoring

Cameco collected soil samples in 2008 from 10 sites within a 5-kilometre radius of the study area, and from 2 reference sites outside the study area. Samples were taken at a depth of 0 to 5 centimeters (cm). Model-predicted soil contaminant concentrations were comparable to measured concentrations and found to be well below their respective soil guidelines.

Soil is largely connected to air emissions through deposition from air, which are limited for the RLO. As such, no soil monitoring program is required as per the provincial approval to operate and the environmental protection program.

During the current licensing period, terrestrial monitoring data were collected in 2019 for lichen; no soil samples were taken during the licensing term.

Lichen Monitoring

Lichen samples are analyzed to determine the level of airborne particulate contaminants deposited on the surface of the lichen as a means of ensuring that a significant level of contamination is not entering lichen consumers, such as caribou. The monitoring results reported in 2019 indicated that most lichen chemistry levels of arsenic, nickel and uranium were consistent compared with those from the reference station, with the exception of the results from station 11. Samples taken from station 11 have consistently been elevated over the course of the monitoring program, reflecting the relatively close proximity to active infrastructure.

CNSC staff concluded that the level of airborne particulate contaminants produced by the RLO is acceptable and does not pose a risk to lichen consumers such as caribou.

Surface water monitoring

Surface water monitoring at the RLO considers the Horseshoe Creek watershed, Parks Lake watershed, and the Link Lakes watershed, which all flow into Wollaston Lake. Collins Bay and Ivison Bay of Wollaston Lake are also taken into consideration for monitoring. Treated effluent is discharged into Horseshoe Creek, which then flows roughly 9 kilometres, via Horseshoe Pond, to discharge into Hidden Bay of Wollaston Lake. Seepage from the AGTMF moves in 3 directions; namely northward toward a wetland area (consisting of both constructed and natural wetland features) with discharge into the north end of Parks Lake, eastward through the ridge that separates the facility from Parks Lake with discharge along the west shoreline of Parks Lake, and southward toward Horseshoe Creek.

The results of CNSC staff's assessment of the water quality are provided in the EPRR-RLO, and are summarized here:

Surface water quality was consistent at the 3 stations sampled in Collins Bay and constituents of potential concern (COPC) concentrations were also similar to those measured upstream of the RLO in Collins Creek. No guidelines were exceeded by any COPC in these areas and trend analyses indicated there have been very few changes in COPCs over the past 10 years. However, in the flooded B-Zone pond, metal concentrations (i.e., arsenic, molybdenum, nickel, and uranium) decreased significantly over the last 10 years whereas ions, nutrients, and physical parameters had increased significantly. Some arsenic concentrations and all nickel concentrations continued to exceed guidelines, which is consistent with historical results and ERA predictions. In Ivison Bay, no guidelines were exceeded and COPC concentrations have remained relatively unchanged in the last 10 years, although there has been a significant decrease in molybdenum.

In the Link Lakes drainage, concentrations of COPC in surface water were highest in Upper Link Lake and lowest in Pow Bay of Wollaston Lake, illustrating a downstream gradient. Uranium and radium-226 concentrations in Upper Link Lake and uranium concentrations in Lower Link Lake continued to

exceed guidelines, which is consistent with historical results and ERA predictions, and are expected to drop below guidelines within the next decade. These concentrations are due to historical practices (i.e., drainage of the mineralized and clean waste rock piles through open channels until the mid-1990s) and historic contributions (i.e., mine slimes from the 1970s) [10]. Trend analyses indicated there were significant decreases in the concentrations of numerous COPCs in the Link Lakes drainage over the past 10 years, including molybdenum concentrations at all stations. In Pow Bay, COPC concentrations measured were low and below guidelines.

Water quality monitoring in the Horseshoe Creek drainage has shown statistically significant declines in most COPC concentrations from 2010 to 2019. The decreases reflect various initiatives that were implemented to reduce concentrations of molybdenum, selenium, and uranium in treated effluent. As expected, there was a decreasing gradient of COPC concentrations from upstream to downstream; in other words, water quality guidelines continued to be exceeded for many COPCs within Horseshoe Creek and Horseshoe Pond and continued to be below guidelines in Hidden Bay. In the Parks Lake drainage, concentrations of COPCs were below *Saskatchewan Environmental Quality Guidelines*, other than pH, which is naturally low in the drainage gradient.

Environmental effects monitoring

Environmental effects monitoring at Saskatchewan uranium mines and mills is necessary to meet the requirements of the MDMER as well as any additional requirements from CNSC and SMOE.

CNSC staff reviewed the aquatic monitoring data and analysis, along with any other routine or special investigations from Cameco's ERA and confirmed that the impacts to the receiving aquatic environment and biota were within the predictions [10] and that there is minimal risk to the aquatic environment.

Based on these reviews, CNSC staff have found that the aquatic environment remains protected from radiological and hazardous releases from the RLO.

CNSC Independent Environmental Monitoring Program

The CNSC implemented its Independent Environmental Monitoring Program (IEMP) as an added measure of verification that the public, Indigenous Nations and communities, and the environment around licensed facilities are protected. It is separate from, but complementary to, the CNSC's ongoing compliance verification program. The IEMP involves taking samples from public areas around the facility and measuring and analyzing the amount of radiological (nuclear) and hazardous substances in those samples. In August 2022, samples of surface water, fish (trout, lake whitefish, and northern pike), Labrador tea and blueberries were collected in publicly accessible exposure and reference locations in the vicinity of the RLO.

Similar to previous IEMP campaigns in northern Saskatchewan, CNSC staff developed a sampling plan in consultation with interested Indigenous Nations, communities and organizations. CNSC staff consulted with the Ya'thi Néné Land and Resource Office, and the Métis Nation of Saskatchewan. Both reviewed the draft sampling plan and provided suggestions, including sampling locations where traditional activities occur and species of interest, such as lake trout. CNSC staff incorporated their suggestions in the final sampling plan.

CNSC staff accompanied CanNorth on the sampling trip which occurred during the summer of 2022 (figure 3.6). In addition, a community land technician from the Ya'thi Néné Land and Resource Office joined the team to assist in the sample collection and to learn about the IEMP.

Figure 3.6: IEMP water and fish sampling at Wollaston Lake, 2022

Source: CNSC

The samples were analyzed for radionuclides, including radium-226, thorium-230, polonium-210, and lead-210, and hazardous substances including arsenic, copper, lead, molybdenum, nickel, selenium, uranium, and zinc. These parameters were chosen because they had the most regulatory and public interest based on operations at the RLO. The samples are being analyzed by a laboratory that is accredited by the Canadian Association for Laboratory Accreditation Inc. for environmental testing procedures.

Sampling results will be available on the CNSC's IEMP web page by April 2023 and an IEMP brochure with the results will be created and shared with interested Indigenous Nations and communities. The IEMP results from 2022 are consistent with the results submitted by Cameco, supporting CNSC staff's assessment that Cameco's environmental protection programs are effective. The results add to the body of evidence that people and the environment in the vicinity are protected and that there are no anticipated health impacts from the operations.

Protection of people

Cameco is required to demonstrate that the health and safety of the public and Indigenous Nations and communities are protected from exposures to hazardous and nuclear substances released from the RLO. The effluent and environmental monitoring programs currently conducted by Cameco at the RLO are used to confirm that releases of hazardous substances do not result in environmental concentrations that may affect public health.

CNSC receives reports of discharges to the environment through the reporting requirements as per the regulations and outlined in the RLO licence and LCH. CNSC staff's review of discharges to the environment confirmed that these releases are below regulatory limits and are within those predicted in the environmental assessments and ERAs, which concluded negligible risks to the environment, the public and Indigenous Nations and communities.

Estimated dose to the public

Radiological releases to the environment are controlled and monitored by the effluent and emissions control, and the environmental monitoring programs. The *Radiation Protection Regulations* (RPR) require licensees to implement an RP program for the protection of the public. The focus for RP within the environmental protection framework is on radiological protection of the environment and the public.

The RPR define prescribed dose limits for workers and members of the public, and require doses to be monitored by direct measurement or by estimation of the quantities and concentrations of any nuclear substance released as a result of a proposed activity.

Licensees must meet the requirements of the NSCA and the regulations for radiological protection of members of the public. Accordingly, a human health risk assessment is completed for both radioactive and hazardous substances as part of the ERA. Cameco completed a human health risk assessment in 2020 for the RLO which concluded that the highest estimated annual dose to a public

receptor is 0.1212 mSv for a camp worker. The majority of the incremental radiation dose for the camp workers comes from radon exposure. CNSC staff reviewed Cameco's assessment and concluded that public doses are well below the annual public dose limit of 1 mSv.

Environmental risk assessment

Cameco submitted an Environmental Risk Assessment (ERA) in 2015 and 2020 for the RLO [10, 17], as per CSA standard N288.6-12, *Environmental Risk Assessment at Class I Nuclear Facilities and Uranium Mines and Mills* [13]. CNSC staff reviewed the ERA and determined that it was in compliance with this standard.

As part of the ERA, Cameco completed a human health risk assessment which evaluated numerous human receptors (including workers and families using the site in various ways) and found that human exposure to radionuclides and hazardous substances are not expected to pose a risk to human health under the assessed project scenario. In the case of hazardous substances, CNSC staff's review of the human health risk assessment indicated that hazardous releases from the RLO pose a negligible risk to human health (that is, potential risk to humans is similar to health outcomes in similar northern Saskatchewan communities).

Based on assessments conducted for the RLO, including the review of the 2020 ERA, annual reports, and annual environmental monitoring data, CNSC staff have found that impacts to the human environment from radiological and hazardous substances released from the RLO are negligible and thus, no adverse effects are predicted due to the releases from the site.

Overall, the results of the 2020 ERA are consistent with previously approved ERAs and demonstrate that the environment and human health in the vicinity of the operation remain protected. This conclusion is consistent with the conclusions of the environmental impact statements and risk assessments that describe the site licensing basis for the RLO. CNSC staff have accepted the conclusions from the 2020 ERA.

3.9.3 Summary

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

3.9.3.1 Past Performance

Cameco has developed, implemented and maintained an effective environmental protection program at the RLO that protects the environment and the public in accordance with CNSC regulatory requirements. During the current licensing period, monitored releases to the environment were generally well below licence limits specified in the CNSC licence and in the LCH, as well as in the provincial approvals. CNSC staff monitor implementation of the environmental protection program through compliance verification activities. CNSC staff rate Cameco's overall performance at the RLO for this SCA as satisfactory for the current licence period.

3.9.3.2 Regulatory Focus

CNSC staff will continue to monitor performance in this area through regulatory oversight activities, inspections, and desktop reviews of Cameco's compliance reporting and revisions to relevant program documentation pertaining to this SCA. CNSC staff conducted 4 environmental protection focused inspections at the RLO (August 2015, September 2016, July 2017 and July 2022). In addition, environmental protection criteria were included in 14 inspections for the RLO during the current licence period. All non-compliances were of low safety significance and have been adequately addressed.

The results of these inspections allowed CNSC staff to conclude that Cameco's implementation of the environmental protection programs at the RLO meet CNSC's regulatory requirements and expectations.

3.9.3.3 Proposed Improvements

In March 2021 the CNSC issued REGDOC-2.9.2, *Controlling Releases to the Environment* in draft form for public consultation. This document, sets out the CNSC's requirements and guidance for controlling releases to the environment, through:

- applying the concept of best available technology and techniques, economically achievable
- establishing and implementing licensed release limits and action levels for releases to the environment
- commissioning a treatment system and confirming performance
- implementing adaptive management where required

This draft regulatory document was presented to the Commission in September 2022, and as an outcome, the Commission has directed CNSC staff to undertake further consultation with parties who may be impacted by the regulatory document if published. CNSC staff are undertaking this consultation and expect to return before the Commission in 2023. After this regulatory document is finalized, and subject to approval by the Commission, it is expected that Cameco will implement the document during the proposed licence term. This could lead to the creation and implementation of site-specific action levels and release limits for COPCs at the RLO or determine that the current limits are protective of the environment.

CNSC staff, as part of on-going compliance activities, will review any proposed modifications to Cameco's EMP documentation to ensure effective implementation with updates to CSA Group standards and CNSC's regulatory framework.

3.9.4 Conclusion

Cameco has implemented and maintained an environmental protection program around the RLO that adequately protects the environment and the public in accordance with regulatory requirements. No adverse effects are expected on human health during operation.

Cameco's environmental protection program at the RLO continues to be effective in protecting the environment and minimizing adverse impacts to human health. As documented in the EPRR-RLO, CNSC staff have found that the potential risks from radiological and hazardous releases to the atmospheric, aquatic, terrestrial and human environments from the operations are low to negligible. The potential risks to the environment from these releases are similar to natural background, and the potential risks to humans health are indistiguishable to health outcomes in similar northern Saskatchewan communities. CNSC staff have found that Cameco has and will continue to implement and maintain effective environmental protection measures to adequately protect the environment and the health and safety of persons.

3.10 Emergency Management and Fire Protection

The emergency management and fire protection SCA covers emergency plans and emergency preparedness programs that exist for emergencies and for non-routine conditions.

This SCA also includes the requirement for Cameco's RLO to have a comprehensive fire protection program to minimize the risk to the health and safety of persons and to the environment from fire through appropriate fire protection system design, fire safety analysis, fire safe operation and fire prevention.

The specific areas that comprise this SCA at the RLO that are addressed individually in this document are:

- emergency preparedness and response
- fire protection

3.10.1 Trends

The following table indicates the overall rating trends for the emergency management and fire protection SCA over the current licensing period:

TRENDS FOR EMERGENCY MANAGEMENT AND FIRE PROTECTION									
Overall Compliance Ratings									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
The RLO has an acceptable emergency preparedness and response program that meets CNSC regulatory and performance requirements. Cameco's fire protection program is in place to minimize both the probability of occurrence and the consequences of fire and meets CNSC regulatory requirements.									

3.10.2 Discussion

Emergency preparedness and response

Uranium mines and mills are required to have emergency plans in place for the protection of the health and safety of workers, the public and the environment. Cameco's emergency response program and emergency response plan contain the necessary guidelines and responsibilities for a RLO staff response should an emergency occur. The plan identifies the onsite emergency response organization members and their duties and responsibilities for responding to emergencies. The plan also specifies the required equipment to be used in responding to such emergencies, maintenance of equipment and detailed response procedures. The emergency response plan addresses both general emergency response and firefighting response procedures.

As required by the CNSC and also by Saskatchewan's *The Mines Regulations, 2018*, Cameco must train emergency response team (ERT) members. Cameco utilizes classroom and field training as well as drills and exercises to ensure the preparedness of licensee personnel and the ERT and mine rescue team (MRT). The knowledge and performance for the ERT and MRT are tested during planned emergency exercises. Ongoing field training includes drills and exercises to ensure the preparedness of site personnel. To test specific skills, the ERT and MRT are mobilized for events such as medical emergencies and transportation of ill or injured personnel, rescue drills, fire drills with search and rescue, ventilation and fire suppression activities. As well, Cameco's ERT and MRT trains for, and regularly competes in, emergency mine rescue and industrial fire and response competitions.

CNSC staff verified Cameco's implementation of its emergency response program at the RLO in accordance with CNSC regulatory requirements through inspections and desktop reviews during the current licence period.

Fire protection

Cameco has fire protection programs in place at the RLO to minimize both the probability of occurrence and the consequences of fire at the facility. The program has been established to comply with the requirements of the *National Building Code of Canada* and the *National Fire Code of Canada*, subject to exclusions and or amendments, as contained in Saskatchewan's *Codes Adoption 2015*.

Cameco maintains a fire safety plan at the RLO that describes the facilities, systems, activities and training designed to prevent the outbreak of fire, to protect the health and safety of all persons and to minimize the loss of property in the event of a fire. The fire safety plan is a province of Saskatchewan requirement of the *Occupational Health and Safety Regulations* and the *National Fire Code of Canada*. The province administers fire protection requirements in accordance with *The Mines Regulations, 2018* that provides specific requirements applicable to mines including underground workings.

The fire safety plan provides information on specific responsibilities, emergency instructions in the event of a fire, training provided to personnel during orientation, fire protection inspections, execution of fire drills, description of how fire hazards are controlled and descriptions of specific fire hazards at the site. The fire safety plan is reviewed annually at a minimum.

The maintenance, tests and inspections performed on the fire protection system at the RLO is designed to meet the requirements of the *National Fire Code of Canada*, *National Building Code of Canada*, applicable *National Fire Protection Association* standards, provincial regulations and Occupational Health and Safety Assessment Series (OHSAS):18001 standards. Cameco utilizes a third-party consultant to review proposed projects with potential impact to fire protection. The third-party consultant evaluates the proposed change(s), assesses its potential fire hazards, appropriate fire protection system and features used to mitigate the fire hazards. These third-party reports were submitted to and reviewed by CNSC staff.

The objective of the fire hazard assessments is to demonstrate that a comprehensive assessment has been made of the potential fires and that its impacts on people, equipment, buildings and the environment are within acceptable limits. This was accomplished by demonstrating that the fire protection objective for a facility, as defined by the CNSC, can be met under foreseeable fire events.

As required by CNSC staff, a fire hazard assessment was initiated in 2010 at the RLO by a third-party consultant for buildings at the site. At the request of CNSC staff, additional assessment work was completed in 2011 and the consultant submitted a Fire Hazard Analysis report in 2013 [18]. The report was reviewed by CNSC staff and found to be acceptable.

A third-party fire hazard assessment was performed in 2021; this report was received by Cameco in December 2022. Upon receipt, CNSC staff will review this recent report to determined whether it meets regulatory requirements.

3.10.3 Summary

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

3.10.3.1 Past Performance

Emergency preparedness program

Based on CNSC staff's desktop reviews and inspections, CNSC staff concluded that Cameco's emergency preparedness program continues to be satisfactory at the RLO. Cameco continues to improve its emergency preparedness and response program including implementing lessons learned from exercises and drills.

Fire protection program

Cameco's RLO has an acceptable fire protection program in place to minimize both the probability of occurrence and the consequences of fire. The content of the fire protection program contains elements that would be expected for a mine/mill facility and comply with the requirements of the *National Building Code of Canada* and the *National Fire Code of Canada*, subject to exclusions and/or amendments, as contained in Saskatchewan's *Codes Adoption 2015*.

In conclusion, Cameco's fire protection programs and their implementation at the RLO continue to meet regulatory requirements.

3.10.3.2 Regulatory Focus

CNSC staff completed focused emergency management and fire protection inspections in December 2014, June 2016 and July 2017 at the RLO. Emergency management and fire protection criteria were also included in 7 inspections conducted by CNSC staff at the RLO during the current licence period. All non-compliances identified were of low safety significance and have been adequately addressed.

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

Saskatchewan Ministry of Labour Relations and Workplace Safety, under its agreement with Employment and Social Development Canada and the CNSC, also conduct regular compliance inspections including fire protection. Inspection reports are shared with the CNSC and the Saskatchewan Ministry of Labour Relations and Workplace Safety, and regular oversight is provided by CNSC staff as needed.

3.10.3.3 Proposed Improvements

During the current licence term, Cameco was requested by CNSC staff to submit a gap analysis and implementation plan for CSA standard N393, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* [19] by May 31, 2022. Cameco submitted the request analysis and implementation plan. CNSC staff reviewed Cameco's response and are satisfied with its gap analysis and the proposed implementation timeline

For the proposed licence term, CNSC staff added regulatory document CSA N393 as compliance verification criteria to the draft LCH for the RLO. CNSC staff requested Cameco to submit a gap analysis and implementation plan for CSA N393. CNSC staff reviewed Cameco's submitted gap analysis and implementation plan and are satisfied with Cameco's proposed timeline of December 31, 2023. CNSC staff will continue to monitor implementation through regulatory oversight activities including inspections and desktop reviews of Cameco's compliance reporting on this matter.

3.10.4 Conclusion

As part of the licence renewal application, revised emergency preparedness and fire protection program documents and associated procedures were submitted by Cameco to meet applicable regulatory requirements. CNSC staff performed a desktop review of the documents and identified some gaps. Cameco addressed CNSC staff comments satisfactorily and in a timely manner.

Based on desktop reviews and inspections, CNSC staff concluded the overall performance for this SCA is satisfactory and that Cameco is qualified to carry out the authorized activities at the RLO for this SCA.

3.10.5 Recommendation

CNSC staff recommend that the 2 licence conditions (10.1 and 10.2) associated with this SCA in the RLO licence be retained without change.

3.11 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 or placed into long-term storage on site. This area also covers the planning for decommissioning.

The specific areas that comprise this SCA addressed individually in this document are:

- ore and/or waste rock piles
- waste management facilities
- solid and liquid wastes
- decommissioning plans

3.11.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
The RLO waste management program is adequate for the management of domestic, industrial and chemically/radiologically contaminated waste. CNSC staff monitor Cameco's implementation of this program through compliance verification activities. The RLO has a valid preliminary decommissioning plan in place, which was accepted by CNSC staff and the financial guarantee has been accepted by the Commission. CNSC staff are satisfied with Cameco's waste management program at the RLO and its implementation.									

3.11.2 Discussion

The CNSC requires the licensees of uranium mines and mills to have in place a waste management program for generation, transport, handling, processing, storing, or disposing of the wastes that are produced as a result of licensed activities. The CNSC requires Cameco to take all reasonable precautions for the safe management of waste to protect workers and the environment and to control releases of nuclear and hazardous substances.

Cameco has implemented a waste management program to effectively control wastes generated and stored at RLO. The objective of the program is to minimize the generation of waste at the facility and dispose of wastes and by-products generated in accordance with CNSC regulatory requirements. The RLO waste management program referenced in the LCH describes how waste is managed throughout its lifecycle to the point of disposal. This includes waste generation, storage, processing, recycling and removal/transfer activities.

Waste management facilities at the RLO include the following:

- storage areas for mineralized and potentially acid-generating waste rock
- clean waste rock and overburden piles
- contaminated industrial waste storage
- storage and recycling facilities for hazardous wastes
- landfill for uncontaminated industrial and domestic waste
- domestic sewage treatment.

Ore and/or waste rock piles

Eagle Point waste rock stockpile

During production, clean waste rock removed from the Eagle Point mine is stored on a storage pad located on surface, adjacent to the mine portal. The waste rock storage pad is constructed of till and has a footprint of 80,000 square metres (m^2). The till pad is compacted and sloped to a lined sump located in the southwest corner of the pad. The pad was designed to contain the probable maximum precipitation event. Precipitation that collects in the sump is pumped into the sedimentation pond and is delivered to the mill for treatment. Clean waste rock stored on the pad may be used as backfill underground, while crushed clean waste rock may be used for alternate purposes such as underground road development and surface construction activities.

West #5 waste rock pile

The West #5 waste rock pile was generated during the RLO open pit mine development. The material in the stockpile consists of predominantly clean waste rock and overburden tills and organics generated during mine development. There is approximately 7,890,000 m^3 of waste rock stored with a footprint of 407,000 m^2. The pile is no longer used for the active storage of waste rock.

Mineralized waste stockpile #2

Mineralized waste stockpile (MWS) #2 is situated approximately 100 metres (m)southwest of the RLO mill complex. A portion of this stockpile underlies the mill ore pad. MWS #2 is primarily till and waste rock. Waste rock in this pile has an estimated average grade of 0.033%U_3O_8. The stockpile has a surface area of approximately 43,000 m^2.

Mineralized waste stockpile #3

Mineralized waste stockpile #3 is located 250 m west of the RLO mill complex. This stockpile has a surface area of approximately 110,000 m^2.

The material stored on the stockpile is mainly till overburden with some waste rock. MWS #3 contains approximately 167,000 m^3) of waste rock and has an estimated average grade of 0.041% U_3O_8.

Mineralized waste stockpile #36

Mineralized waste stockpile #36 is located approximately 450 m west of the Rabbit Lake In-Pit Tailings Management Facility (RLITMF), on a portion of the West #5 waste rock pile (south end). The material on this stockpile is primarily waste rock that is relatively high in carbonate. The waste rock in this pile has an estimated average grade of 0.046% U_3O_8. There are approximately 630,000 $m^3$of special waste rock in MWS #36, covering a surface area of approximately 92,000 m^2.

High carbonate low-grade ore area

The high carbonate low-grade ore area is located immediately west of the mine water pond. This area contains high carbonate low-grade ore from historical mining activities at the RLO. When the RLO was in production, this material had been fed into the mill feed. The high carbonate low-grade ore area has a footprint of 18,000 m^2.

B-Zone ore pad

When the RLO is in production, the B-Zone ore pad is subject to a sorting process where separate stockpiles are segregated into special waste rock and ore. The B-Zone ore pad provides for ore storage prior to being hauled to the mill for processing. Ore and special waste rock extracted from the Eagle Point mine, sedimentation pond sludge and material removed during reclamation of the B-Zone perimeter road is stockpiled on the B-Zone ore pad. The B-Zone ore pad has a footprint of 175,000 m^2. The pad is surrounded by a perimeter ditch that directs water to a sump area for collection and eventual treatment in the mill. The rejected special waste rock (typically coarse fraction) is stockpiled on the B-Zone ore pad. This waste rock can be hauled to Eagle Point and used as backfill.

Mill ore pad

The mill ore pad was constructed in 1994 as a replacement for the original unlined ore storage area. The upper 1 m of till material beneath the original ore storage area liner was excavated before placement of the new bentonite-amended till liner and sand drainage layer. The excavated till material was used as a protective cover on top of the sand drainage blanket. The mill ore pad has a footprint of 14,000 m^2. When the RLO is in production, the mill ore pad is used to store ore until it is processed in the mill.

Eagle Point ore pad

The Eagle Point ore pad was constructed in a manner similar to the mill ore pad and has a footprint of 20,000 m^2. When RLO is in production, this pad is used for storage of ore from the mine until it is ready to be processed in the mill or transported to the B-Zone ore pad. This pad is used to store special waste and other contaminated industrial waste materials removed from the mine.

Reclaimed waste rock stockpiles

A-Zone waste rock pile

The A-Zone waste rock pile was contoured as part of A-Zone pit backfilling in 1998. The area was vegetated as part of revegetation activities in 1998. No further active reclamation work is anticipated in this area.

B-Zone waste rock pile

The majority of reclamation activities for the B-Zone waste rock pile have been completed. The B-Zone waste rock pile will continue to undergo general maintenance and monitoring activities, as required, prior to final decommissioning.

D-Zone waste rock pile

The D-Zone waste rock pile was hydroseeded in 2010 and planted with birch and black spruce seedlings. Additional seed and fertilizer application was conducted in 2017 as well as the planting of alders in 2021. No further active reclamation work is anticipated in this area.

East #5 waste rock pile

No waste rock remains within the former East #5 waste rock pile. The footprint area has been contoured and revegetated. No further reclamation work is anticipated in this area.

Mineralized waste stockpile #9

Mineralized waste stockpile #9 no longer exists; it has been processed in the RLO mill. The base area of the pile will be scanned to ensure compliance with applicable criteria as part of overall site waste rock decommissioning.

North waste rock pile

Decommissioning and reclamation activities associated with the North waste rock pile are complete. No further reclamation work is anticipated in this area.

Waste management facilities

Tailings management facilities

There are 2 tailings management facilities at the RLO. An above-ground facility, referred to as the AGTMF, primarily contains tailings generated from milling of ore from the RLO deposit. A second in-pit facility, known as the RLITMF, contains tailings produced during the processing of B-Zone, D-Zone, A-Zone, Eagle Point and stockpiled RLO ore and is the disposal location for water treatment precipitates generated through the mill water treatment process.

Above ground tailings management facility

The AGTMF is located on the southern portion of the RLO site. The AGTMF covers an area of approximately 53 hectares and contains approximately 6.5 million tonnes of tailings deposited between 1975 and 1985. The tailings contained within the facility were derived from the processing of the original RLO ore deposit. The tailings within the AGTMF are confined by earth-filled dams at the north and south ends and natural bedrock ridges along the east and west sides. Activities currently performed at the AGTMF are limited to surface water management, toe drain water management and contaminated waste placement.

Rabbit Lake in-pit tailings management facility

The RLO pit was converted to a tailings management facility in 1985, utilizing an engineered pervious surround system. Since commissioned, the RLITMF has been used as a tailings repository for ore mined from the RLO B-Zone, D-Zone, A-Zone, Eagle Point and stockpiled Rabbit Lake ore. The total tailings capacity for the RLITMF is approximately 9.0 million m^3 with a footprint of 220,000 m^2.

In 2012, a till barrier was added to the pervious surround system to allow for the formation of a surface pond overlying tailings placed in the RLITMF. The surface pond prevents the formation of buried frozen tailings layers during the winter months by allowing for injection of tailings into a surface pond below ice cover. The underdrain and side drain system allows tailings pore water and surface pond seepage to be captured and removed for treatment, promoting tailings consolidation during operations. During periods of suspended production, surface pond levels do not need to be maintained due to the low volume of water and solids deposited to the facility.

A pervious surround system surrounds the facility and allows for tailings water and surrounding groundwater to be collected and pumped to the mill for treatment via a raise dewatering system. Following decommissioning and cessation of raise dewatering, this highly permeable pervious surround enveloping the densely consolidated tailings mass, will allow groundwater flowing towards the RLITMF from outside the facility to preferentially flow through the surround and around the tailings mass, resulting in significantly reduced flow through the tailings.

Solid and liquid wastes

Industrial, radiologically contaminated, chemically contaminated, dangerous goods and domestic wastes are generated in both liquid and solid forms at the RLO. Waste management systems have been implemented at the site to track and control the appropriate disposition of contaminated and non-contaminated wastes.

Decommissioning plans

In accordance with paragraph 3(a)(viii) of the UMMR and CNSC REGDOC-2.11.2, *Decommissioning*, the CNSC requires Cameco to maintain a decommissioning plan throughout the lifecycle of the RLO. The CNSC and Saskatchewan Ministry of Environment (SMOE) staff work closely to ensure regulatory requirements are met. A memorandum of understanding with the province of Saskatchewan guides the nature of the cooperation between the parties [20]. The financial guarantee must be reviewed and updated every 5 years, or if there are material changes to the licensee's operational activities. Although both the CNSC and SMOE require financial guarantees to be established, in accordance with a memorandum of understanding between the agencies, SMOE holds the financial instruments associated with the financial guarantee for uranium mine/mill sites in Saskatchewan.

To fulfill the 5-year update requirement, in May 2018, Cameco submitted a request to the CNSC to update their financial guarantee for the RLO. Cameco submitted its Preliminary Decommissioning Plan (PDP) and Preliminary Decommissioning Cost Estimate. The PDP must remain current to reflect any changes in the facility or operations and meet the requirements of CSA standard N294-09, *Decommissioning of Facilities Containing Nuclear Substances* [22].

Following reviews by SMOE and CNSC staff, the financial instruments were found to be acceptable, and the PDP and Preliminary Decommissioning Cost Estimate were confirmed to be credible for future decommissioning of the RLO.

CNSC staff determined that the decommissioning activities, which will take place in a staged manner over years, and the cost estimate, which includes contingency funds, are robust.

This request included a proposed revision to the value of Cameco's financial guarantee from C$202.7 million to C$213.4 million which was approved by the Commission on March 9, 2021 [1,2].

Therefore, the proposed financial guarantee remains sufficient to cover the decommissioning liabilities. In addition, the value of the proposed financial instrument remains constant and is not dependent on the market outcome.

On December 15, 2022, Cameco submitted an updated PDP and Preliminary Decommissioning Cost Estimate to CNSC staff and SMOE for review. In addition to meeting the requirements of CSA N294-09 [22], the submission must also meet the requirements of CNSC's REGDOC-2.11.2, *Decommissioning*, which was published in January 2021. The documents are currently undergoing review and should they be deemed acceptable by CNSC staff and SMOE staff, a CMD will be prepared for the Commission's consideration of the reviewed financial guarantee.

3.11.3 Summary

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

3.11.3.1 Past Performance

Through the review of waste management documentation and inspections during the current licence period, CNSC staff concluded that Cameco's RLO waste management program meets regulatory requirements.

For the current licence period, CNSC staff rated Cameco's overall performance for the waste management SCA at the RLO as satisfactory.

3.11.3.2 Regulatory Focus

CNSC staff completed focused waste management inspections in May 2015 and July 2022 at the RLO. Waste management criteria was also included in 8 inspections conducted by CNSC staff at the RLO during the current licence period. All non-compliances identified were of low safety significance and have been adequately addressed.

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

3.11.3.3 Proposed Improvements

There are no proposed improvements for this SCA.

For the proposed licence term, CNSC staff added the following recently established regulatory documents as compliance verification criteria to the draft LCH for the RLO:

- REGDOC-2.11.1, *Waste Management, Volume I: Management of Radioactive Waste*
- REGDOC-2.11.2, *Decommissioning*
- REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities.*

Cameco's submissions of financial guarantees are required to meet the requirements of REGDOC-3.3.1. Cameco's preliminary decommissioning plan and cost estimate submissions for RLO, which are currently undergoing internal CNSC staff review, are being assessed against this regulatory document.

REGDOC-2.11.1 and REGDOC-2.11.2. have been added as compliance verification criteria to the draft LCH for the RLO. CNSC staff will continue to monitor implementation of these regulatory documents through regulatory oversight activities including inspections and desktop reviews of Cameco's compliance reporting on this matter.

3.11.4 Conclusion

Based on desktop reviews and inspections, CNSC staff have concluded that the overall performance for this SCA is satisfactory, and that Cameco is qualified to carry out the authorized activities at the RLO for this SCA.

3.12 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 are not addressed individually in this document.

3.12.1 Trends

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

TRENDS FOR SECURITY									
Overall Compliance Ratings									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has implemented a security program that meets regulatory requirements under the *General Nuclear Safety and Control Regulations* to prevent the loss or unauthorized removal of nuclear substances, radioactive sources, prescribed equipment or information. CNSC staff monitor Cameco's implementation of this program through compliance verification activities. CNSC staff are satisfied with Cameco's security program and its implementation.									

3.12.2 Discussion

Pursuant to the NSCA and its regulations, Cameco requires programs that will protect the environment, the health and safety of persons, and maintain security.

Cameco maintains a security program (technical and administrative) at the RLO in order to minimize risk to the public, employees, the environment and to protect company assets from sabotage, theft, criminal acts by internal or external agents and potential vulnerabilities.

Based on CNSC staff's review of Cameco's vulnerability at the RLO, the lack of past incidents involving theft and sabotage to the operation, the remote location of the operation, the percentage of long-term employees, and the lack of evidence of any threats to the operation, the security risk is considered low. There is no change to the security threat at the RLO and the security measures currently in place are adequate.

During the current licensing period, no theft of nuclear material from the RLO was reported. A physical inventory of all uranium material is conducted annually by an external auditor, and monthly by Cameco personnel. There is no history of sabotage or any evidence of intent of actual or planned sabotage threats conveyed to CNSC.

CNSC staff have concluded that the security measures are sufficient to address the current threat level.

3.12.3 Summary

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

3.12.3.1 Past Performance

Cameco's RLO implemented a security program that meets regulatory requirements. CNSC staff monitor implementation of this program through compliance verification activities.

During the current licence period, there have been no thefts or any evidence of malicious acts or planned sabotage against nuclear substances at the RLO.

3.12.3.2 Regulatory Focus

Cameco's RLO is required to meet the applicable requirements of sections 3 and 12 of the GNSCR and section 3(e) of the UMMR. The regulations require reasonable measures and precautions be in place to: maintain site security; implement means for alerting the licensee in the event of illegal use, illegal removal, sabotage or attempted sabotage; and train workers on the security program at the licensed site.

CNSC's REGDOC-2.12.3, *Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material*, Version 2.1, sets out the minimum security measures that must be implemented to prevent the loss, sabotage and illegal use, possession or illegal removal of sealed sources during its entire lifecycle.

Due to the low risk associated with the RLO, a focused security inspection is not scheduled by CNSC staff. However, security criteria were included in 1 inspection conducted by CNSC staff at the RLO during the current licence period. No non-compliances have been observed by CNSC staff.

3.12.3.3 Proposed Improvements

There are no proposed improvements or changes for this SCA.

3.12.4 Conclusion

CNSC staff assessed Cameco's documentation and analyses under the security SCA and have found it to be acceptable. CNSC staff concluded that the overall performance for this SCA is satisfactory, and that Cameco is qualified to carry out the authorized activities at the RLO for this SCA.

CNSC staff also concluded that Cameco has an acceptable security program in place at the RLO 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 Cameco's security program at the RLO, including its implementation, continue to meet regulatory requirements.

3.13 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 Government of Canada and the International Atomic Energy Agency (IAEA) safeguards agreements as well as other measures arising from the *Treaty on the Non-Proliferation of Nuclear Weapons.*

The scope of the non-proliferation program for this licensee is limited to the tracking and reporting of foreign obligations and origins of nuclear material. This tracking and reporting assists the CNSC in the implementation of Canada's bilateral Nuclear Cooperation Agreements with other countries. 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 subsection 3(2) of the GNSCR.

The specific areas that comprise this SCA are not addressed individually in this document.

3.13.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO continues to implement and maintain an effective program for safeguards measures and nuclear non-proliferation commitments arising from Canada's international obligations under the *Treaty on the Non-Proliferation of Nuclear Weapons.* CNSC staff are satisfied with Cameco's program for safeguards measures and meeting nuclear non-proliferation commitments.									

3.13.2 Discussion

CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations. Cameco has an effective safeguards program at the RLO 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*.

Pursuant to that treaty, Canada has entered into a Comprehensive Safeguards Agreement and Additional Protocol with the IAEA (here-in after, the safeguards agreements). The objective of the 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 nuclear material or activities.

The CNSC provides the mechanism, through the NSCA, regulations and a licence condition, for the IAEA to implement the safeguards agreements at the RLO. Conditions for the application of IAEA safeguards are contained in the operating licence and criteria in order to meet the conditions contained in the LCH and in CNSC's REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*. Compliance includes the timely provision of reports on the movement and location of all nuclear materials, operational records, and access and assistance to IAEA inspectors for safeguards activities.

To comply with the safeguards agreement, Cameco's RLO ensures that:

- controlled nuclear substances exports or imports follow appropriate permitting and licensing
- operational records are maintained
- required information is provided and an annual update for the IAEA additional protocol is submitted to the CNSC

The RLO has been subject to complementary access inspections by the IAEA in the past, however none were performed during the current licensing period.

3.13.3 Summary

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

3.13.3.1 Past Performance

During the current licence period, Cameco provided CNSC staff with documentation required for the implementation of the safeguards agreement.

Cameco's programs for safeguards and non-proliferation at the RLO continues to meet CNSC requirements and expectations.

3.13.3.2 Regulatory Focus

CNSC staff will continue to monitor performance through participation in IAEA activities and through CNSC regulatory oversight activities independent of the IAEA. Monitoring will include inspections and desktop reviews of Cameco's compliance with reporting and revisions to relevant program documentation pertaining to this SCA.

3.13.3.3 Proposed Improvements

There are no proposed improvements or changes for this SCA.

3.13.4 Conclusion

CNSC staff assessed the RLO'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 Cameco is qualified to carry out the authorized activities at the RLO for this SCA.

3.14 Packaging and Transport

The packaging and transport SCA covers programs for the safe packaging and transport of nuclear substances to and from the licensed facility. The specific areas that comprise this SCA at the RLO are not addressed individually in this document.

3.14.1 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									
2013	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**
SA	SA	SA	SA	SA	SA	SA	SA	SA	SA
Comments									
Cameco's RLO has a packaging and transportation program that ensures compliance with the *Packaging and Transport of Nuclear Substances Regulations, 2015,* and the *Transportation of Dangerous Goods Regulations.* CNSC staff monitor Cameco's implementation of these programs through compliance verification activities. CNSC staff have confirmed that the packaging and transport activities are conducted in a safe manner.									

3.14.2 Discussion

Cameco has developed and implemented a packaging and transport program for activities at all Cameco operated sites to ensure compliance with the *Packaging and Transport of Nuclear Substances Regulations, 2015*, and the *Transportation of Dangerous Goods Regulations* for all shipments to and from the site. Cameco's packaging and transport program also covers elements of package design and package maintenance as required by the regulations.

When the RLO is in production, the yellowcake shipments are transported in accordance with contractual supply requirements. Shipments of yellowcake from site are initiated by Cameco's supply chain management department. The yellowcake is packaged and transported in drums that meet the Industrial Package Type 1 (Type IP-1). These containers meet the regulatory requirements for industrial packages (IP-2) as defined in the *Packaging and Transport of Nuclear Substances Regulations, 2015.*

In support of the licence renewal, Cameco submitted documents related to the packaging and transportation for CNSC staff's review. CNSC staff concluded that Cameco's packaging and transportation documents meet applicable regulatory requirements.

3.14.3 Summary

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

3.14.3.1 Past Performance

Cameco is performing satisfactorily in the packaging and transport SCA at the RLO and continues to demonstrate compliance with the *Packaging and Transport of Nuclear Substances Regulations, 2015* and the *Transportation of Dangerous Goods Regulations*. For the current licence period, CNSC staff rated Cameco's overall performance for the packaging and transport SCA as satisfactory.

3.14.3.2 Regulatory Focus

While no focused inspection of the packaging and transport program was conducted by CNSC staff at the RLO during the current licensing period, packaging and transport criteria were included in 2 inspections conducted during the licence term. Cameco was found to be in compliance with the inspection criteria. CNSC staff concluded that the transport and packaging program and associated procedures complied with regulatory requirements.

CNSC staff will continue to monitor performance in this area including Cameco's commitment of continual improvement for the packaging system through regulatory oversight activities. Monitoring includes inspections and desktop reviews of Cameco's compliance reporting and revisions to relevant program documentation pertaining to this SCA.

3.14.3.3 Proposed Improvements

There are no proposed improvements for this SCA.

3.14.4 Conclusion

CNSC staff concluded that Cameco has an effective program for the safe packaging and transport of radioactive materials at the RLO that meets regulatory requirements. CNSC staff rate this SCA as satisfactory.

4. Indigenous and Public Consultation and Engagement

4.1 Indigenous Consultation and Engagement

The common-law duty to consult with Indigenous peoples 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 *Nuclear Safety and Control Act* uphold the honour of the Crown and consider Indigenous peoples' potential or established Indigenous and/or treaty rights pursuant to section 35 of the *Constitution Act, 1982*.

CNSC staff are committed to building long-term relationships with Indigenous Nations and communities who have interest in CNSC-regulated facilities within their traditional and/or treaty territories. The CNSC's Indigenous engagement practices include but are not limited to sharing of information, discussing topics of interest, community tours, seeking feedback and input from leadership on CNSC regulatory processes, and providing opportunities to participate in environmental monitoring in the region. 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.

4.1.1 Discussion

CNSC staff have identified the Indigenous Nations, communities and organizations who may have an interest in the proposed licence renewal of Cameco's RLO. These groups include:

- Black Lake Denesuliné First Nation
- English River First Nation
- Fond-du-Lac Denesuliné First Nation
- Hatchet Lake Denesuliné First Nation
- Lac La Ronge Indian Band
- Métis Nation Saskatchewan (Northern Region 1)
- Prince Albert Grand Council
- Ya'thi Néné Land and Resource Office (YNLR -representing Black Lake, Hatchet Lake, and Fond du Lac Denesuliné First Nations as well as the municipalities of Stony Rapids, Uranium City, Wollaston Lake, and Camsell Portage).

The Northern Saskatchewan Environmental Quality Committee (NSEQC), which has an interest in all uranium projects in northern Saskatchewan were also identified. These entities were identified because they all have previously expressed interest in being kept informed of CNSC-licensed uranium mine and mill sites in their treaty lands and/or asserted traditional territories.

CNSC staff have been engaging with all of the identified Indigenous Nations, communities and organizations concerning the RLO on an ongoing basis since the 2013licence renewal for the RLO site. CNSC staff received Cameco's April 2021 application for a licence renewal for the RLO. CNSC staff began communication and engagement activities, including in-person meetings with the identified Indigenous Nations and communities in May 2021 with regards to Cameco's indefinite licence application.

On September 15, 2022, CNSC staff hosted Indigenous Nations and communities at a hybrid engagement session in Saskatoon on the *Regulatory Oversight Report for Uranium Mines and Mills in Canada: 2021* and to provide an update on the status and performance of the operating uranium mines and mills, including the RLO, and other topics of interest to the Indigenous Nations and communities in northern Saskatchewan. CNSC staff presented information and answered questions on upcoming hearings taking place in 2023, including Cameco's RLO licence renewal, requests for longer licensing periods, as well as various other topics. As part of this engagement session, CNSC staff heard from a number of representatives from Indigenous Nations and communities that they had serious concerns with regards to Cameco's request that the licence for the RLO be renewed for an indefinite term. CNSC staff shared their position and approach to consultation and engagement on these upcoming licence applications and that CNSC staff would not be supporting an indefinite licence term that was being proposed. At the meeting, CNSC staff were asked to share their position on the *United Nations Declaration of the Rights of Indigenous Peoples*, specifically the interpretation of free, prior and informed consent, in regards to longer licence terms and its interplay with CNSC's work. CNSC staff committed to following up with each of the Indigenous Nations and communities in attendance on this which led to a written letter and response on the CNSC's position. CNSC staff also offered to set-up additional meetings and discussions with Indigenous leadership to further discuss their concerns and ensure that this information is shared with proponents and submitted to the Commission to help inform the decision-making process.

CNSC staff sent letters of notification on September 26, 2022 to all of the Indigenous Nations, communities and organizations identified above, providing information regarding the proposed licence renewal application, the availability of participant funding to facilitate participation in the hearing process, and details on how to participate in the Commission's public hearing process proposed for June 2023.

CNSC staff followed up with the identified Indigenous Nations, communities and organizations to ensure they had received the letters and to answer any questions about the regulatory process and how to get involved in the Commission proceedings. Additional communication and updates on the regulatory process in relation to the RLO licence renewal application were provided throughout the fall and winter of 2022. This is in addition to the ongoing dialogue between CNSC staff and Indigenous Nations, communities, and organizations on a number of topics of interest on an ongoing basis.

All identified Indigenous Nations, communities and organizations were encouraged to participate in the Commission's hearing process in order to advise the Commission directly of any concerns they may have in relation to this decision-making matter. In October of 2022, CNSC staff met in person with English River First Nation in Saskatoon and with the Hatchet Lake Denesuliné First Nation leadership in Hatchet Lake where concerns regarding the length of licensing terms were again raised with respect to the RLO licence renewal application. In addition, as discussed in greater detail in section 4.2.1, CNSC staff participated in a community tour along with Cameco which included visits to 8 Indigenous Nations and communities across northern Saskatchewan. During these community tours, CNSC staff listened to feedback, concerns and perspectives from leadership and community members regarding the licence renewal applications and answered questions related to the CNSC's regulatory oversight of the RLO, their performance and CNSC staff's assessment of the licence renewal applications.

Throughout these consultation and engagement activities, CNSC staff have consistently heard from representatives of Indigenous Nations and communities that there are concerns with Cameco potentially receiving licence terms longer than 10 years from the CNSC. This is due to Indigenous Nations and communities understanding that Commission hearings are an important mechanism to share their perspectives with the decision makers and thereby influence decisions on these sites which are in their treaty and traditional territories, and that the number of such opportunities and meaningful interactions with the Commission could be reduced with a longer licence term.

Indigenous Nations and communities expressed to CNSC staff that in general they support the presence of Cameco's operations in their territories, and few direct concerns were raised regarding the performance of the RLO, but Indigenous Nations and communities indicated that they did not feel that there was enough trust between themselves and Cameco, and themselves and the CNSC, to create the right conditions for significantly longer licence terms at this time.

CNSC staff take these concerns seriously, and as part of our engagement efforts, these concerns helped to inform the CNSC's recommendation for a 15-year licence renewal term. It also helped inform the requirements for a mid-term update to the Commission with interventions from the public and Indigenous Nations and communities, as opposed to an indefinite licensing term as Cameco originally proposed. CNSC staff also offered to continue to develop long-term relationship arrangements with interested Nations and communities. In 2022 CNSC staff and the Ya'thi Néné Land and Resource Office signed a Terms of Reference for long-term engagement which commits the CNSC to engage and collaborate on a regular and ongoing basis throughout the lifecycle of the RLO and other CNSC regulated facilities of interest.

Regarding concerns over the reduced number of Commission proceedings that could come with longer licensing terms, CNSC staff have proposed the requirement for Cameco to prepare and submit an engagement report as part of the mid-term update to the Commission at the 8-year mark, as described in section 5.5. CNSC staff are committed to meeting and continuing to listen to community concerns and address them where possible, and to continuing to provide information pertaining to the RLO licence renewal.

In addition to CNSC staff's direct engagement and efforts to hear concerns and look to reach consensus on issues raised, CNSC staff encouraged all Indigenous Nations and communities with an interest in the RLO licence renewal to intervene in the Commission hearing, so that they can share their views with the Commission directly. The uranium mines and mills ROR is also an annual opportunity for Indigenous Nations and communities to get engaged and have their concerns and views heard by the Commission.

CNSC's 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 be used by CNSC staff in meeting its consultation obligations. Cameco's application for a CNSC licence renewal of the RLO does not raise the formal requirements of REGDOC-3.2.2. However, CNSC staff recognize that Cameco has a well-established engagement and communications program 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, communities and organizations. CNSC staff encourage Cameco to continue engaging with the identified Indigenous Nations, communities and organizations regarding their facilities and activities including the RLO licence renewal application. As part of Cameco's engagement efforts, Cameco demonstrated that it takes the concerns and recommendations of the identified Indigenous Nations and communities seriously. As a result of feedback and concerns heard through Cameco's consultation and engagement efforts for the RLO licence renewal request, Cameco amended their initial indefinite licence renewal request from an indefinite term to a 20-year term.

To demonstrate engagement efforts conducted as part of the proposed licence renewal, Cameco agreed to use the guidance in REGDOC-3.2.2 to prepare an engagement report for CNSC staff. The engagement report will be included in Cameco's commission member document (CMD) submission. To date, CNSC staff are satisfied with the level and quality of engagement by Cameco in relation to the RLO licence renewal request.

4.1.2 Conclusion

As Cameco's licence renewal application does not propose any changes to the facility or its operations at the RLO, CNSC staff concluded that a licence renewal for the RLO will not likely cause new adverse impacts to any potential or established Indigenous and/or treaty rights. The identified Indigenous Nations and communities have been meaningfully consulted and engaged by both CNSC staff and Cameco with regards to the licence renewal application. Their concerns have been clearly heard, documented, and measures have been proposed to address them including a 15-year licence renewal term with a mid-term update to the Commission with interventions and funding opportunities. There will also be annual opportunities to engage with the Commission through the uranium mines and mills RORs, as well as opportunities to continue developing and formalizing long-term relationships with the aim of building trust and collaboration with interested Indigenous Nations and communities, including monitoring and oversight activities as appropriate.

In addition, the identified Nations and communities have been encouraged to apply for participant funding, engage their community members and leadership and participate in the Commission hearing, to advise the Commission directly of any concerns they may have in relation to the licence renewal application. CNSC staff are committed to ongoing engagement and working with each Nation and community to address any ongoing concerns with regards to the licence renewal application for the RLO and activities as appropriate.

4.2 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 fulfill this mandate in a variety of ways, including hosting in-person and virtual information sessions and through annual regulatory reports.

Public consultation and engagement activities were conducted by Cameco and CNSC staff in support of the licence renewals. However, because of travel restrictions resulting from the COVID-19 pandemic, outreach in 2020 and 2021 was conducted virtually. With health and safety measures implemented and restrictions reduced, in-person meetings, community tours and site tours of the RLO resumed in 2022.

4.2.1 Discussion

As per its normal public notification process for Commission proceedings, CNSC staff informed the public via the CNSC's website, email subscription list, social media channels of the public Commission hearing and availability of participant funding. CNSC staff additionally informed Indigenous Nations and communities directly verbally, via email, and by phone.

The availability and clarity of information pertaining to nuclear activities is essential to establishing an atmosphere of openness, transparency and trust between the licensee and the public. Licensees have an important role to inform the public about its nuclear facility and activities. Since 2012, the CNSC requires major licensees to develop and implement a public information and disclosure program (PIDP) supported by a robust disclosure protocol that addresses local communities and stakeholders' needs, discussed fully in section 4.2.

CNSC staff annually report to the Commission and the public on the regulatory oversight of all the uranium mines and mills in northern Saskatchewan, including the RLO. The ROR's for uranium mines and mills are provided on the CNSC's website. The public has the opportunity to review, question and comment on the ROR and appear before the Commission. Through CNSC's Participant Funding Program (PFP), financial support was made available for participation in the review of this CMD.

As noted in section 4.1, engagement with Indigenous Nations, communities and organizations is an ongoing process. CNSC staff engage with interested communities and their leadership. CNSC staff participated in various meetings and local community events to offer 2-way discussion, clarity and explanation of the regulatory process and scientific data to key audiences interested in the uranium mines and mills in northern Saskatchewan (figure 4.1 to figure 4.3). For example, CNSC and licensee staff continued to participate in NSEQC meetings and facility tours in 2022. The NSEQC represents over 30 communities throughout the greater northern Saskatchewan region. Established in 1995, the NSEQC enables Northerners to learn more about uranium mining activities and to see first-hand the environmental protection measures being employed. Scheduled meetings of the NSEQC occurred throughout the licence period. CNSC staff also participate in NSEQC meetings when requested.

Figure 4.1: CNSC session with Environmental Quality Committee members

Source: CNSC

In 2019, as a result of recommendations from the Commission, CNSC staff took an initiative to meet with Indigenous Nations, communities and organizations to provide information and seek opportunity for improvement on the ROR (figure 4.2). In 2020 and 2021 these outreach sessions took place virtually due to travel and gathering restrictions imposed by the COVID-19 pandemic. On September 15, 2022, an in-person session resumed with staff providing information related to the ROR, and other items, including the proposed licence renewal for the RLO. These information sessions are conducted prior to the ROR being presented at the Commission meetings in order to get early input and feedback. Approximately 50 individuals from 8 Indigenous Nations and communities travelled to Saskatoon to participate in the CNSC's annual outreach activity.

Figure 4.2: CNSC staff hybrid outreach, Saskatoon, Saskatchewan, September 2022

Source: CNSC

During public engagement activities, the CNSC often staffs an information booth to provide important information on its regulatory role and mandate, as well as to answer any questions that community members may have. The CNSC is committed to keeping interested communities informed of regulatory activities occurring at the mines and mills and will continue to look for ways to enhance the involvement of interested Indigenous Nations and communities in northern Saskatchewan.

Figure 4.3: CNSC information session, northern Saskatchewan community, 2022

Source: CNSC

With the easing of COVID-19 travel restrictions, Cameco conducted site tours with Indigenous Nations and communities CNSC staff participated in the tour of the RLO on August 31, 2022.

A number of CNSC staff also participated in a series of community outreach events and meetings with Indigenous Nation leadership in November 2022 which were coordinated by Cameco. The tour included presentations by both CNSC and Cameco staff regarding the proposed licence renewals, followed by opportunities for questions and discussion. Two separate tours were conducted between November 21 to 23, 2022. The first tour included communities in closer proximity to the McArthur River Operation and Key Lake Operation and included meetings in Pinehouse, Patuanak and La Ronge. The second tour conducted as part of the Rabbit Lake licence renewal was focused on Athabasca communities and included meetings in Black Lake, Hatchet Lake and Fond du Lac Denesųłiné First Nations, Uranium City and Stony Rapids. While geographic proximity can be a driver of community interest, CNSC and Cameco presentations included information on all 3 operations. At these meetings, CNSC staff provided information and answered questions on the proposed licence renewals, CNSC staff's evaluations of Cameco's performance, and on the CNSC's capacity to regulate potentially longer licence terms.

4.2.2 Conclusion

CNSC staff continued to inform the public of regulatory activities through regular website updates, local magazine updates, publicly webcast Commission proceedings, social media and regular face-to-face discussion with key audiences in northern Saskatchewan.

CNSC staff encourage the public to participate in the Commission's public hearing. The CNSC offered assistance to interested members of the public, Indigenous groups, and other stakeholders, through the PFP, to prepare for and participate in the Commission's public hearing.

4.3 Licensee Public Information and Engagement

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 CNSC's 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 course of 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 and activities, and the risks to public health and safety and the environment perceived to be associated with the facility and activities.

4.3.1 Discussion

Cameco's RLO is required under its licence to maintain a PIDP as per CNSC's REGDOC-3.2.1.

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

- identifies clear goals and objectives in terms of dissemination of information to the Athabasca Basin Communities, the Northern Administrative District and the province of Saskatchewan
- is available to the public and is posted on the licensee's website
- provides information on the facilities requiring a CNSC licence for nuclear related activities.

Cameco provides this information in a variety of ways including:

- community information sessions, facility tours, technical briefings, social media, and its website
- targeting multiple audiences including the impacted communities as well as the broader regions
- providing contact information for those who want to obtain additional information.

All licensees have faced many challenges due to the COVID-19 pandemic and had to adapt their public information programs accordingly. This included moving away from traditional in-person meetings and events and offering increased digital communications whenever possible. Cameco completed this for the RLO during the COVID-19 pandemic, and in 2022 resumed in-person meetings, tours, etc.

4.3.2 Improvements to PIDP during the Current Licence Period

Cameco continues to conduct public opinion surveys, to help gain insight into specific community interests based on the geographical distribution of the population of northern Saskatchewan. The data collected serves as a baseline to identify topical areas of interest among the distributed population and to support incorporating modern communication practices. Communication products are created and distributed to local areas with the information of interest to the audience, helping solidify Cameco's relationships and openness among their multiple key audiences.

Social media has evolved significantly during the current licence period and Cameco has increased its online presence. As identified by its target audience polling, using a variety of social media platforms is beneficial to communicate directly to some primary audiences. Cameco uses these online tools to share information and monitor their public environment.

4.3.3 Conclusion

CNSC staff concluded that Cameco's PIDP for the RLO meets the regulatory requirements for public information and disclosure. CNSC staff continue to oversee Cameco's implementation of the PIDPs to ensure that it meets obligations regarding disseminating and notifying its target audiences of operational changes, and impacts on health, safety and the environment specific to its licensed activities. CNSC staff also encourage Cameco to refine and update its PIDPs on a regular basis to meet the changing information needs of its target audiences.

4.4 Participant Funding Program

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

The PFP application deadline was November 18, 2022. The Funding Review Committee, independent from 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 awarded a total of $117,236 in funding. Funding was provided to the following entities:

- Birch Narrows Dene Nation
- Canadian Environmental Law Association
- English River First Nation
- Kineepik Métis Local #9
- Métis Nation-Saskatchewan
- Ya'thi Néné Land and Resource Office

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

Cameco is in good standing with respect to CRFR requirements for the RLO.

Cameco's licence renewal application is not an initial application, and as such, the applicant is not required to submit the initial fee of C$25,000 as described in paragraph 7(1)(a), which is only for initial applicants. In this case, Cameco is subject to subsection 5(2) of the CRFR, which relates to quarterly invoices sent to licensees.

5.1.2 Conclusion

After assessing CNSC records, CNSC staff concluded that Cameco is in good standing with respect to the RLO meeting CRFR requirements.

No licence condition is required for this matter.

5.2 Financial Guarantees

Under subsection 24(5) of the NSCA, the Commission has the power to require that the licensee provide a financial guarantee in a form that is acceptable to the Commission. *General Nuclear Safety and Control Regulations*, 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 CNSC's REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

5.2.1 Discussion

Cameco maintains a financial guarantee for the decommissioning of the RLO. The current financial guarantee is C$213.4 million. This financial guarantee meets the requirements of both the CNSC and Saskatchewan Ministry of Environment (SMOE). A summary of the RLO decommissioning plan is provided on Cameco's website. As discussed in subsection 3.11.2, Cameco submitted updated PDP and cost estimate documentation for the decommissioning of the RLO. These submissions are currently undergoing CNSC staff review. Once this review is complete and Cameco has addressed all CNSC staff's comments, a CMD will be prepared for the Commission's consideration of any proposed changes to the financial guarantee for the facility.

The Government of Saskatchewan, under *The Mineral Industry Environmental Protection Regulations, 1996*, also requires that mining and milling projects be covered by financial guarantees. The provincial review of Cameco's PDP and cost estimate is independent to CNSC staff's review. The Memorandum of Understanding between CNSC and the Province of Saskatchewan allows a single PDP and financial assurance, subject to consultation and mutual acceptance [20]. The Memorandum of Understanding also specifies that the financial guarantee is conditional until approved by the Commission. The SMOE is the beneficiary of the financial guarantee for all the operating and decommissioned uranium mine and mill sites as they are located on provincial crown land.

5.2.2 Conclusion

The RLO currently has a valid financial guarantee that was approved by the Commission on March 9, 2021.

5.3 Improvement Plan and Significant Future Activities

5.3.1 Discussion

In addition to the activities during the current licence term for the RLO, Cameco identified actions which may be undertaken during the next licence term with the Mining Facility Licensing Manual [7]. For the RLO these actions include the following:

- examining options to improve methods of water management and treatment
- progressively decommissioning and reclaiming inactive facilities and areas of the property not required in current or future operating scenarios

When sufficient information has been gathered and plans developed, including any additional information necessary to support the licensed activity within those areas, Cameco would provide notification, including supporting information to CNSC staff. Note that although a return to production for either the mine or the mill at the RLO has not been identified by Cameco, CNSC staff interpret Cameco's request for a renewed operating licence as indication that Cameco may still choose to restart production at some point in the future. CNSC staff remain prepared to safely regulate this scenario, and in light of the RLO's extended care and maintenance period, are proposing to require the submission of commissioning reports prior to any operations restart, as described in the LCH.

5.3.2 Conclusion

CNSC staff will continue to conduct regulatory oversight of these activities during inspections as part of compliance verification. CNSC staff will report to the Commission on these improvements through annual RORs. For any future significant activities and improvement plans, CNSC staff will review the information submitted by Cameco to determine if the proposed activity meets the licensing basis. Any proposed changes not within the licensing basis will be brought to the Commission for consideration.

5.4 Nuclear Liability Insurance

Pursuant to section 7 of the *Nuclear Liability and Compensation Act* (NLCA), which came into force on January 1, 2017, and previously under the *Nuclear Liability Act*, the licensee for designated nuclear installations is required to maintain nuclear liability insurance.

The RLO is not designated as a nuclear installation under the NLCA because Cameco only processes natural uranium ore which is excluded from the definition of nuclear material under the NLCA. As a result, Cameco's RLO does not meet the criteria to be designated as a nuclear installation and so is not under the purview of the NLCA. Cameco maintains industrial insurance as a commercial necessity.

5.5 Proposed Licence Period

Cameco submitted an application [3] with a request to renew its CNSC-issued operating licence for the RLO for an indefinite operational period. Cameco subsequently revised their original application and on November 4, 2022, asked that the licence be renewed by the CNSC for a 20-year term [4]. Cameco noted that this application was made following engagement with Indigenous Nations and communities conducted in support of the licence renewal.

5.5.1 Discussion

In the early 2000's the typical licence period for uranium mines and mills was approximately 2 years. In 2002, following the coming into force of the NSCA and the evolution of CNSC's licensing process and regulatory framework, CNSC staff reviewed the feasibility of granting longer licence terms. As an outcome of this review, CNSC staff developed an approach to recommending an appropriate licence period, which was based on benchmarking with international practices. This approach is outlined in CMD 02-M12 and was presented to the Commission in March 2002 [21]. CMD 02-M12 provides a risk-informed process that has been used previously by CNSC staff to support recommendations regarding licence periods to the Commission. Since 2002, CNSC's regulatory framework has continued to evolve and the typical licence period for uranium mines and mills has gradually lengthened to a 10-year term. The current licence period for the RLO is 10 years. Cameco's Cigar Lake Operation, which is the most recent uranium mine or mill renewal, was granted a 10 year licence in June 2021.

More recently, CNSC has received applications from licensees requesting renewal of licences with terms in excess of 10 years. Following a review of those applications and consideration of the existing CNSC regulatory framework, CNSC staff recommended the Commission grant a 15-year licence to SRB Technologies Canada Inc (SRBT) (CMD 22-H8) and a 20-year licence be granted for the Point Lepreau Generating Station (CMD 22-H2.B). In June 2022, the Commission issued its decision on these 2 licence renewal applications. A 12-year licence was granted for SRBT, and a 10-year licence was granted for the Point Lepreau Nuclear Generating Station. While these licence terms are shorter than requested by the respective applications, they are longer than the term on the existing licences for both licensees and both decisions identified a midterm update.

CNSC staff reviewed Cameco's licence term request against the criteria from CMD 02-M12 [21] and conclude that a longer licence period for the RLO is reasonable based on those criteria and are confident that regulatory effectiveness can be maintained over periods greater than 10 years. The licensee has requested a 20-year licence term but CNSC staff's assessment has determined that a 15-year licence term is more appropriate as the site has been in a state of care and maintenance for an extended period of time (since 2016) with no indication by the licensee that this will change in the foreseeable future. In addition, since the RLO is an older facility, a return to production would require commissioning reports and assessments by Cameco to clearly demonstrate it has ensured safety through

the transition back to operations. This review is summarized in table 5.1. In addition to the criteria listed in table 5.1, CNSC staff incorporated other considerations before arriving at a recommendation on the proposed licence period. These include considerations of the international approach to fuel cycle facility licensing, CNSC's regulatory oversight framework, ongoing communication and engagement during the licence term, and ongoing Commission engagement opportunities. These considerations are discussed in the subsections below.

Table 5.1: CNSC staff assessment of the proposed 15-year licence term against CMD 02-M12 criteria

CMD 02-M12 Licence Period Criteria	CNSC Staff Position for 15-year Licence
The recommended duration of the licence should be commensurate with the licensed activity.	The RLO mine and mill uranium ore for the production of U_3O_8 (yellowcake). Other than natural uranium, other nuclear substances are present only in very limited quantities. The RLO has been in operation since 1975. Cameco has not requested any changes to the specific activities authorized by the licence (see section IV of the current and proposed licence in Part 2 of this CMD). Although new regulatory requirements have been added (regulatory documents), the principal authorized activities have not changed for the facility over several iterations of the licence. There is no specific limitation on the licence term on the basis of the licensed activity or facility life stage.
A longer licence period can be recommended when the hazards associated with the licensed activity are well characterized and their impacts well predicted, and they are within the scope considered in the environmental safety case.	Cameco has successfully characterized and mitigated hazards associated with the RLO. Cameco has implemented controls that ensure adequate measures are in place to protect the health and safety of persons and the environment. Key documents describing the safety case include Fire Hazard Assessments, Hazard and Operability Assessments, Environmental Risk Assessments (ERA) and Environmental Performance Reports. The ERA is part of the licensing basis and Cameco is required to review it at a minimum 5-year frequency, or more frequently if there are any significant changes to the facility, to ensure environmental protection measures remain current and appropriate and that predictions made in the environmental assessments remain valid. CNSC staff have prepared an Environmental Protection Review Report for the RLO. The report provides an assessment of Cameco's environmental protection measures for the purpose of confirming whether Cameco is providing adequate protection for the environment and health of persons. Rather than solely completing these reports as part

CMD 02-M12 Licence Period Criteria	CNSC Staff Position for 15-year Licence
	of a licensing decision/action, CNSC staff will now issue these reports on a 5-year basis, and these will be posted on CNSC's website for public viewing. These reports will be used to document CNSC staff's determination of whether Cameco's environmental protection measures provide adequate protection for the environment and health of persons, independent of the licence term. Regardless of the licence term, CNSC staff will continue to verify and ensure that, through ongoing licensing and compliance activities and reviews, Cameco provides adequate protection of the environment and the health and safety of persons.
A longer licence period can be recommended when licensees have in place a management system, such as a quality assurance program, to provide assurance that their safety-related activities are effective and maintained.	As noted in section 3.1, Cameco has a management system that meets the requirements of CSA N286-12 at the RLO. CNSC staff have inspected Cameco's management system at the RLO and found they meet the requirements of CSA N286-12. The requirements in N286-12 in the areas of Self-Assessment, Independent Assessment, Continual Improvement, Problem Identification and Resolution, Design and Change Control, and Maintenance (to name a few) provides a framework to ensure that all work activities are planned and carried out effectively. Cameco has demonstrated its ability to update its management systems over time, in response to operational experience and changing regulatory requirements. Cameco's safety performance over the previous 10-year licence period provides further demonstration that effective programs are maintained to ensure safety while performing licensing activities.
A longer licence period can be recommended when effective compliance programs are in place on the part of both the applicant/licensee and the CNSC.	Cameco has established programs describing the implementation of control measures to ensure that the RLO remains in compliance within their licensing basis. CNSC staff have reviewed the program to confirm regulatory expectations are being met. In accordance with the change notification process defined in the LCH, CNSC staff are required to be notified of revisions to licensing basis documents, which triggers CNSC staff review of those revised documents to ensure compliance with the licensing basis is not adversely impacted. During the previous licence period, CNSC staff formalized expectations and added additional requirements through publication of new/revised regulatory documents and adoption of the new standards. In each case, Cameco has reviewed and revised its programs where necessary to implement these requirements.

CMD 02-M12 Licence Period Criteria	CNSC Staff Position for 15-year Licence
	The CNSC has a robust and effective compliance verification program to ensure there is adequate regulatory oversight over the licensed activities at the RLO. CNSC staff verify compliance through desktop reviews, inspections, and event reviews. CNSC has established and implemented a compliance strategy for the RLO, which identifies a risk-informed frequency for inspections of each SCA. CNSC staff have created a rolling 10-year inspection schedule to ensure that inspections are conducted in accordance with the SCA risk ranking (table 3.1), and the risk categorization of the RLO activities. The inspection plan is reviewed on an annual basis to ensure that any changes in site operation are accounted for (facility in care and maintenance, restart of operations, etc.) In total, CNSC staff conducted 36 inspections at RLO, since the beginning of the current licence term. In addition to program documentation reviews, CNSC performs desktop reviews of quarterly and annual compliance reports submitted by Cameco in accordance with requirements specified in the LCH. CNSC staff also review event reports, which are submitted by Cameco in accordance with requirements specified in REGDOC 3.1.2. CNSC staff review these reports to verify that Cameco implements appropriate corrective actions, where necessary, to prevent recurrence and ensure that adequate provisions ensuring protection of the health and safety of persons and the environment remain in place.
A longer licence period can be recommended when the licensee has shown a consistent and good history of operating experience and compliance in carrying out the licensed activity.	CNSC staff review and assess licensee performance on an ongoing basis. During the current licence period CNSC staff rated Cameco's performance as satisfactory across all SCA's each year. These ratings and other compliance highlights have been published and reported to the Commission in public meetings, through the *Regulatory Oversight Report for Uranium Mines and Mills in Canada*. When CNSC staff have identified areas of non-compliance, these have been of low safety significance and Cameco has ensured that effective corrective actions have been taken to correct the non-compliances. As described in this CMD, Cameco has demonstrated satisfactory performance over the current licence period and has conducted operations in accordance with its licensing basis. Worker doses and doses to the public have been kept below regulatory limits at all times (section 3.7), and releases to the environment have been maintained at a small fraction of the licensed release limits (section 3.9).

CMD 02-M12 Licence Period Criteria	CNSC Staff Position for 15-year Licence
	Cameco has also demonstrated good performance in the conventional health and safety SCA (section 3.8). Cameco has adhered to events reporting and response requirements detailed in REGDOC-3.1.2. The events reported to the CNSC during the current licence period are provided in sections 3.7, 3.8 and 3.9. CNSC staff are satisfied with Cameco's reporting and response to events during the current licence period, and all actions associated with these events are considered closed.
The licence period must be consistent with the requirements of the CNSC Cost Recovery Fees Regulations.	As per section 5.1, Cameco is currently in good standing with the *CNSC Cost Recovery Fees Regulations*.
The licence period should take account of the planning cycle of the facility and the licensee's plans for any significant change in licensed activity.	At the time of writing this commission member document, Cameco conveyed its intent to continue to maintain the RLO in a safe state of care and maintenance. In its application, Cameco has not identified any specific internal project, contract, or milestone which is currently planned or ongoing that should inform a recommendation for a specific licence term length. However, Cameco noted that facility change control and design control are utilized at the operation to ensure that any physical change to the facility is reviewed and approved by the appropriate personnel prior to implementation. Prior notification is provided to CNSC staff regarding any changes to the facility or their operation that have the potential to be outside of the licensing basis. Any proposed changes determined to be outside of the licensing basis are subject to Commission approval. The estimated operational life of the RLO is different for the mine and the mill. Cameco's publicly-available data (Reserves & Resources - Rabbit Lake - Suspended - Uranium Operations - Businesses - Cameco) indicates significant reserves remaining for the mine, while the available space in the tailings management facility (TMF) is relatively limited, compared to the space available at the Key Lake Operation. While in a state of care and maintenance, mine reserves remain static, and the space used in the RLITMF is very limited. Should Cameco wish to expand the capacity of the RLITMF, additional Commission approval may be required.

International approach to fuel cycle facility licensing

Internationally, nuclear fuel cycle facilities are issued licences for periods ranging from a few years to the entire lifecycle of the facility, supported by periodic, comprehensive assessments of facility safety. On June 29, 2022, the new Subsoil Use Code came into effect in Kazakhstan. Under the code, the maximum term for a production licence which covers uranium mining, mineral processing and operational exploration is 25 years with a possible extension for the same period, which may be granted several times. The United States Nuclear Regulatory Commission also updated the policy on licence terms in 2017. The maximum licence terms for new applications and licence renewals for uranium recovery facilities was changed from 10 years to 20 years under this new policy.

In addition to the review and summarization of licensee performance undertaken as part of a licence renewal, the CNSC has a number of processes in place to achieve these objectives on a continual basis. The Canadian regulatory framework includes requirements for periodic review and update of essential documentation. Licensees are required to update environmental risk assessments, preliminary decommissioning plans and financial guarantees on a minimum 5-year frequency. Additionally, CSA N286-12, *Management System Requirements for Nuclear Facilities* [6] requires that the licensee periodically review and assess all program documentation. The CNSC staff-issued LCH requires prior notification of any changes to licensing basis programs before implementation. CNSC staff reviews the updated version to ensure continued compliance with the licensing basis. This provides assurance that the licensing basis remains valid and that programs in place are acceptable on a continual basis.

The CNSC requires that Canadian nuclear fuel cycle licensees establish and implement fitness for service (maintenance) programs for their facilities. These programs are in place to support the ongoing safety of operation by identifying maintenance needs, including monitoring, inspection, testing, assessment, calibration, service, overhaul, repairs, and replacement of parts. The programs identify the maintenance activities that are needed and CNSC staff verify compliance with the maintenance programs during planned compliance activities. It is significant to note that in cases where replacement of equipment is necessary, nuclear fuel cycle facilities are able to plan and carry out these activities on an ongoing basis, typically without the need for complicated outage scheduling that potentially impacts other operations. Systems important to safety for nuclear fuel cycle facilities are comparatively simple to maintain or replace (i.e., relative to nuclear power plants) and this work can usually be done during normal outages. With the maintenance programs and effective regulatory oversight of maintenance activities in place, CNSC staff remain satisfied that the adequacy of structures, systems and components is appropriately controlled at the RLO.

CNSC regulatory oversight

The CNSC nuclear fuel cycle regulatory program is effective, independent of the licence period granted by the Commission. CNSC staff have established a 10-year baseline compliance plan for all nuclear fuel cycle facilities. This baseline compliance plan is carried out regardless of the licence period and verifies continued safety through planned assessments and reviews. The plan establishes a minimum number of inspections to be carried out at a given facility based on the facility's risk profile and is augmented by additional inspections tailored to the specific features of the facility itself. CNSC staff review the plan annually as well as the licensee's planned activities for the year to determine if additional verification activities should be added or moved. This approach is flexible and agile to ensure that appropriate, risk-informed regulatory oversight is in place, regardless of the licence period. The baseline inspection plan establishes a minimum level of oversight for each facility, and CNSC staff can add additional compliance activities whenever there is a need.

CNSC requirements are updated through changes of regulations made under the NSCA or other relevant legislation, and updates to the suite of CNSC regulatory documents or the set CSA standards. Changes to regulation come into force automatically at the completion of the regulation making process. CNSC staff have also established a process, through the LCH, to ensure updated requirements in regulatory documents and CSA standards are implemented within the licence term. The process involves CNSC staff requesting licensee plans for implementation of the updated requirement supported by a gap analysis of the updated requirements. Once the licensee responds to the request, the commitment to implement the document is recorded and entered into the LCH at the next update. This ensures that modern codes, standards, and practices are implemented continually, rather than using a periodic assessment. The past decade has been a very active period for the development of regulatory documents and CSA N-series standards, which are applicable to the management of nuclear facilities. The process outlined above, has therefore been followed during the current licence period for the RLO. The implementation of updated requirements involves a substantial effort by the licensee, and Cameco has been accepting of implementing the requirements and guidance at all times during the current licence period. This example demonstrates the flexibility of the current regulatory framework to continually introduce, update and modernize requirements within the licence term to ensure licensed activities continue to be carried out safely.

Ongoing communication and engagement

To deliver on the CNSC mandate to disseminate objective scientific, technical and regulatory information to the public, CNSC remains committed to openness and transparency through effective communication and engagement. Licensing hearings currently represent an opportunity to engage with Indigenous Nations and communities as well as the public. However, this type of engagement was often focused on upcoming Commission proceedings.

To modernize the approach to engagement and ongoing communications, CNSC staff have implemented a number of improvements in recent years, including:

- Signing terms of reference with Indigenous Nations and communities to formalize a forum for collaboration, which creates space to address areas of interest with ongoing, respectful and open dialogue.
- Posting CNSC staff's EPR reports online, independently of the documents drafted during the licensing process, to ensure that information related to environmental protection is easily accessible to the public at any time, and well ahead of any Commission meetings or hearings.
- Updating nuclear facility web pages on the CNSC public website to provide useful and, easily accessible, information for interested parties.
- Initiating a review of the annual regulatory oversight reports presented to the Commission and associated engagement to ensure they provide useful information to Indigenous Nations and communities.
- Proposing the adoption of mid-term licensing basis review for RLO, to provide facility-specific information to Indigenous Nations and communities and the public on the current frequency, along with an associated opportunity to interact with the Commission. This is further described below.

In addition to these improvements, CNSC staff are planning reviews of REGDOC-3.2.2, *Indigenous Engagement* and REGDOC-3.2.1, *Public Information and Disclosure*, to ensure requirements related to engagement and communications are modernized and aligned with best practices. The CNSC is also evaluating the potential for representatives from Indigenous Nations and communities to observe CNSC inspections. A working group has been established within the CNSC with representatives from across the organization for this initiative.

These improvements and planned reviews demonstrate CNSC staff's commitment to the modernization of information sharing and engagement. As additional improvements are identified over time, CNSC staff will review them to determine practical steps that can be taken to adopt the improvements. CNSC staff will continue to monitor ongoing communication and engagement efforts, regardless of the licence term, to ensure that the approach is modern, agile and focused on the effectiveness of communication with interested parties.

Mid-term reporting for licence periods greater than 10 years

Historically, public and Indigenous Nations, communities and organizations in northern Saskatchewan have expressed interest in CNSC licensing activities for uranium mines and mills. Concerns were expressed to CNSC staff during engagement activities that opportunities for meaningful engagement may not be adequate within an extended licence term, due to Commission hearings becoming less frequent. CNSC staff are therefore recommending that in addition to the opportunities outlined above, if the Commission grants a licence term greater than 10 years to Cameco's RLO, Cameco shall provide a comprehensive performance update to the Commission at mid-term point of the licence period.

The update would consist of a report documenting a thorough licensing basis review, that is, a report documenting Cameco's performance across all 14 SCAs as well as the submission of revised programs as needed for CNSC staff review and acceptance.

Cameco's submission would include a report on Indigenous engagement activities in accordance with REGDOC-3.2.2, *Indigenous Engagement*, and covering the licence term to date, as well as other regulatory matters of interest, and a future outlook for the remainder of the licence period. The performance update would be made available for public review in advance of the Commission meeting. Cameco's presentation during a Commission meeting would provide an opportunity for Indigenous Nations and communities and the public to provide input and perspective to the Commission at a frequency in line with current norms. Note that in line with the principle of continuous improvement, CNSC staff expect that Cameco will update and address necessary changes to programs as they arise rather than delaying these updates to the mid-term review.

In conjunction with Cameco's mid-term licensing basis review report, CNSC staff will continue to report on Cameco's performance, CNSC activities conducted (including inspections and engagement and outreach activities), the status of licensing documentation and a future outlook via the applicable ROR. CNSC staff's recommendation that a mid-term update be put in place for the RLO is in alignment with the recent decisions of the Commission (SRBT, Point Lepreau Nuclear Generating Station and Cameco Fuel Manufacturing).

Staff-level hold points for the RLO

In addition to the proposed mid-term update, and regardless of the Commission's chosen licence term for the RLO, CNSC staff intend to place 2 staff-level hold points via specific licence conditions in the RLO LCH, due to its extended time spent in care and maintenance. This long shutdown period has led CNSC staff to determine that should Cameco decide to restart operations at the RLO, additional regulatory oversight will be required.

CNSC will require that Cameco submit commissioning reports to CNSC staff prior to any restart of mining or milling operations. These commissioning reports must clearly document how Cameco has ensured safety through the transition back to operations. These reports must demonstrate how Cameco has managed both the fitness for service of plant systems at the RLO, and how Cameco has ensured that a sufficient number of trained and qualified staff are present to ensure safety. These reports must document how Cameco has engaged with Indigenous Nations and communities regarding any restart of the operation.

Because Cameco could elect to restart only the mine or only the mill at the RLO, Cameco will be required to submit a separate report for each if they are started separately. A single report could be submitted if they resume at the same time. The report must be accepted by CNSC staff prior to the restart of operations covered by the report, and the contents of the report will be verified through CNSC compliance activities. Thus, CNSC staff will ensure that Cameco has taken all measures necessary to ensure a safe restart of operations at the RLO.

Commission engagement opportunities

CNSC staff's capability to deliver on its mandate is not impacted by the licence period. Irrespective of the period of a licence granted by the Commission, the powers of the Commission will not be impacted. The Commission has the authority to call public proceedings on any matter of interest to the Commission at any time, and to include intervenor participation and to make participant funding available in such proceedings. The Commission may, at any time, amend, suspend, revoke or replace a licence under the conditions prescribed in the GNSCR. As prescribed in paragraph 25(2) of the GNSCR, conditions under which the Commission may take such action include: if the licensee is not qualified to carry out the licensed activity; the licensee has failed to comply with the Act, the regulations made under the Act, or its licence; or the licensed activity poses an unreasonable risk to the environment.

CNSC staff activities and licensee performance for all nuclear facilities, including the RLO, are reported to the Commission through annual RORs, which are presented to the Commission during a meeting with the licensee, Indigenous and public participation. CNSC staff also engage the Commission through Event Initial Reporting, which provides notification of significant events or issues, potentially requiring Commission decision.

Any concerns identified by CNSC staff can be raised to the Commission for consideration at any time and any requested changes from Cameco that are deemed to be outside the licensing basis are subject to additional Commission approvals, regardless of the licence period.

5.5.2 Conclusion

CNSC staff concluded that the regulatory approach in place is effective, is aligned with international practices and is able to provide appropriate regulatory oversight for the RLO for any licence period chosen by the Commission. Cameco's performance at the RLO has been consistently satisfactory and adequate over the current licence period and reporting processes are in place to cover any licensing period chosen by the Commission. If the Commission approves CNSC staff's recommended 15-year licence term and associated mid-term update, the CNSC regulatory approach is agile and can adapt to address any future changes in the regulatory landscape.

5.5.3 Recommendation

It is recommended that the Commission grant a licence to Cameco's RLO for a period of 15 years. This recommended period is longer than past licences in recognizance of licensee performance and CNSC staff's regulatory capabilities but is shorter than that recommended for the McArthur River Operation and the Key Lake Operation due to the RLO's ongoing state of care and maintenance. Due to the extended care and maintenance state, CNSC staff recommend that the Commission revisit the file at a shorter frequency. If a licence term greater than 10 years is granted, CNSC staff recommend that the Commission require that Cameco provide a comprehensive performance update to the Commission at

the mid-point of the licence term. This would reassure the Commission of Cameco's continued satisfactory performance and would provide an opportunity for Indigenous Nations and communities and the public to provide input on the RLO directly to the Commission. CNSC staff would also provide an update to the Commission in the applicable ROR.

5.6 Delegation of Authority

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

There are 2 licence conditions in the proposed RLO licence, UML-MINEMILL-RABBIT.00/2038 that contains the phrase below.

- The first licence condition is reporting requirements as described below.

  3.2 Reporting Requirements

  The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

  Licence condition 3.2 is in the existing licence and the delegation for reporting has previously been authorized.

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

  - Director, Uranium Mines and Mills Division
  - Director General, Directorate of Nuclear Cycle and Facilities Regulation
  - Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch.

- The second licence condition is the submission of a commissioning report as described below.

  15.1 Commissioning Report

  The licensee shall submit a commissioning report to the Commission, or a person authorized by the Commission, in the event of a return to operations.

  Licence condition 15.1 is being included when/if the licensee decides to return to operations from their current state of care and maintenance. CNSC staff recommend that the Commission delegate its authority for the purpose of reviewing and determining the acceptability of the commissioning report.

  It is proposed that the delegation of authority be the same as that for licence condition 3.2

6. Overall Conclusions and Recommendations

CNSC staff conclusions and recommendations consider an overall assessment of Cameco's compliance with the NSCA and its regulations during the current licence period (2013 to 2022). Cameco has programs, resources, and measures in place at the RLO 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.

6.1 Overall Conclusions

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

CNSC staff have found that the potential risks from RLO radiological and hazardous releases to the atmospheric, terrestrial, aquatic and human environments are low to negligible, and that these releases are at levels similar to natural background. Furthermore, human health is not impacted by operations at the RLO, and the health outcomes are indistinguishable from health outcomes found in similar northern Saskatchewan communities. CNSC staff have also found that Cameco 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 Cameco's environmental protection programs through ongoing licensing and compliance activities.

6.2 Overall Recommendations

CNSC staff recommend the following, in regard to the Rabbit Lake Operation:

1. **Conclude**, pursuant to paragraphs 24(4)(a) and (b) of the *Nuclear Safety and Control Act* (NSCA) in that Cameco Corporation:

   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. **Issue** the proposed licence UML-MINEMILL-RABBIT.00/2038
3. Delegate authority as set out in section 5.6 of this CMD.

References

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4. Correspondence from A. Thorne (Cameco) to D. Saumure (CNSC), Licence Renewal for Cameco Corporation Key Lake, McArthur River and *Rabbit Lake Operations*, November 4, 2022.
5. Rabbit Lake *Environmental Performance Report, Final Report* 2015-2019, CanNorth Environmental Services, December 2020 (e-Doc 6451233).
6. CSA Group, CSA N286-12, *Management System Requirements for Nuclear Facilities*, June 2012.
7. Cameco Corporation Rabbit Lake Operation, *LIC-001, Mining Facility Licensing Manual*, December 2022 (e-Doc 6941575).
8. Cameco Corporation Rabbit Lake Operation, *LIC-002, Mill Operations Program*, April 2022 (e-Doc 6793534).
9. Cameco Corporation Rabbit Lake Operation, *LIC-010, Eagle Point Mine Program*, November 2022 (e-Doc 6936517).
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11. CSA Group, CSA N288.4-10, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, May 2010.
12. CSA Group, CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, April 2011.
13. CSA Group, CSA N288.6-12, *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills*, June 2012.
14. CSA Group, CSA N288.7-15, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills*, January 2015.
15. CSA Group, CSA N288.8-17, *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities*, February 2017.
16. International Standards Organization, ISO 14001:2015 standard *Environmental Management System – Requirements with Guidance for Use*, September 2015.

17. Correspondence from S. Harriman (Cameco) to G. Groskopf (CNSC), Rabbit Lake Operation, Rabbit Lake Integrated HHERA and EPR – 2010 to 2014, December 21, 2015 (e-Doc 4909430).

18. Cameco Corporation*, Rabbit Lake Operation, Licensed Activities, Fire Hazard Analysis,* by Professional Loss Control. February 5, 2013 (e-Doc 4113565).

19. CSA Group, CSA N393, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances*, January 2013.

20. Memorandum of Understanding between Saskatchewan and AECB, Atomic Energy Control Board, September 1996 (e-Doc 3816864).

21. CMD 02-M12, *New Staff Approach to Recommending Licence Periods*, March 2002 (e-Doc 3007783).

22. CSA Group, CSA N294-09, *Decommissioning of Facilities Containing Nuclear Substances,* January 2019.

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.

Additional terms and acronyms used in this CMD are listed below.

Acronym	Term
AGTMF	Above Ground Tailings Management Facility
ALARA	As Low As Reasonably Achievable
BE	Below expectations
Cameco	Cameco Corporation
CMD	Commission Member Document
CNSC	Canadian Nuclear Safety Commission
COPC	Constituents of Potential Concern
CRFR	*Cost Recovery Fees Regulations*
CSA	CSA Group (formerly Canadian Standards Association)
EMP	Environmental Management Program
EMS	Environmental Management System
EPR	Environmental Protection Reviews
ERA	Environmental Risk Assessment
ERT	Emergency Response Team
FS	Fully Satisfactory
FTE	Full-time equivalents
GNSCR	*General Nuclear Safety and Control Regulations*
IAEA	International Atomic Energy Agency
ICRP	International Commission on Radiological Protection
IEMP	Independent Environmental Monitoring Program
Kg	Kilogram
LCH	Licence Conditions Handbook
LLRD	Long-lived Radioactive Dust

LTI	Lost-time Injury
MDMER	*Metal and Diamond Mining Effluent Regulations*
MKg	Million kilograms
MRT	Mine Rescue Team
mSv	Millisievert
MWS	Mineralized Waste Stockpile
NEW	Nuclear Energy Worker
NLCA	*Nuclear Liability and Compensation Act*
NSCA	*Nuclear Safety and Control Act*
NSEQC	Northern Saskatchewan Environmental Quality Committee
PDP	Preliminary Decommissioning Plan
PFP	Participant Funding Program
PIDP	Public Information and Disclosure Program
REGDOC	Regulatory Document
RLITMF	Rabbit Lake In-pit Tailings Management Facility
RnG	Radon Gas
RnP	Radon Progeny
ROR	Regulatory Oversight Report
RP	Radiation Protection
RPR	*Radiation Protection Regulations*
SA	Satisfactory
SAT	Systematic Approach to Training
SCA	Safety and Control Area
SMOE	Saskatchewan Ministry of Environment
TMF	Tailings Management Facility
TSP	Total Suspended Particulate
UA	Unacceptable
UMMR	*Uranium Mines and Mills Regulations*
µg	microgram
µSv	microSievert

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 one 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 Reports and now has a rating of SA, does not necessarily indicate a reduction in performance.

B. Basis for the Recommendations(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:

- The *General Nuclear Safety and Control Regulations* (GNSCR) requires that an application for a licence shall contain, under paragraph:
  - 3(1)(*k*), the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the Act and the regulations made under the Act, including the internal allocation of functions, responsibilities and authority.
- It is a requirement of the *General Nuclear Safety and Control Regulations* under section 15 that every applicant for a licence and every licensee shall notify the Commission of:
  - 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.
  - 15(c), any change in the information referred to in paragraphs (a) and (b) within 15 days after the change occurs.
- It is a requirement of the *Uranium Mines and Mills Regulations* (UMMR) under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(b) of the *General Nuclear Safety and Control Regulations,* in relation to the activity to be licensed:
  - 3(b)(v), the proposed quality assurance program for the activity.

Operating Performance

The regulatory foundation for the recommendation(s) associated with operating performance includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under subsection 29(1), that every licensee who becomes aware of any of the following situations shall immediately make a preliminary report to the Commission of the location and circumstances of the situation and of any action that the licensee has taken or proposes to take with respect to it:
  - 29(1)(a), a situation referred to in paragraph 27(b) of the Act.
  - 29(1)(b), the occurrence of an event that is likely to result in the exposure of persons to radiation in excess of the applicable radiation dose limits prescribed by the *Radiation Protection Regulations*.
  - 29(1)(c) a release, not authorized by the licence, of a quantity of radioactive nuclear substance into the environment.
  - 29(1)(d), a situation or event that requires the implementation of a contingency plan in accordance with the licence.
  - 29(1)(f), information that reveals the incipient failure, abnormal degradation or weakening of any component or system at the site of the licensed activity, the failure of which could have a serious adverse effect on the environment or constitutes or is likely to constitute or contribute to a serious risk to the health and safety of persons or the maintenance of security.
  - 29(1)(h), a serious illness or injury incurred or possibly incurred as a result of the licensed activity.
  - 29(1)(i) the death of any person at a nuclear facility
- It is a requirement of the *General Nuclear Safety and Control Regulations* under subsection 29(2), that every licensee who becomes aware of a situation referred to in subsection (1) shall file a full report of the situation with the Commission within 21 days after becoming aware of it, unless some other period is specified in the licence, and the report shall contain the following information:
  - 29(2)(a), the date, time and location of becoming aware of the situation.
  - 29(2)(b), a description of the situation and the circumstances.
  - 29(2)(c), the probable cause of the situation.
  - 29(2)(d), the effects on the environment, the health and safety of persons and the maintenance of security that have resulted or may result from the situation.
  - 29(2)(e), the effective dose and equivalent dose of radiation received by any person as a result of the situation
  - 29(2)(f), the actions that the licensee has taken or proposes to take with respect to the situation.

- It is a requirement of the *Uranium Mines and Mills Regulations* under paragraphs 6(1)(a) and 6(2)(a), that an application for a licence in respect of a uranium mine and mill shall contain the results of any commissioning work.
- It is a requirement of the *Uranium Mines and Mills Regulations* under paragraphs 6(1)(c) that an application for a licence in respect of a uranium mine and mill shall contain the proposed policies, methods and programs for operating and maintaining the mine.
- It is a requirement of the *Uranium Mines and Mills Regulations* under subsection 10(a), that every licensee shall establish, implement and maintain written operating procedures for the licensed activity.

Safety Analysis

The regulatory foundation for the recommendation(s) associated with safety analysis includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under paragraph 3(1)(i) 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 *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(c) of the *General Nuclear Safety and Control Regulations*, in relation to the environment and waste management, and (d) health and safety:
  - 3(c)(iii), effects on the environment that may result from the activity to be licensed and the measures that will be taken to prevent or mitigate those effects.
  - 3(d)(i) the effects on the health and safety of persons that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects.

Physical Design

The regulatory foundation for the recommendation(s) associated with physical design includes the following:

- 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.
- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(a) of the *General Nuclear Safety and Control Regulations,* in relation to the plan and description of the mine or mill:
  - 3(a)(ii), a surface plan indicating the boundaries of the mine or mill and the area where the activity to be licensed is proposed to be carried on.
  - 3(a)(iii), a plan showing existing and planned structures, excavations and underground development.
  - 3(a)(iv) a description of the mine or mill, including the installations, its purpose and capacity, and any excavations and underground development.
- It is a requirement of the *Uranium Mines and Mills Regulations* under subsection 5(2), that an application for a licence to prepare a site for and construct a uranium mill shall contain the following information in addition to the information required by section 3 and subsection 4(2):
  - 5(2)(h), a description of all proposed laboratory facilities and programs.
- It is a requirement of the *Uranium Mines and Mills Regulations* under paragraphs 6(1)(b) and 6(2)(b), that an application for a licence to operate a uranium mine and mill shall contain a description of the structures, components, systems and equipment including any changes to its design and its design operating conditions as a result of the commissioning.
- It is a requirement of the *Uranium Mines and Mills Regulations* under paragraphs 16(1)(e) that every licensee shall keep a record of the design of the uranium mine or mill and of the components and systems installed at the mine or mill.

Radiation Protection

The regulatory foundation for the recommendation(s) associated with radiation protection includes the following:

- The *General Nuclear Safety and Control Regulations* require, under subsection 3(1), that a licence application contain the following information under paragraphs:
  - 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 *General Nuclear Safety and Control Regulations* require, under subsection 17(b), that a worker comply with the measures established by the licensee to protect the environment and the health and safety of persons, maintain security, control the levels and doses of radiation, and control releases of radioactive nuclear substances and hazardous substances into the environment.
- It is a requirement for uranium mines and mills licensee to follow the *Radiation Protection Regulations*.
- It is a requirement of the *Uranium Mines and Mills Regulations* under subsection 4(2), that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain a proposed code of practice that includes:
  - 4(2)(a), any action level that the applicant considers appropriate for the purpose of this subsection.
  - 4(2)(b), a description of any action that the applicant will take if an action level is reached.
  - 4(2)(c), the reporting procedures that will be followed if an action level is reached.
- It is a requirement of the *Uranium Mines and Mills Regulations* under section 9, that every licensee shall post a copy of the code of practice referred to in the licence at a location within the uranium mine or mill that is accessible to all workers and where it is most likely to come to their attention.
- It is a requirement of the *Uranium Mines and Mills Regulations* under section 13, that no licensee shall rely on the use of a respirator to comply with the *Radiation Protection Regulations* unless the use of the respirator:
  - 13(a), is for a temporary or unforeseen situation.
  - 13(b), is permitted by the code of practice referred to in the licence.

- It is a requirement of the *Uranium Mines and Mills Regulations* under section 14, that every licensee shall:
  - 14(a), post signs at all entrances to each area where the dose rate of gamma radiation exceeds 25 µSv/h, designating the area as a radiation area and indicating the dose rate of gamma radiation in that area.
  - 14(b), provide every worker who is to enter an area where the dose rate of gamma radiation exceeds 100 µSv/h with a direct-reading dosimeter.
- It is a requirement of the *Uranium Mines and Mills Regulations* under subsection 16(1), that every licensee shall keep a record of:
  - 16(1)(f), the method and relevant data used to ascertain the doses of radiation received by the workers at the uranium mine or mill and the intake of radioactive nuclear substances by those workers.

Conventional Health and Safety

The regulatory foundation for the recommendation(s) associated with conventional health and safety includes the following:

- The *General Nuclear Safety and Control Regulations* require, under paragraph 12(1)(c), 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.
- The *General Nuclear Safety and Control Regulations* require, under subsection 16(1), that every licensee shall make available to all workers the health and safety information with respect to their workplace that has been collected by the licensee in accordance with the Act, the regulations made under the Act and the licence.
- It is a requirement of the *General Nuclear Safety and Control Regulations* under section 17, that every worker shall:
  - 17(a), use equipment, devices, facilities and clothing for protecting the environment or the health and safety of persons, or for determining doses of radiation, dose rates or concentrations of radioactive nuclear substances, in a responsible and reasonable manner and in accordance with the Act, the regulations made under the Act and the licence.
  - 17(b), comply with the measures established by the licensee to protect the environment and the health and safety of persons, maintain security, control the levels and doses of radiation, and control releases of radioactive nuclear substances and hazardous substances into the environment.
  - 17(c)(i), promptly inform the licensee or the worker's supervisor of any situation in which the worker believes there may be a significant increase in the risk to the environment or the health and safety of persons.

- 17(e), take all reasonable precautions to ensure the worker's own safety, the safety of the other persons at the site of the licensed activity, the protection of the environment, the protection of the public and the maintenance of the security of nuclear facilities and of nuclear substances.

- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(d) of the *General Nuclear Safety and Control Regulations*, in relation to health and safety:
  - 3(d)(i), the effects on the health and safety of persons that may result from the activity to be licensed, and the measures that will be taken to prevent or mitigate those effects.
  - 3(d)(ii), the proposed program for selecting, using and maintaining personal protective equipment.
  - 3(d)(iii), the proposed worker health and safety policies and programs.

Environmental Protection

The regulatory foundation for the recommendation(s) associated with environmental protection includes the following:

- 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 dose limits for the general public, which under subsection 1(3) is 1 mSv per calendar year.
- It is a requirement of the *General Nuclear Safety and Control Regulations* under section 17, that every worker shall:
  - 17(a), use equipment, devices, facilities and clothing for protecting the environment or the health and safety of persons, or for determining doses of radiation, dose rates or concentrations of radioactive nuclear substances, in a responsible and reasonable manner and in accordance with the Act, the regulations made under the Act and the licence.
  - 17(b), comply with the measures established by the licensee to protect the environment and the health and safety of persons, maintain security, control the levels and doses of radiation, and control releases of radioactive nuclear substances and hazardous substances into the environment.
  - 17(c)(i), promptly inform the licensee or the worker's supervisor of any situation in which the worker believes there may be a significant increase in the risk to the environment or the health and safety of persons.

- 17(e), take all reasonable precautions to ensure the worker's own safety, the safety of the other persons at the site of the licensed activity, the protection of the environment, the protection of the public and the maintenance of the security of nuclear facilities and of nuclear substances.

- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(c) of the *General Nuclear Safety and Control Regulations*, in relation to the environment and waste management:
  - 3(c)(ii), the program to determine the environmental baseline characteristics of the site and the surrounding area.
  - 3(c)(iii), effects on the environment that may result from the activity to be licensed and the measures that will be taken to prevent or mitigate those effects.
  - 3(c)(iv), the proposed positions for and qualifications and responsibilities of environmental protection workers.
  - 3(c)(v), the proposed environmental protection policies and programs.
  - 3(c)(vi), the proposed effluent and environmental monitoring programs.
  - 3(c)(vii), the proposed location, 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 its physical, chemical and radiological characteristics.
  - 3(c)(viii), the proposed measures to control releases of nuclear substances and hazardous substances into the environment.

    3(c)(ix), a description of the anticipated liquid and solid waste streams within the mine or mill, including the ingress of fresh water and any diversion or control of the flow of uncontaminated surface and ground water.

- It is a requirement of the *Uranium Mines and Mills Regulations* under subsection 4(2), that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain a proposed code of practice that includes:
  - 4(2)(a), any action level that the applicant considers appropriate for the purpose of this subsection.
  - 4(2)(b), a description of any action that the applicant will take if an action level is reached.
  - 4(2)(c), the reporting procedures that will be followed if an action level is reached.

- It is a requirement of the *Uranium Mines and Mills Regulations* under section 9, that every licensee shall post a copy of the code of practice referred to in the licence at a location within the uranium mine or mill that is accessible to all workers and where it is most likely to come to their attention.
- The Rabbit Lake Operation licence requires Cameco to control, monitor and record releases of effluent concentrations from the facility and that the releases shall not exceed the limits found in the licence.

Emergency Management and Fire Protection

The regulatory foundation for the recommendation(s) associated with emergency management and response includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under subsection 12(1) that every licensee shall:
  - 12(1)(c), take all reasonable precautions to protect the environment and the health and safety of persons and to maintain security of nuclear facilities and of nuclear substances.
  - 12(1)(f), 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 *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(a) of the *General Nuclear Safety and Control Regulations,* in relation to the plan and description of the mine or mill:
  - 3(a)(ix), a description of the proposed emergency power systems and its capacities.
- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by subsection 3(c) of the *General Nuclear Safety and Control Regulations*, in relation to the environment and waste management:
  - 3(c)(viii), the proposed measures to control releases of nuclear substances and hazardous substances into the environment.
  - 3(c)(x), the 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 security, including measures to:
    - 3(c)(x)(A), assist off-site authorities in planning and preparing to limit the adverse effects of an accidental release.
    - 3(c)(x)(B), notify off-site authorities of an accidental release or the imminence of an accidental release.

- ❖ 3(c)(x)(C), report information to off-site authorities during and after an accidental release.
- ❖ 3(c)(x)(D), assist off-site authorities in dealing with the adverse effects of an accidental release.
- ❖ 3(c)(x)(E), test the implementation of the measures to control the adverse effects of an accidental release.

Safeguards and Non-Proliferation

The regulatory foundation for the recommendation(s) associated with safeguards and non-proliferation includes the following:

- It is a requirement of the *General Nuclear Safety and Control Regulations* under paragraph 12(1)(i) that each licensee take all necessary measures to facilitate Canada's compliance with any applicable safeguards agreement.

- Under subsection 21(1) of the *General Nuclear Safety and Control Regulations,* information that concerns any of the following, including a record of that information, is prescribed information for the purposes of the Act:
  - 21(1)(a), a nuclear substance that is required for the design, production, use, operation or maintenance of a nuclear weapon or nuclear explosive device, including the properties of the nuclear substance.
  - 21(1)(b), the design, production, use, operation or maintenance of a nuclear weapon or nuclear explosive device.
  - 21(1)(c), the security arrangements, security equipment, security systems and security procedures established by a licensee in accordance with the Act, the regulations made under the Act or the licence, and any incident relating to security.
  - 21(1)(d), the route or schedule for the transport of Category I, II or III nuclear material, as defined in section 1 of the *Nuclear Security Regulations*.

- It is a requirement of the *General Nuclear Safety and Control Regulations* under subsection 30(1), that every licensee who becomes aware of any of the following situations shall immediately make a preliminary report to the Commission of the situation and of any action that the licensee has taken or proposes to take with respect to it:
  - 30(1)(a), interference with or an interruption in the operation of safeguards equipment or the alteration, defacement or breakage of a safeguards seal, other than in accordance with the safeguards agreement, the Act, the regulations made under the Act or the licence.

    30(1)(b), the theft, loss or sabotage of safeguards equipment or samples collected for the purpose of a safeguards inspection, damage to such equipment or samples, or the illegal use, possession, operation or removal of such equipment or samples.

- It is a requirement of the *General Nuclear Safety and Control Regulations* under subsection 30(2), that every licensee who becomes aware of a situation referred to in subsection (1) shall file a full report of the situation with the Commission within 21 days after becoming aware of it, unless some other period is specified in the licence, and the report shall contain the following information:
  - 30(2)(a), the date, time and location of becoming aware of the situation.
  - 30(2)(b), a description of the situation and the circumstances.
  - 30(2)(c), the probable cause of the situation.
  - 30(2)(d), the adverse effects on the environment, the health and safety of persons and the maintenance of national and international security that have resulted or may result from the situation.
- The 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*.
- The 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*.

Decommissioning Strategy and Financial Guarantees

The regulatory foundation for the recommendation(s) associated with Cameco's Rabbit Lake Operation post-decommissioning financial guarantees includes:

- 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.
- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*, in relation to the plan and description of the mine or mill:
  - 3(a)(viii), the proposed plan for the decommissioning of the mine or mill.

Licensee's Public Information Program

- It is a requirement of the *Uranium Mines and Mills Regulations* under section 3, that an application for a licence in respect of a uranium mine or mill, other than a licence to abandon, shall contain the following information in addition to the information required by section 3 of the *General Nuclear Safety and Control Regulations*, in relation to the environment and waste management:
  - 3(c)(i), the program to inform persons living in the vicinity of the mine or mill of the general nature and characteristics of the anticipated effects of the activity to be licensed on the environment and the health and safety of persons.

B.2 Detailed Summary of CNSC Assessment of Application

CNSC's staff assessment of Cameco's licence application for the RLO 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 Cameco**	**Complete?**	**Sufficient?**	**Adequate?**
(1) An application for a licence shall contain the following information:				
(a) the applicant's name and business address;	*RLO* – Mining Facility Licensing Manual	Y	Y	Y
(b) the activity to be licensed and its purpose;	*RLO* - Mining Facility Licensing Manual	Y	Y	Y
(c) the name, maximum quantity, and form of any nuclear substance to be encompassed by the licence;	*RLO* - Mining Facility Licensing Manual, Waste Management Program, Radiation Protection Program	Y	Y	Y
(d) a description of any nuclear facility, prescribed equipment, or prescribed information to be encompassed by the licence;	*RLO* - Mining Facility Licensing Manual, Facilities Program, Waste Management Program, Radiation Protection Program	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 Cameco**	**Complete?**	**Sufficient?**	**Adequate?**
(e) 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;*	*RLO* - Mining Facility Licensing Manual, Radiation Protection Program, Security Program, Transportation Program	Y	Y	Y
(f) the proposed measures to control access to the site of the activity to be licensed and the nuclear substance, prescribed equipment, or prescribed information;	*RLO* - Mining Facility Licensing Manual, Radiation Protection Program, Security Program	Y	Y	Y
(g) the proposed measures to prevent loss or illegal use, possession, or removal of the nuclear substance, prescribed equipment, or prescribed information;	*RLO* - Mining Facility Licensing Manual, Radiation Protection Program, Security Program	Y	Y	Y
(h) a description and the results of any test, analysis or calculation performed to substantiate the information included in the application;	*RLO* - Mining Facility Licensing Manual, Facilities Program, Radiation Protection Program, Waste Management Program, Security Program, Transportation Program	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 Cameco**	**Complete?**	**Sufficient?**	**Adequate?**
(i) 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;	*RLO* - Mining Facility Licensing Manual, Radiation Protection Program, Waste Management Program, Facilities Program	Y	Y	Y
(j) the applicant's organizational management structure insofar as it may bear on the applicant's compliance with the *Act* and the regulations made under the *Act*, including the internal allocation of functions, responsibilities and authority;	*RLO* - Mining Facility Licensing Manual	Y	Y	Y
(k) a description of any proposed financial guarantee relating to the activity to be licensed;	*RLO* - Mining Facility Licensing Manual, Preliminary Decommissioning Plan, Preliminary Decommissioning Cost Estimate	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 Cameco**	**Complete?**	**Sufficient?**	**Adequate?**
(l) any other information required by the *Act* or the regulations made under the *Act* for the activity to be licensed and the nuclear substance, nuclear facility, prescribed equipment or prescribed information to be encompassed by the licence.	*RLO* - Mining Facility Licensing Manual and programs	Y	Y	Y

B.3 Technical Basis

The technical basis for recommendations, including several guidance documents, national standards and regulatory documents has been presented in this CMD and is addressed in detail in the LCH for the Rabbit Lake Operation.

C. Safety and Control Area Framework

C.1 Safety and Control Areas Defined

The safety and control areas (SCAs) discussed in sections 3.1 through 3.14 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 3 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.
	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.

SAFETY AND CONTROL AREA FRAMEWORK		
Functional Area	**Safety and Control Area**	**Definition**
Core Control Processes	Radiation Protection	Covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. 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.
	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 *Treaty on the Non-Proliferation of Nuclear Weapons*.
	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 a uranium mine or mill:

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
Management	Management System	▪ Safety Culture
	Human Performance Management	▪ Personnel Training
	Operating Performance	▪ Not addressed individually
Facility and Equipment	Safety Analysis	▪ Hazard Analysis
	Physical Design	▪ Not addressed individually
	Fitness for Service	▪ Not addressed individually
Core Control Processes	Radiation Protection	▪ Estimated Dose to Public ▪ Application of ALARA ▪ Worker Dose Control ▪ Radiation Protection Program Performance ▪ Radiological Hazard Control
	Conventional Health and Safety	▪ Performance ▪ Practices ▪ Awareness
	Environmental Protection	▪ Effluent and Emissions Control (releases) ▪ Environmental Management System (EMS) ▪ Assessment and Monitoring ▪ Protection to the Public ▪ Environmental Risk Assessment
Core Control Processes (cont.)	Emergency Management and Fire Protection	▪ Nuclear Emergency Preparedness and Response ▪ Fire Emergency Preparedness and Response
	Waste Management	▪ Waste Rock Piles ▪ Tailings Management Facilities ▪ Solid and Liquid Wastes ▪ Decommissioning Plans
	Security	▪ Not addressed individually

SPECIFIC AREAS FOR THIS FACILITY TYPE		
Functional Area	**Safety and Control Area**	**Specific Areas**
	Safeguards and Non-Proliferation	▪ Not addressed individually
	Packaging and Transport	▪ Not addressed individually

PART 2

Part 2 of this CMD provides all relevant information pertaining directly to the Rabbit Lake Operation 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

e-Doc 6354654 (PDF)

URANIUM MINE AND MILL LICENCE
CAMECO CORPORATION
RABBIT LAKE OPERATION

I) LICENCE NUMBER: UML-MINEMILL-RABBIT.01/2023

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

Cameco Corporation
2121 – 11th Street West
Saskatoon, Saskatchewan S7M 1J3
Corporate Number 332981-0

III) LICENCE PERIOD:

This licence is valid from November 1, 2013 to October 31, 2023, unless otherwise suspended, amended, revoked, replaced, or transferred.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

a) prepare a site for and construct, operate, modify and decommission a nuclear facility (hereinafter "the facility") for the mining of uranium ore and the production of uranium concentrate at a site known as the Rabbit Lake Operation in the province of Saskatchewan as shown on the drawing referenced in appendix A to this licence;

b) mine a nuclear substance (uranium ore);

c) produce a uranium concentrate;

d) possess, transfer, import, use, store, and dispose of nuclear substances; and

e) possess, transfer, import, and use prescribed equipment that is required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (a), (b) and (c).

V) EXPLANATORY NOTES:

a) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.

b) 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 its associated Regulations.

c) The UML-MINEMILL-RABBIT.01/2023 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission staff to assess the licensee's compliance with the conditions listed in this licence. The LCH also provides information regarding delegation of authority and applicable version control of documents comprising compliance verification criteria.

VI) CONDITIONS:

G. GENERAL

G.1 Licensing Basis for Licensed Activities

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;

(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.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.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1. MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

2. HUMAN PERFORMANCE MANAGEMENT

2.1 Training Program

The licensee shall implement and maintain a training program.

3. OPERATING PERFORMANCE

3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

3.3 Nuclear Substances and Radiation Devices

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

4. SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5. PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

6. FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7. *RADIATION PROTECTION*

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 24 hours.

8. *CONVENTIONAL HEALTH AND SAFETY*

8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

9. ENVIRONMENTAL PROTECTION

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 24 hours.

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11. WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The licensee shall maintain a decommissioning plan.

12. SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

13. SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

14. PACKAGING AND TRANSPORT

14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

SIGNED at OTTAWA, this 9th day of March 2021.

Velshi, Rumina

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Reason: I am the author of this document
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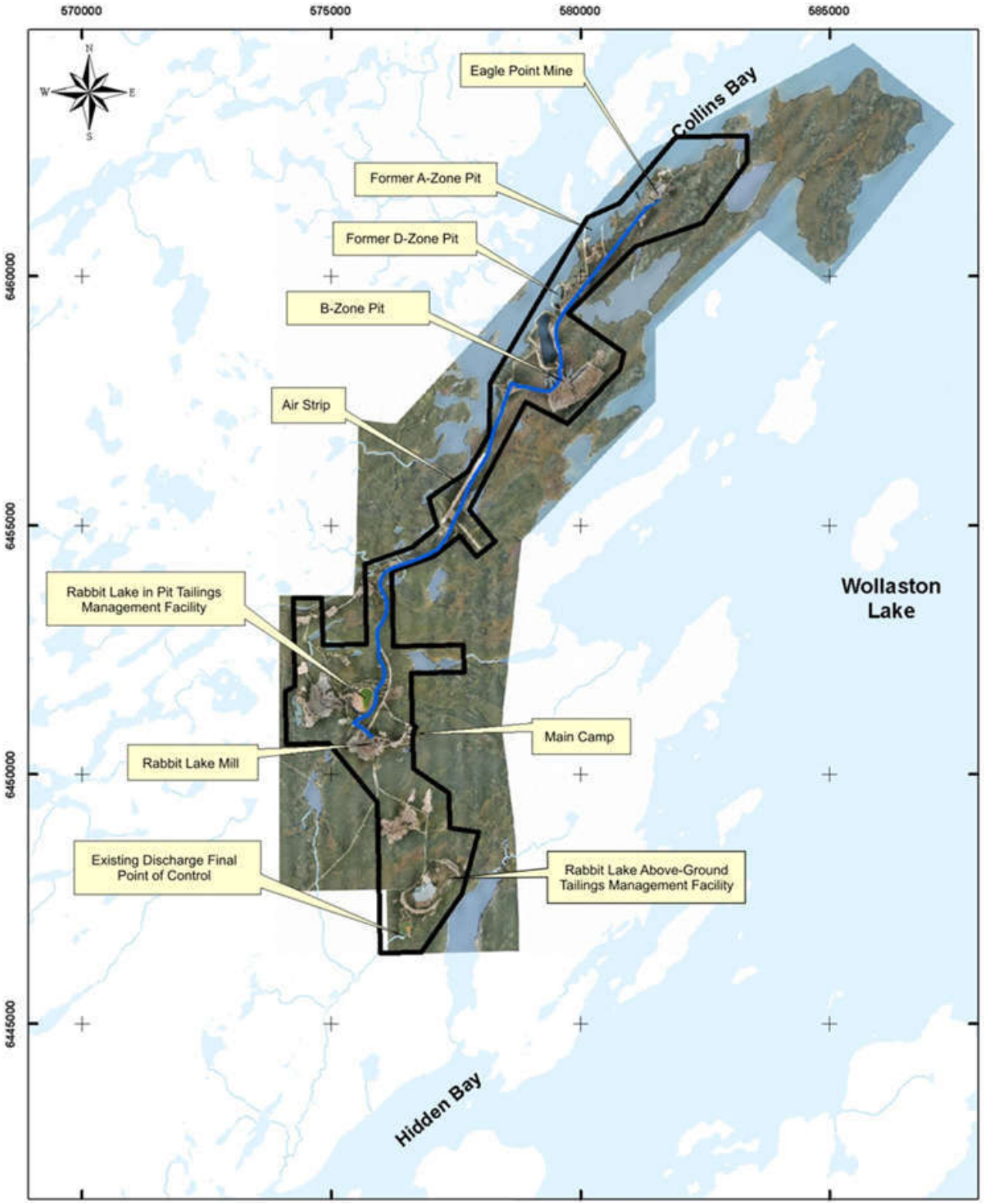
Rumina Velshi, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF CAMECO'S OPERATION AT RABBIT LAKE

The location of Cameco's operation at Rabbit Lake is shown on e-Doc 4177921.

Rabbit Lake Operation Location, Surface Lease Outline and Major Facilities
(courtesy Cameco Corporation)



Proposed Licence Changes

Overview

There is one change to licence conditions with the addition of 15) Facility Specific (licence condition provided in Licence Conditions section). The licence term recommended is for a 15-year period.

Licence Conditions

There is one new licence condition, provided below:

15.1 Commissioning Report

The licensee shall submit a commissioning report to the Commission, or a person authorized by the Commission, in the event of a return to operations.

Licence Format

The licence format was updated previously as part of CMD 20-H107. No new changes to the licence format are proposed for this CMD.

Licence Period

Cameco has requested a renewal of its licence for a 20-year period. As discussed in section 5.5 of this CMD, CNSC staff are recommending that the Commission approve the renewal of Cameco's licence for the Rabbit Lake Operation for a 15-year period.

CNSC staff's assessment has determined that a 15-year licence term is more appropriate as the site has been in a state of care and maintenance for an extended period of time (since 2016) with no indication by the licensee that this will change in the foreseeable future. In addition, since the RLO is an older facility, a return to production would require commissioning reports and assessments by Cameco to clearly demonstrate it has ensured safety through the transition back to operations.

CNSC staff have concluded that a 15-year licence term is acceptable following an assessment of Cameco's application and supporting documents and considering Cameco's satisfactory performance history across all SCAs during the previous licence period. Additionally, CNSC staff have also given consideration to the risk profile of the Rabbit Lake Operation, the ability of CNSC's regulatory framework to support a uranium mine licence for a 15-year period, including the continued ability to provide appropriate public and Indigenous engagement. Based on these considerations, and recent decisions issued by the Commission, CNSC staff are recommending the Commission approve CNSC staff's request for a renewal of the Rabbit Lake Operation licence for a 15-year period.

Proposed Licence

e-Doc 6954416 (PDF)

DRAFT

URANIUM MINE AND MILL LICENCE
CAMECO CORPORATION
RABBIT LAKE OPERATION

I) LICENCE NUMBER: UML-MINEMILL-RABBIT.00/2038

II) LICENSEE: Pursuant to section 24 of the *Nuclear Safety and Control Act*, this licence is issued to:

Cameco Corporation
2121 – 11th Street West
Saskatoon, Saskatchewan S7M 1J3
Corporate Number 332981-0

III) LICENCE PERIOD:

This licence is valid from November 1, 2023 to October 31, 2038, unless otherwise suspended, amended, revoked or replaced.

IV) LICENSED ACTIVITIES:

This licence authorizes the licensee to:

a) prepare a site for, construct, operate, modify and decommission a nuclear facility (hereinafter "the facility") for the mining of uranium ore and the production of uranium concentrate at a site known as the Rabbit Lake Operation in the Province of Saskatchewan as shown on the drawing referenced at Appendix A to this licence.

b) mine a nuclear substance (uranium ore)

c) produce a uranium concentrate;

d) import, possess, use, store, transfer and dispose of nuclear substances and radiation devices that are required for or associated with laboratory studies, field studies, fixed gauge usage and borehole logging devices in relation to (a), (b) and (c).

V) EXPLANATORY NOTES:

a) Nothing in this licence shall be construed to authorize non-compliance with any other applicable legal obligation or restriction.

b) 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 its associated Regulations.

c) The UML-MINEMILL-RABBIT.00/2038 Licence Conditions Handbook (LCH) identifies the criteria that will be used by Canadian Nuclear Safety Commission staff to assess the licensee's compliance with the conditions listed in this licence. The LCH also provides information regarding delegation of authority and applicable version control of documents comprising verification criteria.

VI) CONDITIONS:

G. GENERAL

G.1 Licensing Basis for Licensed Activities

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;

(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.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.

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

1. MANAGEMENT SYSTEM

1.1 Management System

The licensee shall implement and maintain a management system.

2. HUMAN PERFORMANCE MANAGEMENT

2.1 Training Program

The licensee shall implement and maintain a training program**.**

3. OPERATING PERFORMANCE

3.1 Operations Program

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

3.2 Reporting Requirements

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

3.3 Nuclear Substances and Radiation Devices

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

4. SAFETY ANALYSIS

4.1 Safety Analysis Program

The licensee shall implement and maintain a safety analysis program.

5. PHYSICAL DESIGN

5.1 Design Program

The licensee shall implement and maintain a design program.

6. FITNESS FOR SERVICE

6.1 Fitness for Service Program

The licensee shall implement and maintain a fitness for service program.

7. RADIATION PROTECTION

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 24 hours.

8. CONVENTIONAL HEALTH AND SAFETY

8.1 Conventional Health and Safety Program

The licensee shall implement and maintain a conventional health and safety program.

9. ENVIRONMENTAL PROTECTION

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 24 hours.

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

10.1 Emergency Preparedness Program

The licensee shall implement and maintain an emergency preparedness program.

10.2 Fire Protection Program

The licensee shall implement and maintain a fire protection program.

11. WASTE MANAGEMENT

11.1 Waste Management Program

The licensee shall implement and maintain a waste management program.

11.2 Decommissioning Plan

The licensee shall maintain a decommissioning plan.

12. SECURITY

12.1 Security Program

The licensee shall implement and maintain a security program.

13. SAFEGUARDS AND NON-PROLIFERATION

13.1 Safeguards Program

The licensee shall implement and maintain a safeguards program.

14. PACKAGING AND TRANSPORT

14.1 Packaging and Transport Program

The licensee shall implement and maintain a packaging and transport program.

15. FACILITY SPECIFIC

15.1 Commissioning Report

The licensee shall submit a commissioning report to the Commission, or a person authorized by the Commission, in the event of a return to operations.

SIGNED at OTTAWA, this XX day of XX, 2023.

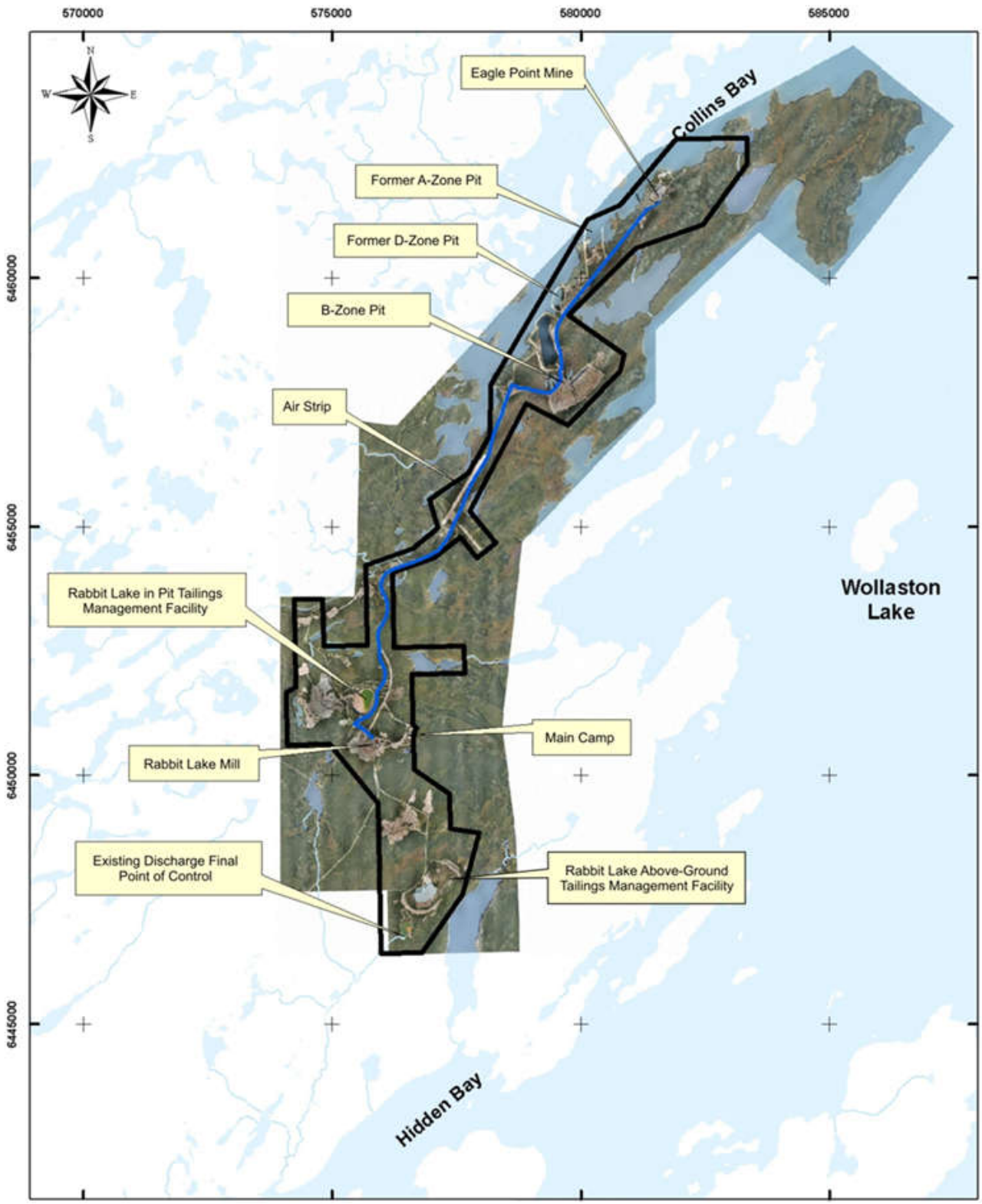
_____
Rumina Velshi, President
on behalf of the Canadian Nuclear Safety Commission

APPENDIX A

LOCATION OF CAMECO'S OPERATION AT RABBIT LAKE

The location of Cameco's Rabbit Lake Operation is provided on the following diagram.

Rabbit Lake Operation Location, Surface Lease Outline and Major Facilities
(courtesy Cameco Corporation)



Draft Licence Conditions Handbook

e-Doc 6954181 (PDF)

Canada's Nuclear Regulator

e-Doc 6886583 (Word)
e-Doc 6954181 (PDF)

LICENCE CONDITIONS HANDBOOK

LCH-MINEMILL-RABBIT.00/2038

RABBIT LAKE OPERATION
URANIUM MINE AND MILL LICENCE

UML-MINEMILL-RABBIT.00/2038

DRAFT

Revision 0

Canadian Nuclear Safety Commission
Commission canadienne de sûreté nucléaire

Canada

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Licence Conditions Handbook **Effective: October XX, 2023**

LCH-MINEMILL-RABBIT.00/2038, Revision 0

Rabbit Lake Operation

Uranium Mine and Mill Licence

UML-MINEMILL-RABBIT.00/2038

(Effective: October XX, 2023)

SIGNED at OTTAWA this XX day October, 2023

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Patrick Burton, Director
Uranium Mines and Mills Division
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CANADIAN NUCLEAR SAFETY COMMISSION

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Revision History:

Effective Date	Revision	Section(s) changed	Description of the Changes	DCR e-DOC
October XX, 2023	0	N/A	Original document	6886583 (Word) 6954181 (PDF)

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PART I: INTRODUCTION

The purpose of the licence conditions handbook (LCH) is to identify and clarify the relevant parts of the licensing basis for each licence condition (LC). This will help ensure that the licensee will maintain facility operations in accordance with the licence and the intent of the licensing basis. The LCH also provides information regarding delegation of authority, document version control and conflict resolution. The LCH should be read in conjunction with the licence.

The LCH has 3 parts under each LC: the Preamble, Compliance Verification Criteria (CVC), and Guidance. The Preamble explains the regulatory context, background, and/or history related to the LC. CVC are used by Canadian Nuclear Safety Commission (CNSC) staff to oversee compliance with the LC. Guidance is non-mandatory information, including direction on how to comply with the LC.

The statement "a person authorized by the Commission" in the LCs or the LCH indicates that the Commission may delegate certain authority to CNSC staff. Unless otherwise specified, the delegation of authority by the Commission to act as a person authorized by the Commission (Delegated Officer) is only applied to incumbents in the following positions:

- Director, Uranium Mines and Mills Division
- Director General, Directorate of Nuclear Cycle and Facilities Regulation
- Executive Vice-President and Chief Regulatory Operations Officer, Regulatory Operations Branch

PART II: FRAMEWORK FOR EACH CONDITION

G. GENERAL

G.1 Licensing Basis for Licensed Activities

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;

(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 (hereafter "the Commission").

Preamble

Licence condition G.1 requires activities (defined in Part IV of the licence) be conducted in accordance with the licensing basis. Further information on the licensing basis is available in CNSC regulatory document, REGDOC-3.5.3 *Regulatory Fundamentals*.

The licensing basis, established by the Commission at the time the licence is issued, sets the boundary conditions for a regulated activity, and establishes the basis for the CNSC's compliance program for that regulated activity.

Part (i) of licence condition G.1 includes, but is not limited to, the following:

- *Nuclear Safety and Control Act*
- *General Nuclear Safety and Control Regulations*
- *Uranium Mines and Mills Regulations*
- *Radiation Protection Regulations*
- *Packaging and Transport of Nuclear Substances Regulations, 2015*
- *Nuclear Substances and Radiation Devices Regulations*
- *Metal and Diamond Mining Effluent Regulations*
- Canada/International Atomic Energy Agency (IAEA) Safeguards Agreements

The safety and control measures mentioned under Parts (ii) and (iii) of licence condition G.1 have the potential to affect the health and safety of people, the environment, security or international obligations to which Canada agrees. These measures may be found in high-level programmatic documents but might also be found in lower level supporting documentation. Safety and control measures can also be found in licensing basis publications such as CNSC regulatory documents, CSA Group standards or licensee documentation submitted in support of a licence.

The CNSC licence authorizes Cameco Corporation (Cameco) to conduct the following undertakings at the Rabbit Lake Operation, for which the CNSC provides regulatory oversight:

- operation of the Eagle Point underground mine
- processing of uranium ore
- production of up to 4.25 million kilograms of uranium per year from the mill
- operation of the water treatment plant
- storage of clean and mineralized waste rock
- handling and storage of hazardous materials and disposal of hazardous wastes
- possession, storage, transfer, importation, use and disposal of nuclear substances
- possession, transfer, importation, and use of radiation devices

The *Environmental Impact Statement for the Rabbit Lake Solution Processing Project* (January 2008) considered production of 6.5 million kilograms of uranium from the Rabbit Lake mill. Cameco is required to provide notification to the CNSC before increasing production rate above 4.25 million kilograms of uranium or processing new sources of ore so that it can be verified that the proposed activities meet CNSC requirements and remain within the licensing basis for the Rabbit Lake Operation.

Compliance Verification Criteria

Licensing Basis Documents

Licensing basis documents are listed in Appendix B and C in addition to tables under the most relevant LC. All “shall” or normative statements in licensing basis publications are considered CVC unless stated otherwise. If any “should” or informative statements in licensing basis publications are also considered CVC, this is provided under the most relevant LC.

In the event of any inconsistency between 2 elements of the licensing basis, the licensee shall consult CNSC staff to determine the approach to resolve the issue.

For operational activities that are not in accordance with the licensing basis, the licensee shall take action as soon as practicable to return to a state that is compliant with the licensing basis, taking into account the risk significance of the situation. Reporting requirements are outlined in CNSC’s REGDOC-3.1.2, *Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills* and discussed under LC 3.2 of this LCH.

Changes to documentation or activities that result in operational activities not being in accordance with the licensing basis must be approved by the Commission prior to implementation.

Guidance

When the licensee becomes aware that a proposed change or activity might not be in accordance with 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. Guidance for notifications to the CNSC related to licensee changes are discussed under LC G.2.

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

During the course of licensed activities, it is expected that the licensee may make changes to implement improvements or to address changes in operational needs. While making these changes, it is imperative the licensee remains within the bounds of the licensing basis.

Appendix B provides a list of licensee documents that require notification of change.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Changes to the design, operating conditions, policies, programs and methods that have the potential to be outside of the licensing basis require prior written notification to the CNSC. CNSC staff will confirm the change remains within the licensing basis and notify the licensee prior to implementation of the change by the licensee. 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. Regular communication between the CNSC and the licensee should ensure review timelines are established prior to submission of prior written notification. It remains the responsibility of the licensee to ensure that the Rabbit Lake Operation continues to operate within the bounds of the licensing basis.

Prior written notification shall include:

- a description of the change
- the rationale for the change
- expected duration (if not a permanent change)
- an explanation from the licensee supporting the conclusion that the change remains in accordance with the licensing basis.

Ongoing regular communication shall be maintained between the CNSC and licensee.

Guidance

A list of criteria to determine if a change would be in accordance with the licensing basis is provided in Appendix A of CNSC process document *Overview of: Assessing licensee changes to documents or operations* (e-Doc 4055483).

G.3 Financial Guarantee

The licensee shall maintain a financial guarantee for decommissioning that is acceptable to the Commission.

Preamble

The licensee is responsible for all costs of decommissioning at the facility. All such costs are included in the licensee's decommissioning cost estimates and are covered by the licensee's financial guarantee for decommissioning. The licensee's decommissioning cost estimate is provided in the facility's preliminary decommissioning plan. The facility's current financial guarantee is covered by specific financial instruments as listed below

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294-19
CNSC	Decommissioning	REDOC-2.11.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Preliminary Decommissioning Plan	6311196	Yes
Cameco	Preliminary Decommissioning Cost Estimate	6312122	Yes
Cameco	RAM P982109 ($53,877,800.00)	6763599	Yes
Cameco	RAM S10009 285005 ($62,022,200.00)	6763605	Yes
Cameco	RAM BMTO434911OS ($97,500,000.00)	6763609	Yes

The financial guarantee for decommissioning the Rabbit Lake Operation shall be reviewed and revised by the licensee every 5 years; when required by the Commission; or following a revision of the preliminary decommissioning plan that significantly impacts the financial guarantee. The Rabbit Lake Operation financial guarantee was last revised in March 2021. An updated financial guarantee, submitted by Cameco in December 2022, is currently being reviewed against regulatory requirements.

The licensee shall submit a written report to the Commission confirming that the financial instruments continue to meet the acceptance criteria of subsection 5.1 of CNSC's Regulatory Guide G-206, *Financial Guarantees for the Decommissioning of Licensed Activities* (or s.3 of CNSC's REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities* following implementation by the licensee). Any change to the type of financial instrument requires prior notification to the CNSC. The licensee shall submit this report by the end of March of each year, or at any time as the Commission may request.

Guidance

There is no guidance provided for this licence condition.

G.4 Public Information and Disclosure

The licensee shall implement and maintain a public information and disclosure program.

Preamble

The public information and disclosure program ensures that information related to the health and safety of persons and the environment and other issues associated with the lifecycle of the nuclear facility is effectively communicated to the public. In addition, the program shall include a commitment to and protocol for ongoing timely communications regarding emissions, effluent releases, unplanned events and other incidents and activities related to the licensed facility that may be of interest to the public.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Public Information and Disclosure	REGDOC-3.2.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Public Information Program	6782956	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Indigenous Engagement	REGDOC-3.2.2

1. MANAGEMENT SYSTEM

Licence Condition 1.1

The licensee shall implement and maintain a management system.

Preamble

The "management system" safety and control area covers the framework which 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 management system must satisfy the requirements set out in the *Nuclear Safety and Control Act* (NSCA), regulations made pursuant to the NSCA, the licence and the measures necessary to ensure that safety is of paramount consideration in implementation of the management system. An adequately established and implemented management system provides the evidence that the licensing basis remains valid.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities (except sections identified under other license conditions)	N286-12
CNSC	Safety Culture	REGDOC-2.1.2

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Quality Management Program	6696194	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Management System	REGDOC-2.1.1

2. HUMAN PERFORMANCE MANAGEMENT

Licence Condition 2.1

The licensee shall implement and maintain a training program.

Preamble

The "human performance management" safety and control area covers activities that enable effective human performance through the development and implementation of processes that ensure a sufficient number of licensee workers are in all relevant job areas and have the necessary knowledge, skills, procedures and tools in place to safely perform their duties.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Personnel Training	REGDOC-2.2.2

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Training and Development Program	6936509	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Human Factors	REGDOC-2.2.1

3. OPERATING PERFORMANCE

Licence Condition 3.1

The licensee shall implement and maintain an operating program, which includes a set of operating limits.

Preamble

The "operating performance" safety and control area includes an overall review of the conduct of the licensed activities and the activities that enable effective performance.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Quality Management Program	6696194	Yes
Cameco	Environmental Code of Practice (Appendix A of the Environmental Protection Program – Code of Practice)	6615434	Yes
Cameco	Radiation Code of Practice (Appendix C of Radiation Protection Program – Code of Practice)	6615433	Yes
Cameco	Waste Management Program	6878858	Yes
Cameco	Eagle Point Mine Program	6936517	Yes
Cameco	Mill Operations Program	6793534	Yes

Guidance

There is no guidance provided for this licence condition.

Licence Condition 3.2

The licensee shall implement and maintain a program for reporting to the Commission or a person authorized by the Commission.

Preamble

This LC requires the licensee to implement and maintain a process for reporting information to the CNSC. This includes monitoring results, changes to facilities or approved activities, performance assessments and the occurrence of unusual events. Sections 29 and 30 of the *General Nuclear Safety and Control Regulations,* section 38 of the *Nuclear Substances and Radiation Devices Regulations* and section 16 of the *Radiation Protection Regulations* provides further insight into reportable events.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills*	REGDOC-3.1.2

* Modified reporting requirements for false alarms and Emergency Response Team (ERT) responses, where ERT activation is not directly related to the licensed activity, are described in a October 4, 2021 letter from CNSC to Cameco (P. Fundarek to K. Nagy, e-Doc 6653493).

The licensee shall report effluent concentrations that reach or exceed the discharge limits in the *Metal and Diamond Mining Effluent Regulations* in addition to requirements outlined in CNSC's REGDOC-3.1.2.

The licensee shall submit to the CNSC within 90 days after the end of each quarter of a calendar year, the results of the:

- radiation monitoring program
- environmental monitoring program

Results from the above monitoring programs are also to include quality assurance and quality control information. More frequent reporting may be requested on a case-by-case basis.

The licensee shall issue worker radiation dose records within 90 days after the end of each quarter of a calendar year, to:

- the worker
- the CNSC
- the National Dose Registry (NDR)

The licensee shall submit to the CNSC an annual compliance report by March 31 of each year, covering the operation for the 12-month period from January 1 to December 31 of the previous year.

OPERATING PERFORMANCE

Guidance

Guidance Publications

Source	Document Title	CNSC e-Access Document Number
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010	3678482

Licence Condition 3.3

The licensee shall implement and maintain a program for nuclear substances and radiation devices.

Preamble

Licensees must ensure they receive CNSC approval before the import, possession, use, storage, transfer, or disposal of nuclear substances and radiation devices, except as specified in the tables for this section. It is the responsibility of the licensee to ensure that they have CNSC authorization for the import or export of any nuclear substances and radiation devices.

The possession limits for unsealed nuclear substances does not apply to natural uranium and its decay products which originate in the mining or ore-treatment streams.

It is also important to note that there is no possession limit on the number of sealed nuclear sources or radiation devices.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Licence Application Guide Nuclear Substances and Radiation Devices, version 2 (excluding section 2)	REGDOC-1.6.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Radiation Protection Program (Appendix B – Authorized Nuclear Substance List)	6615433	Yes

The authorized possession limits for unsealed nuclear substances are:

Nuclear Substance	Maximum Total Quantity in Possession
Radium-226	1 MBq
Barium-133	6 MBq

The maximum authorized quantity of nuclear substances per sealed source is:

Nuclear Substance	Maximum Quantity per Sealed Source
Americium-241/Curium-244/ Plutonium 239	7 kBq
Cesium-137	1.4 MBq
Bismuth-210/Lead-210	4.4 kBq
Polonium-210	3.7 MBq

OPERATING PERFORMANCE

The authorized make and model of radiation devices and the maximum quantity of nuclear substance per each device are:

Radiation Device Make and Model	Nuclear Substance	Maximum Quantity per Radiation Device
VEGA Americas, Inc. SH-100; Previous manufacturer name: Ohmart/Vega	Cesium-137	3,700 MBq
VEGA Americas / Ohmart VEGA SR-1A	Cesium-137	9,250 MBq
VEGA Americas / Ohmart VEGA SH-F1B	Cesium-137	4,400 MBq
VEGA Americas / Ohmart VEGA SR-A	Cesium-137	3,700 MBq
VEGA Americas / Ohmart VEGA SH-F1A	Cesium-137	370 MBq
Thermo Fisher Scientific 5200 Previous manufacturer name: Thermo MeasureTech Canada Inc. / Texas Nuclear Corporation	Cesium-137	1,850 MBq

Note: Includes provision for replacement sources for these radiation devices.

The management of nuclear substances and radiation devices will be evaluated against:

3.3.1 A radioisotope safety poster approved by the Commission or a person authorized by the Commission, which corresponds to the classification of the area, room or enclosure, is posted in a readily visible location in areas, rooms or enclosures where these listed nuclear substances are handled.

3.3.2 When in storage, radioactive nuclear substances or radiation devices are accessible only to persons authorized by the licensee; the dose rate at any occupied location outside the storage area, room or enclosure resulting from the substances or devices in storage does not exceed 2.5 mSv/h and measures are in place to ensure that the dose limits in the *Radiation Protection Regulations* are not exceeded as a result of the substances or devices in storage.

Guidance

There is no guidance provided for this licence condition.

4. SAFETY ANALYSIS

Licence Condition 4.1

The licensee shall implement and maintain a safety analysis program.

Preamble

The "safety analysis" safety and control area includes the systematic evaluation of the potential hazards associated with the proposed activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Environmental Protection Program	687854	Yes
Cameco	Waste Management Program	6878858	Yes
Cameco	Occupational Health and Safety Program	6936505	Yes

The safety analysis program will be evaluated against the following principles:

4.1.1 A process has been implemented and maintained to identify, assess, and eliminate or control health and safety and environmental risks associated with existing and new processes or changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

4.1.2 Risks to health, safety and the environment have been identified, assessed, eliminated or controlled for existing and new processes or for changes to work procedures, equipment, organizational structure, staffing, products, services and suppliers.

4.1.3 Appropriate methodologies are used to identify potential hazards and consider the effectiveness of preventative measures and strategies in reducing the effects of such hazards.

4.1.4 Modeling is regularly updated using measured values to replace important assumptions and to increase the certainty of predicted long-term behaviour of contaminants.

Job hazard assessments conducted when planning non-routine and complex work activities are discussed under operating performance.

Guidance

There is no guidance provided for this licence condition.

5. PHYSICAL DESIGN

Licence Condition 5.1

The licensee shall implement and maintain a design program.

Preamble

The "physical design" safety and control area relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis given new information arising over time and taking changes in the external environment into account.

The design basis is the range of conditions and events taken into account in the design of structures, systems and components of a facility according to established criteria, such that the facility can withstand them without exceeding authorized limits for the planned operation of safety systems.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Design of Uranium Mines and Mills: Ventilation Systems*	REGDOC-2.5.4
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

* Applicable when applying for a CNSC licence to prepare a site for and construct, operate or decommission a uranium mine or mill.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Eagle Point Mine Program	6936517	Yes
Cameco	Mill Operations Program	6793534	Yes
Cameco	Quality Management Program	6696194	Yes

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	General Design Considerations: Human Factors	REGDOC-2.5.1

6. FITNESS FOR SERVICE

Licence Condition 6.1

The licensee shall implement and maintain a fitness for service program.

Preamble

The "fitness for service" safety and control area 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 ensure equipment is available to perform its intended design function when called upon to do so.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Management System Requirements for Nuclear Facilities	N286-12

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Maintenance Program	6830250	Yes

The fitness for service program will also be assessed against:

6.1.1 Systems, equipment, and devices are maintained in good working order such that they can perform their design function.

6.1.2 Instruments, controls and associated indicators are maintained operational and in calibration. Method and interval of calibrations are defined, and records of calibrations are kept.

6.1.3 Preventative and corrective maintenance processes and systems have been implemented and are maintained.

6.1.4 Regular inspection and testing of critical infrastructure and equipment are carried out.

6.1.5 A process has been implemented to identify, plan and schedule maintenance activities.

6.1.6 Maintenance, testing, surveillance and inspection backlogs are monitored and minimized.

6.1.7 Methods are used to show the current acceptance and operating status, and to prevent the use of systems, equipment or devices that are inaccurate, uncalibrated or not in working order.

6.1.8 When deviations beyond accuracy limits are found or suspected, their consequence on past results, and on present performance is evaluated.

6.1.9 A process exists to verify that changes to calibration, testing and maintenance requirements due to system and equipment modifications and replacements are implemented.

Guidance

There is no guidance provided for this licence condition.

7. RADIATION PROTECTION

Licence Condition 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 24 hours.

Preamble

The "radiation protection" safety and control area covers the implementation of a radiation protection program in accordance with the *Radiation Protection Regulations*. This program must ensure that contamination and radiation doses received are monitored, controlled, kept as low as reasonably achievable (ALARA), with social and economic factors being taken into account.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Radiation Protection Program	6941559	Yes

The radiation protection (RP) program will be assessed against the following principles:

7.1.1 Radiological conditions are monitored, and sources of internal and external radiation exposures are controlled. Access and work in radiological areas are controlled so that collective and individual radiation exposures are kept in accordance with the ALARA principle.

7.1.2 RP instrumentation and equipment are calibrated, maintained and used so that radiation levels are accurately determined. Uncalibrated equipment is removed from use.

7.1.3 The personal dosimetry program ensures that external and internal radiation doses to individuals are accurately determined and recorded.

7.1.4 Appropriate contamination control measures are implemented to control and minimize the contamination of areas, equipment and personnel.

7.1.5 Effective decontamination control measures are implemented to control and prevent the contamination of areas, equipment and personnel.

Action levels (AL) are designed to alert licensees before regulatory dose limits are reached. By definition, if an AL referred to in a licence is reached, a loss of control of some part of the associated RP program may have occurred and specific action is required, as defined in the *Radiation Protection Regulations*, the licence and the applicable code of practice.

Action Level	Dose (mSv)
Weekly Action Level	1
Quarterly Action Level	5

The weekly AL is assessed against official dosimetry results or engineering monitoring data. The quarterly AL is assessed against official dosimetry results. The licensee is expected to review and, if necessary, revise the ALs specified above at least once every 5 years in order to validate their effectiveness. The results of such reviews should be provided to the CNSC.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Radiation Protection	REGDOC-2.7.1
CNSC	Dosimetry, Volume I: Ascertaining Occupational Dose	REGDOC-2.7.2
CNSC	Measuring Airborne Radon Progeny at Uranium Mines and Mills	G-4
CNSC	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218

8. CONVENTIONAL HEALTH AND SAFETY

Licence Condition 8.1

The licensee shall implement and maintain a conventional health and safety program.

Preamble

The "conventional health and safety" safety and control area covers the implementation of a program to manage workplace safety hazards and to protect personnel and equipment.

The regulation of non-radiological health and safety at uranium mines and mills is governed by the *Canada Labour Code Part II*, which is administered by Employment and Social Development Canada (ESDC). However, the *Saskatchewan Uranium Mines and Mills Exclusion Regulations* (SOR/2001-115) defer the regulation of occupational health and safety in Saskatchewan uranium mines and mills to the province of Saskatchewan in accordance with the requirements of *The Mines Regulations, 2018* Part II *Revised Regulations of Saskatchewan*.

The CNSC also has regulatory responsibilities for the oversight of the protection of the health and safety of workers. The CNSC harmonizes the oversight of conventional health and safety with the Saskatchewan Ministry of Labour Relations and Workplace Safety.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Notification Requirements
Cameco	Mining Facility Licensing Manual	641575	Yes
Cameco	Occupational Health and Safety Program	693650	Yes

The conventional health and safety program will be assessed against the following principles:

8.1.1 Housekeeping standards have been identified and are enforced to ensure that work areas are kept clean and organized.

8.1.2 Facilities, processes and procedures have been implemented to ensure the safe management of hazardous materials.

8.1.3 Employees and contractors actively participate in the management of conventional health and safety.

8.1.4 Management verifies that employees and contractors actively participate in the management of health and safety in their workplace.

8.1.5 A process has been established and maintained to monitor, measure and record conventional health and safety performance and the effectiveness of the occupational health and safety program on a regular basis.

8.1.6 Routine inspections are performed by workers, supervisors, senior staff and/or safety professionals to identify any potential safety issues.

8.1.7 Processes and procedures are established and maintained to investigate accidents and incidents, to identify root causes, to implement corrective actions and to verify that corrective actions have been completed and will effectively prevent recurrence.

8.1.8 Procedures have been implemented and maintained for reporting work-related injuries, illnesses, fatalities and conventional health and safety incidents including near misses.

8.1.9 The causes of injuries are investigated, corrective actions implemented, and the effectiveness of corrective actions verified.

8.1.10 A preventative and corrective action procedure has been established and maintained to address non-conformances and inadequately controlled risks.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Conventional Health and Safety	REGDOC-2.8.1

9. ENVIRONMENTAL PROTECTION

Licence Condition 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 24 hours.

Preamble

The "environmental protection" safety and control area 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.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures, version 1.2	REGDOC-2.9.1
CSA Group	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.4-10
CSA Group	Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.5-11
CSA Group	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	N288.6-12
CSA Group	Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.7-15
CSA Group	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	N288.8-17

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Environmental Protection Program	6782961	Yes
Cameco	Environmental Code of Practice (Appendix A of the Environmental Protection Program – Code of Practice)	6615434	Yes
Cameco	Waste Management Program	6878858	Yes
Cameco	Quality Management Program	6696194	Yes
Cameco	Environmental Performance Report, 2020	6451233	Yes
Cameco	Environmental Risk Assessment, 2020	6451247	Yes

To ensure the applicable environmental protection measures have been established, implemented and maintained, the environmental protection program will also be assessed against:

9.1.1 Action levels specified in the environmental code of practice. When the licensee becomes aware that an action level has been triggered, the licensee shall notify the Commission within 24 hours and take specific action as defined in the *Uranium Mines and Mills Regulations* and the environmental code of practice.

9.1.2 The authorized release limits as specified below. When the licensee becomes aware that an authorized release limit has been reached or exceeded, the licensee shall immediately notify the Commission, investigate, and take corrective action to ensure that the releases are maintained below the authorized release limits.

The authorized liquid effluent release limits are:

Deleterious Substance	Maximum Authorized Monthly Mean Concentration	Maximum Authorized Concentration in a Composite Sample	Maximum Authorized Concentration in a Grab Sample
Arsenic (mg/L)	0.30	0.45	0.60
Copper (mg/L)	0.30	0.45	0.60
Lead (mg/L)	0.10	0.15	0.20
Nickel (mg/L)	0.50	0.75	1.00
Zinc (mg/L)	0.50	0.75	1.00
Un-ionized Ammonia (mg/L)	0.50	N/A	1.00
Total Suspended Solids (mg/L)	15.00	22.50	30.00
Radium-226 (Bq/L)	0.37	0.74	1.11

Acid balance (as H_3O^+) reported as pH	In a range of 6.0 to 9.5

Acutely Lethal Effluent	0%

Notes:

1) Authorized release limits have been harmonized, where available, with those required under the *Metal and Diamond Mining Effluent Regulations* (MDMER).

2) Definition of Units: mg/L = milligrams per litre
Bq/L = becquerels per litre

3) All concentrations and activities are total values.

4) "Monthly mean concentration" means the average value of the concentrations measured in all composite or grab samples collected from the final discharge point during each month when a deleterious substance is deposited.

5) "Composite sample" means:
   (a) a quantity of effluent consisting of not less than three equal volumes or three volumes proportionate to flow that have been collected at approximately equal time intervals over a period of not less than seven hours and not more than 24 hours; or
   (b) a quantity of effluent collected continuously at a constant rate or at a rate proportionate to the rate of flow of the effluent over a sampling period of not less than seven hours and not more than 24 hours.

6) "Grab sample" means a quantity of undiluted effluent collected at any given time.

7) *"Acutely lethal" (Source MDMER),* in respect of an effluent, means that the effluent at 100 percent concentration kills

a) more than 50 percent of the rainbow trout subjected to it for a period of 96 hours, when tested in accordance with the acute lethality test set out in section 14.1;

b) more than 50 percent of the three spine stickleback subjected to it for a period of 96 hours, when tested in accordance with the acute lethality test set out in section 14.2; or

c) more than 50 percent of the Daphnia magna subjected to it for a period of 48 hours, when tested in accordance with the acute lethality test set out in section 14.3. (*létalité aiguë*)

Guidance

Guidance Publications

Source	Document Title	Document Number
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015

10. EMERGENCY MANAGEMENT AND FIRE PROTECTION

Licence Condition 10.1

The licensee shall implement and maintain an emergency preparedness program.

Preamble

The "emergency management and fire protection" safety and control area covers emergency plans and emergency preparedness programs which exist for emergencies and for non-routine conditions. It also includes any results of exercise participation.

Licensees are required to continually maintain and enhance their emergency management programs.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Nuclear Emergency Preparedness and Response*	REGDOC-2.10.1

* Off-site reporting timelines accepted by CNSC staff for Saskatchewan uranium mine and mill sites are described in January 30, 2020 letter from Cameco to the CNSC (L. Mooney to H. Tadros, e-Doc 6109667).

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Emergency Preparedness and Response Program	6878854	Yes

The emergency management and fire protection program will be assessed against the following principles:

10.1.1 Potential emergency situations are identified.

10.1.2 Pre-incident plans for response to emergencies are developed and are maintained.

10.1.3 Resources, including facilities and equipment required to respond to emergencies are identified and maintained.

10.1.4 Emergency communication protocols are established and understood.

10.1.5 Organization and responsibilities are identified.

10.1.6 Workers are trained to fulfill duties and responsibilities with respect to emergency management and fire plans and procedures.

10.1.7 Procedures are implemented and maintained to prevent, prepare for, and respond to emergencies.

10.1.8 Response plans are periodically tested.

Guidance

There is no guidance provided for this licence condition.

Licence Condition 10.2

The licensee shall implement and maintain a fire protection program.

Preamble

Licensees are required to implement and maintain a fire protection program (a set of planned, coordinated, controlled and documented activities) to ensure that the licensed activities do not result in an 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.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
NRC	National Building Code of Canada (2015)*	N/A
NRC	National Fire Code of Canada (2015)*	N/A
CSA Group	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances*	N393-13

* Subject to exclusions and/or amendments, as contained in Saskatchewan's Codes Adoption 2015.
** To be implemented by Cameco by December 31, 2023 and to be used as guidance until the implementation date

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Fire Protection Program	6936525	Yes

Guidance

There is no guidance provided for this licence condition.

11. WASTE MANAGEMENT

Licence Condition 11.1

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 facility's operations up to the point where the waste is removed from the facility to a separate waste management facility.

Waste management facilities at the Rabbit Lake Operation include:

- storage areas for mineralized 'special' waste rock and low-grade ore
- clean waste rock and overburden piles
- in-pit Tailings Management Facility and inactive Above-Ground Tailings Management Facility
- contaminated industrial waste storage
- storage and recycling facilities for hazardous wastes
- landfill for uncontaminated industrial and domestic waste
- domestic sewage treatment

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CNSC	Waste Management, Volume I: Management of Radioactive Waste	REGDOC-2.11.1
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings*	REGDOC-2.11.1

* Applicable to new uranium mine or mill projects and/or to new waste management facilities at existing uranium mines and mills.

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Waste Management Program	6878858	Yes

The waste management program will be assessed against the following principles:

11.1.1 A radioactive waste management program is implemented to control and minimize the volume of radioactive waste.

11.1.2 The volume of waste is minimized by applying the waste hierarchy.

11.1.3 Work is carried out in a manner that minimizes waste and prevents pollution.

11.1.4 Waste is stored or disposed of in the appropriate manner.

11.1.5 Wastes are managed in a manner that does not compromise reclamation or decommissioning plans.

11.1.6 The effectiveness of waste management practices is monitored, measured and recorded on a regular basis.

11.1.7 Routine inspections are performed to identify any potential waste management issues and to verify the condition of containment structures and waste management facilities.

11.1.8 The safety of embankments/dams is inspected and evaluated.

11.1.9 Records are kept of the quantities and types of waste generated and the method of disposal or management.

11.1.10 Wastes are managed to control the present and future releases of contaminants to the environment.

11.1.11 Surface water is managed to prevent or minimize the volume that is contaminated.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Waste Management, Volume III: Safety Case for the Disposal of Radioactive Waste, Version 2	REGDOC-2.11.1
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A

Licence Condition 11.2

The licensee shall maintain a decommissioning plan.

Preamble

This LC requires that the licensee maintain a preliminary decommissioning plan (PDP).

A PDP provides an overview of the proposed decommissioning approach that is sufficiently detailed to assure that the proposed approach is, in the light of existing knowledge, technically and financially feasible, and appropriate in the interests of health, safety, security and the protection of the environment. The PDP defines areas to be decommissioned and the general structure and sequence of the principal work packages. The PDP forms the basis for establishing and maintaining a financial arrangement (financial guarantee) that will assure adequate funding of the decommissioning plan.

Compliance Verification Criteria

Licensing Basis Publications

Source	Document Title	Document Number
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294-09
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294-19
CNSC	Decommissioning	REDOC-2.11.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Preliminary Decommissioning Plan	6311196	Yes
Cameco	Preliminary Decommissioning Cost Estimate	6312122	Yes

The PDP is to be revised at a minimum every 5 years or when required by the Commission; however, is to be kept current to reflect any changes in the site or nuclear facility. The Rabbit Lake Operation PDP was last revised and submitted to the CNSC in June 2020. Cameco submitted an updated PDP to the CNSC in December 2022. This updated PDP is undergoing review against the current version of the CSA Group standard.

WASTE MANAGEMENT

Guidance

There is no guidance provided for this licence condition.

12. SECURITY

Licence Condition 12.1

The licensee shall implement and maintain a security program.

Preamble

The "security" safety and control area 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.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Security Program	6956542	Yes

The security program will be assessed against the following principles:

12.1.1 The security program addresses the risks identified in an industrial security threat and risk assessment.

12.1.2 Measures are implemented and maintained to prevent the loss of nuclear substances or prevent acts of sabotage at the facility.

12.1.3 Measures are taken to prevent unauthorized access to the mining facility and to areas within the facility where nuclear substances are stored.

12.1.4 The industrial security threat and risk assessment is periodically reviewed and updated.

Guidance

Guidance Publications

Source	Document Title	Document Number
CNSC	Security of Nuclear Substances: Sealed Sources and Category I, II and III Nuclear Material, Version 2.1	REGDOC-2.12.3

13. SAFEGUARDS AND NON-PROLIFERATION

Licence Condition 13.1

The licensee shall implement and maintain a safeguards program.

Preamble

The "safeguards and non-proliferation" safety and control area 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 *Treaty on the Non-Proliferation of Nuclear Weapons*.

Compliance Verification Criteria

Source	Document Title	Document Number
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Security Program	6956542	Yes

The safeguards and non-proliferation program will be assessed against CNSC's REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy,* and the following principles:

13.1.1 Reasonable services and assistance are provided to the IAEA to enable the IAEA to carry out its duties and functions.

13.1.2 Prompt access to all locations at the facility is granted to the IAEA at all reasonable times where such access is required for the purposes of carrying on an activity pursuant to a safeguards agreement. Health and safety services and escorts are provided as required in order to facilitate activities.

13.1.3 Records that must be kept or any reports that are required to be made under a safeguards agreement are disclosed to the CNSC and the IAEA.

13.1.4 Reasonable assistance is provided to the IAEA to enable sampling and removal or shipment of samples.

13.1.5 Reasonable assistance is provided to the IAEA to enable measurements, tests and removal or shipment of equipment.

13.1.6 Measures are implemented to prevent damage to, or the theft, loss or sabotage of samples collected pursuant to a safeguards agreement or the illegal use, possession or removal of such samples.

13.1.7 Reports and information, that is required to facilitate Canada's compliance with any applicable safeguards agreement, is provided to the Commission.

Guidance

There is no guidance provided for this licence condition.

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14. PACKAGING AND TRANSPORT

Licence Condition 14.1

The licensee shall implement and maintain a packaging and transport program.

Preamble

The "packaging and transport" safety and control area covers the safe packaging and transport of nuclear substances and radiation devices to and from the licensed facility.

Every person who transports radioactive material, or requires it to be transported, shall act in accordance with the requirements of Transport Canada's *Transportation of Dangerous Goods Regulations* and the *Packaging and the Transport of Nuclear Substances Regulations, 2015*.

The *Packaging and Transport of Nuclear Substances Regulations, 2015* and the *Transportation of Dangerous Goods Regulations* provides 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

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Transportation Program	6782958	Yes

The licensee shall implement and maintain a packaging and transport program that will ensure compliance with the requirements set out in the *Transportation of Dangerous Goods Regulations* and in the *Packaging and Transport of Nuclear Substances Regulations, 2015.*

Guidance

There is no guidance provided for this licence condition.

15. FACILITY SPECIFIC

Licence Condition 15.1

The licensee shall submit a commissioning report to the Commission, or a person authorized by the Commission, in the event of a return to operations.

Preamble

There is no preamble provided for this licence condition.

Compliance Verification Criteria

Licensee Documents that Require Notification of Change

Source	Document Title	CNSC e-Access Document Number	Prior Notification Required
Cameco	Mining Facility Licensing Manual	6941575	Yes
Cameco	Public Information Program	6782956	Yes
Cameco	Eagle Point Mine Program	6936517	Yes
Cameco	Mill Operations Program	6793534	Yes

The Commission, or a person authorized by the Commission, will confirm that an acceptable commissioning report has been submitted prior to authorizing Cameco to return to operations from being in a care and maintenance state. Upon review and acceptance of the commissioning report, a person authorized by the Commission (as listed in delegation of authority in Part I, Introduction), will provide formal notification that Cameco is authorized to return to operations if the following licence conditions are met:

At least 6 months prior to the planned restart of operations at either the Rabbit Lake mine or the Rabbit Lake mill, Cameco shall supply:

15.1.1 A complete description and schedule for proposed commissioning and evaluation activities, including but not limited to integrity of equipment, and structures etc.

15.1.2 Demonstration that there are sufficient numbers of qualified staff present for all safety-significant roles, including current training records for all operational staff as well training records of on-boarding of new staff.

15.1.3 Demonstration of measures to ensure conventional health and safety, radiation protection and environmental protection, during commissioning and once production has resumed.

15.1.4 The community engagement plan associated with restart to ensure the sufficient engagement of indigenous nations and communities as well as interested stakeholders.

Guidance

There is no guidance provided for this licence condition.

APPENDIX A CHANGE CONTROL PROCESS

A.1 Change Control Process

A change control process is applied to the LCH to ensure that:

- preparation and use of the LCH are properly controlled
- all referenced documents are correctly identified and maintained
- procedures for modifying the LCH are followed.

A request to change this LCH can be initiated by either CNSC staff or the licensee. The licensee will be consulted on any changes to the LCH that are proposed by CNSC staff.

CNSC staff will take the following steps to update the LCH:

1. the CNSC receives or initiates written notification of proposed change
2. initiate a change request using the Change Request Form
3. complete a technical review of the proposed change, if required
4. consult the licensee and in case of disagreement on the proposed change, the dispute resolution process outlined in section A.3 will apply
5. obtain consent and signature from a Delegated Officer
6. update the LCH in accordance with the Change Request Form and send the updated document to the parties identified on the distribution list (section A.5).

Change Request Form

1. GENERAL INFORMATION			
File Plan #		**e-Doc #(s) for Change Request Form**	
Licensee	**Licence Number**	**LCH #, Rev/Version**	**Request Date**
Licensing Officer			

2. CHANGE(S) TO THE LCH			
#	**Description and Purpose**	**Proposed Change**	**References**
1	<initiator, nature, reason for change, e.g. administrative, change to a licensee doc, etc.>	<identify modifications, such as by track changes, highlighting, etc.>	<LC, page, section #, etc.>
2			

3. ASSESSMENT (text and/or e-Doc #s)			
#	**Division/Org**	**Comment**	**Disposition**
1	<division>		
	<division>		
	<licensee>		
	<division>		
2	etc.		

4. CONSENT TO MODIFY		
#	**Agreed**	**Comment**
1		
2		

Name	**Title**	**Signature**	**Date**

5. LCH DOCUMENTATION AND DISTRIBUTION			
New LCH Number	**LCH Effective Date**	**e-Doc #** (include version number)	
CNSC Outgoing Notification		**e-Doc #**	**Date Sent**

APPENDIX A

A.2 Review Criteria for Proposed Changes to Licensing Basis Documents

The licensee must provide the CNSC with written notification of a proposed significant change to key licensee documents before the licensee implements the change. The notification must be accompanied by sufficient information to demonstrate that the change is within the intent of the licensing basis. Written notification of minor or administrative changes may be made in batches after the changes have been implemented.

The following criteria will be used by CNSC staff to determine if the proposed change is acceptable:

1. The submission includes the appropriate level and quality of information with regards to:
   a) The description of the proposed change including:
      - a summary of the change, including the purpose or need for the change
      - a preliminary finding of whether this proposal or notification is required under the NSCA, a regulation made under the Act or the licence, or has implications under the *Impact Assessment Act*, or whether a licence amendment or other licensing action would likely be required
      - where applicable, the alternatives evaluated and the reasons for selection of the chosen option
      - any changes to the inventories of nuclear substances on site related to the proposed change
      - the construction, commissioning and operating schedule for the proposed change including hold points or progress reports for regulatory review and approval (as appropriate)
      - expected impacts, if any, on the proposed decommissioning or closure plans
      - results of any risk analysis or hazard operability studies performed, and a summary of the identified hazards and the mitigation measures identified to control potential hazards
   b) The description of the design control, operating specifications and criteria including:
      - the design basis and criteria, and performance specifications
      - the design drawings such as the general arrangement, process and instrumentation diagrams, and process flow sheets
      - the quality management program for the various key stages of the change (e.g., design, construction, commissioning, etc.)

c) The assessment of both the short and long term impacts with the mitigation measures in place on:
   - worker's health and safety, including potential radiological and non-radiological exposures
   - the environment
   - security
   - Canada's international obligations

d) The planned administrative controls including:
   - changes to the organization, roles and responsibilities
   - changes to applicable programs and procedures
   - a description of the proposed monitoring, inspection and test plans, including locations and frequency proposed to evaluate both positive and negative results

e) Changes to contingency plans including "full-stop measures"

f) Evidence that the licensee's internal reviews and approvals have been completed, including meeting the requirements of the licensee's change management procedure and consultation with the onsite occupational health and environmental committees, where applicable

g) Identification of the documents and training programs that may require revision when the proposed change is implemented

2. The effects of the proposed change or action remain within the licensing basis.
3. Following the implementation of the change the licensee will remain in compliance with the requirements set out in the applicable acts, regulations, and LCs.

A.3 Dispute Resolution

In case of a dispute between the licensee and CNSC staff regarding changes to the LCH, both parties will meet to discuss the dispute and reach a decision on the path forward. The decision, including its rationale will be documented. If any party is not satisfied with the decision, the resolution process will proceed up to the Director, Director General or Executive Vice-President and Chief Regulatory Operations Officer level. If any party is still not satisfied with the decision, the issue will be brought to the attention of the Commission at a Commission meeting. The decision made by the Commission will be final.

A.4 Records Management

In order to track changes to the LCH, the document change request and accompanying documentation will be archived in records and referenced in the revision history of the LCH. Electronic communication related to the change, such as comments from reviewers will be stored in the CNSC information management system.

APPENDIX A

A.5 Distribution

A copy of the updated version of the LCH will be distributed to the following parties:

- Uranium Mines and Mills Division, CNSC
- Cameco Corporation

A.6 Reporting to the Commission

CNSC staff will report on the changes made to the LCH during the previous year in their annual report to the Commission.

APPENDIX B LICENSEE DOCUMENTS THAT REQUIRE NOTIFICATION OF CHANGE

Document Title	e-Doc
Eagle Point Mine Program	6936517
Emergency Preparedness and Response Program	6878854
Environmental Protection Program	687854
Fire Protection Program	6936525
Maintenance Program	6830250
Mill Operations Program	6793534
Mining Facility Licensing Manual	6941575
Occupational Health and Safety Program	6936505
Preliminary Decommissioning Cost Estimate	6312122
Preliminary Decommissioning Plan	6311196
Public Information Program	6782956
Quality Management Program	6696194
Radiation Protection Program	6941559
Security Program	6956542
Transportation Program	6782958
Training and Development Program	6936509
Waste Management Program	6878858
Financial Instruments	6763599 6763605 6763609
Environmental Code of Practice (Appendix A of the Environmental Protection Program – Code of Practice)	6615434
Radiation Code of Practice (Appendix C of Radiation Protection Program – Code of Practice)	6615433
Environmental Performance Report, 2020	6451233
Environmental Risk Assessment, 2020	6451247

APPENDIX C LIST OF DOCUMENTS USED AS GUIDANCE OR COMPLIANCE VERIFICATION CRITERIA

Document	Document Title	Document Number
Canadian Dam Association	Canadian Dam Association, Canadian Dam Safety Guidelines	N/A
CNSC	Preparing Codes of Practice to Control Radiation Doses at Uranium Mines and Mills	G-218
CNSC	Management System	REGDOC-2.1.1
CNSC	Human Factors	REGDOC-2.2.1
CNSC	General Design Considerations: Human Factors	REGDOC-2.5.1
CNSC	Environmental Protection: Environmental Principles, Assessments and Protection Measures, Version 1.2	REGDOC-2.9.1
CNSC	Personnel Training, Version 2	REGDOC-2.2.2
CNSC	Nuclear Emergency Preparedness and Response, Version 2	REGDOC-2.10.1
CNSC	Safeguards and Nuclear Material Accountancy	REGDOC-2.13.1
CNSC	Public Information and Disclosure	REGDOC-3.2.1
CNSC	Licence Application Guide Nuclear Substances and Radiation Devices	REGDOC-1.6.1
CNSC	Safety Culture	REGDOC-2.1.2
CNSC	Design of Uranium Mines and Mills: Ventilation Systems	REGDOC-2.5.4
CNSC	Conventional Health and Safety	REGDOC-2.8.1
CNSC	Waste Management, Volume II: Management of Uranium Mine Waste Rock and Mill Tailings	REGDOC-2.11.1
CNSC	Security of Nuclear Substances: Sealed Sources and Category 1, II and II Nuclear Material, Version 2.1	REGDOC-2.12.3
CNSC	Reporting Requirements, Volume I: Non-Power Reactor Class I Nuclear Facilities and Uranium Mines and Mills	REGDOC-3.1.2
CNSC	Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities	REGDOC-3.3.1
CNSC	Regulatory Fundamentals	REGDOC-3.5.3

Document	Document Title	Document Number
CNSC/SK	CNSC – Saskatchewan Harmonized Annual Reporting Requirements, August 2010	e-Doc 3678482
CSA Group	Management System Requirements for Nuclear Facilities	N286-12
CSA Group	Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.4-10
CSA Group	Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.5-11
CSA Group	Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills	N288.6-12
CSA Group	Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills	N288.7-15
CSA Group	Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities	N288.8-17
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294-09
CSA Group	Decommissioning of Facilities Containing Nuclear Substances	N294-19
CSA Group	Environmental Management Systems – Requirements with Guidance for Use	ISO 14001:2015
NRC	National Building Code of Canada (2015)	N/A
NRC	National Fire Code of Canada (2015)	N/A
CSA Group	Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances	N393-13

Note: For CNSC documents, the most recent version of a referenced document shall be implemented following review and agreement between Cameco and the Canadian Nuclear Safety Commission.

APPENDIX C