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Written submission from Cameco Corporation

Mémoire de Cameco Corporation

In the Matter of the

À l'égard de

Cameco Corporation, Rabbit Lake Operation

Cameco Corporation, établissement de Rabbit Lake

Application for the renewal of uranium mine/mill licence for McArthur River Operation and Key Lake Operation

Demande visant le renouvellement du permis d'exploitation de mine et d'usine de concentration d'uranium pour l'établissement de Rabbit Lake

Commission Public Hearing

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Executive Summary

Cameco Corporation (Cameco) is seeking renewal of the Canadian Nuclear Safety Commission (CNSC) licence for the Rabbit Lake Operation (Rabbit Lake) for a 20-year term. The current licence (UML-MINEMILL-RABBIT.01/2023) was renewed in 2013 for a 10-year term and is valid until October 31, 2023. This Commission Member Document provides a high-level summary of the licensing basis and supports Cameco's request for a renewal of the Rabbit Lake CNSC licence.

Since 1975, Rabbit Lake has produced more than 78 million kilograms of uranium (kg U) from five different orebodies. From 1993 to 2016, Rabbit Lake produced uranium ore concentrate primarily from milling of the Eagle Point orebody. However, as a result of depressed uranium market conditions, during the licence term, production was suspended in 2016 and Cameco placed Rabbit Lake into a safe state of care and maintenance.

Cameco is focused on taking advantage of the long-term growth in the industry, while maintaining the ability to respond to market conditions as they evolve. A decision towards a resumption of production at Rabbit Lake is not expected until market conditions improve, and the site is currently being maintained in a safe state of care and maintenance. During care and maintenance, Rabbit Lake will continue to focus on key functions of the site in order to maintain the flexibility to conduct current and future activities in line with those authorized under the current licence. These functions include:

- Maintaining the safety of the public, workers and protection of the environment.
- Collecting and treating potentially contaminated water.
- Ensuring commitments to our stakeholders are met (ensuring regulatory compliance and maintaining ongoing relationships with our target communities).
- Continued maintenance of critical infrastructure.

During the current licence term, Rabbit Lake achieved strong performance, protecting the health and safety of people and the environment and achieving continual improvement in facilities and management systems. Highlights include the following:

- Improvement in the quality of all water treated and released to the environment during the current care and maintenance period.
- Low effective doses received by workers.
- Continual improvement in key safety metrics, with 2021 representing the lowest total recordable injury rate (TRIR) over the licence term.
- Successful activation of our Corporate Crisis Management Plan during the COVID-19 pandemic, including implementation of a number of proactive measures to ensure a safe working environment for all our workers.
- Ongoing progressive reclamation activities in areas of the site no longer required for future mining or milling activities.

Cameco continues to engage with the public as described in the Rabbit Lake *Public Information Program*. As part of this effort, there has been ongoing engagement with the rights-bearing Indigenous communities of the Athabasca Basin located in the vicinity of Rabbit Lake in accordance with Cameco's Collaboration Agreements. Three First Nations and four municipalities have been identified as the primary audience with interest in activities at Rabbit Lake. Additional engagement is also focussed on local Métis people, Cameco employees and long-term contractors, as well as the general public of the Northern Administrative District of Saskatchewan. In support of the *Public Information Programs* in place at all Cameco's Saskatchewan operations, Cameco maintains a Public Disclosure Protocol that was developed in accordance with guidance provided by the CNSC. The Public Disclosure Protocol describes the types of routine and non-routine information that Cameco is committed to providing to target audiences.

With a focus on building and maintaining support from local communities, Cameco's goal is to provide benefits from resource development – more specifically, workforce and business development opportunities, community investment initiatives, community engagement and environmental stewardship activities, which are all considered pillars of Cameco's northern strategy.

A longer-term licence that Cameco has applied for would provide Cameco with an increased level of regulatory certainty and predictability while continuing to protect the health and safety of the public, workers and the environment, as well as facilitate our ability to make longer term plans and budgeting decisions for investment at our operations. The increased level of regulatory certainty provided to Cameco by a longer-term licence would, in turn, benefit the communities through our ability to sustain our commitments into the future.

During the current licence term, Rabbit Lake has demonstrated strong performance through continuous improvement in our processes. Based on this performance, we have demonstrated that we are qualified to carry out all licensed activities for the proposed 20-year licence term at Rabbit Lake and will, in doing so, continue to make the necessary provisions for protecting the health and safety of our workers, the public and the environment.

1.0 Introduction

1.1 Background

1.1.1 Location

The Cameco Corporation (Cameco) Rabbit Lake Operation (Rabbit Lake) is a uranium mining and milling facility in the Athabasca Basin of northern Saskatchewan. Cameco respectfully acknowledges that Rabbit Lake is located on Treaty 10 Territory, the traditional territory of the Cree and Dene Peoples and the homeland of the Métis. It is located approximately 700 km north of Saskatoon to the west of Wollaston Lake (Figure 1.1-1). The Hatchet Lake Denesųłiné First Nation and the adjoining Northern Hamlet of Wollaston Lake are the closest permanent communities to Rabbit Lake. These communities are located approximately 30 km southeast of Rabbit Lake, by air, along the southeast shore of Wollaston Lake. Rabbit Lake is accessible by vehicle via Saskatchewan public Highway 905, which is maintained year-round.

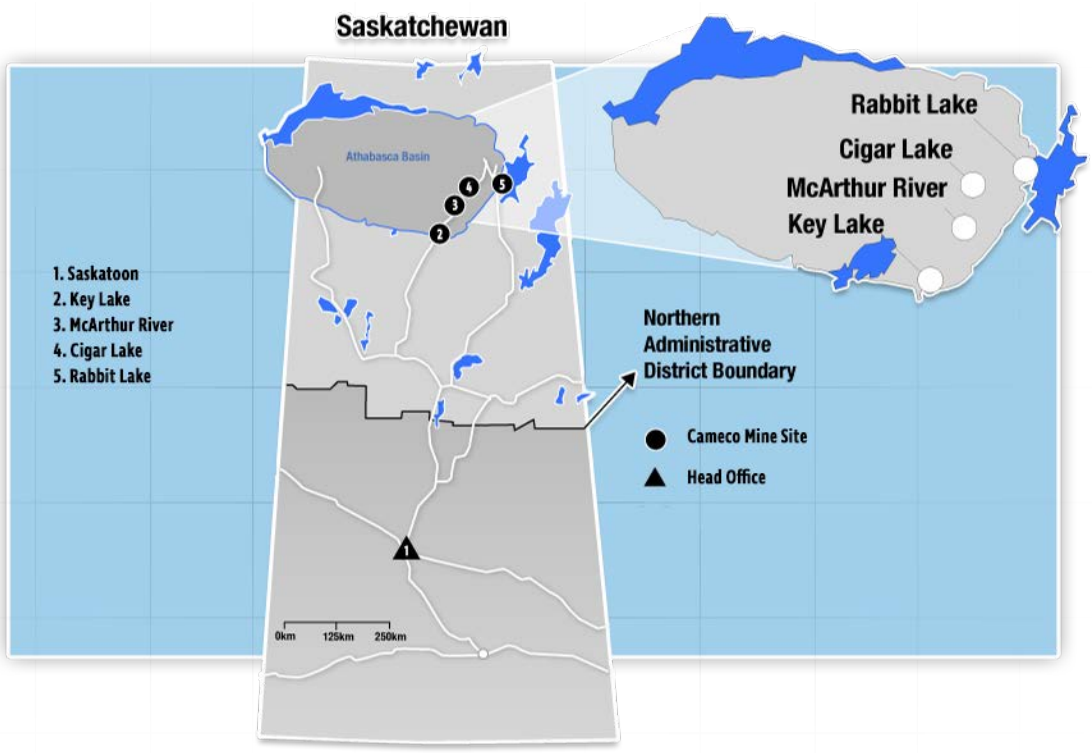


Figure 1.1-1: Rabbit Lake Operation location.

Rabbit Lake is 100% owned and operated by Cameco, and the Rabbit Lake mill is the second-largest uranium mill in the world. Since 1993, the primary source of ore for the mill when in production has been the Eagle Point mine, located approximately 12 km to the northeast of the mill, within the boundaries of the overall Rabbit Lake surface lease.

1.1.2 History

1.1.2.1 Mining and Milling

Rabbit Lake is Canada's longest-operating uranium mine and mill, with the first uranium processed in 1975. The operation was brought into production by Gulf Minerals Canada Limited and Uranerz Canada Limited. Eldorado Resources Limited acquired the operation in 1982. Cameco Corporation was created from the merger of Eldorado and Saskatchewan Mining Development Corporation in 1988, at which time the Rabbit Lake assets were transferred to Cameco.

The Rabbit Lake orebody was the first orebody processed at the Rabbit Lake mill complex (Figure 1.1-2). Stripping of the open pit for mining of the Rabbit Lake orebody began in 1974, with the ore milled from 1975 until 1984. Tailings generated during the milling of the Rabbit Lake orebody were disposed of in the Above Ground Tailings Management Facility (AGTMF) located 3 km south of the mill. During the milling of the Rabbit Lake orebody, exploration continued in the area. Additional orebodies were identified to the northeast of the Rabbit Lake mill along the north shore of the Harrison Peninsula; primarily the B-Zone, D-Zone, A-Zone and Eagle Point orebodies.

Figure 1.1-2: Rabbit Lake mill complex.

Stockpiled ore from the Rabbit Lake orebody sustained mill production until mining of the B-Zone orebody made this ore source available. Once the Rabbit Lake orebody was mined out, the open-pit was converted to an engineered tailings management facility,

referred to as the Rabbit Lake In-pit Tailings Management Facility (RLITMF), and tailings deposition the AGTMF was suspended. Similar to the original Rabbit Lake orebody, the B-Zone orebody was mined as an open pit. Given the proximity of the B-Zone orebody to Collins Bay, a cofferdam was installed to access the orebody. B-Zone cofferdam construction was completed in mid-1984, with first ore extracted and fed to the mill in November 1985.

Market conditions resulted in a temporary shutdown of the Rabbit Lake mill in June 1989. Mining of B-Zone continued during this period, with the remaining ore stockpiled until August 1991 when mill operations resumed. The D-Zone and A-Zone deposits were subsequently mined utilizing the same mining techniques applied at B-Zone, with mining completed in 1996 and 1997 respectively.

Mining of the Eagle Point orebody started in 1993. In March 1999, market conditions resulted in the mine being placed into a safe state of care and maintenance. Milling was temporarily suspended in June 2001 when stockpiled ore was depleted. The mill resumed operation the next year when improved market conditions led to the restart of mining at Eagle Point. Mining at Eagle Point (Figure 1.1-3) continued until 2016 when, once again, market conditions led Cameco to make the decision to place the mine and mill in a safe state of care and maintenance that continues to present day.

Figure 1.1-3: Rabbit Lake Eagle Point mine area.

1.1.2.2 Tailings Management

The Rabbit Lake AGTMF was constructed for the containment of tailings from the mining of the original Rabbit Lake orebody. The AGTMF covers an area of approximately 53 ha at the tailings surface with an overall footprint approximately 1,300 m long by 600 m wide. The AGTMF is a purpose-built facility that is confined by earth-filled dams at the north and south ends and natural bedrock ridges along the east and west sides of the facility. The fundamental design objectives of the AGTMF are to achieve safe, permanent storage of tailings and to ensure the stability of the dams. A key design component of the AGTMF is internal drainage features that act to reduce the porewater pressure, which provides overall stability of the north and south dams.

The AGTMF contains approximately 6.5 million tonnes of tailings that were deposited between 1975 and 1985. No tailings have been deposited within the AGTMF since 1985. The AGTMF has been divided into two catchment areas. The southern catchment is inactive and was covered with a 1 metre till cover and revegetated from 2012 to 2015 (Figure 1.1-4). The north catchment remains active, being utilized for disposal of contaminated waste generated from mining and milling activities at Rabbit Lake and the nearby Cameco Cigar Lake Operation.

Figure 1.1-4: Rabbit Lake Above Ground Tailings Management Facility.

The RLITMF is the active facility for tailings placement at Rabbit Lake (Figure 1.1-5). As described above, the RLITMF was constructed within the open pit created through mining of the Rabbit Lake orebody, with placement of tailings commencing in 1985. The RLITMF is designed and operated with a highly permeable zone of crushed rock and

filter sand surrounding the tailings (pervious surround), which acts a means to drain and collect filtered water from the tailings. The pervious surround promotes tailings consolidation and ensures hydraulic containment of the tailings supernatant water from the surrounding groundwater. The water from the pervious surround drains via a lateral drift to a vertical borehole (raise well) where it is pumped to the Rabbit Lake mill for treatment prior to release to the environment.

Figure 1.1-5: Rabbit Lake In-Pit Tailings Management Facility (RLITMF).

1.1.2.3 Progressive Reclamation

Throughout the nearly 50-year life of the facility, Rabbit Lake has completed progressive reclamation of a number of areas that are no longer required for future mining or milling activities. This includes former open-pit mines (B-Zone, A-Zone and D-Zone) and their associated waste rock piles (WRPs).

Reclamation completed in relation to the historic mining of Rabbit Lake orebody includes the North and East #5 WRPs that were generated from materials (overburden and waste rock) from mining of the Rabbit Lake open pit. The North WRP, consisting primarily of glacial till, lake organics, sandstone and basement rock, was contoured and revegetated in 1981. The associated East #5 WRP was consumed as construction material for the RLITMF pervious surround as well as for construction of the B-Zone haul road. The base area of this pile was contoured and revegetated in 2001.

Progressive reclamation of the former D-Zone and A-Zone mining areas has also been completed. Following mining, backfilling operations were conducted with special waste rock and other material placed at the bottom of the open pits prior to being capped with sand/till and lake bottom sediments and the pits were flooded with water from Collins Bay. Years of subsequent monitoring were then conducted and confirmed pit water quality was acceptable for removal of the cofferdams and abutments, allowing these ponds to be reconnected to Collins Bay. The cofferdams from A-Zone and D-Zone were removed in 2006 and 2010 respectively. The remaining clean waste rock piles at A-Zone and D-Zone have also been contoured and revegetated and are considered fully reclaimed.

Similar to A-Zone and D-Zone, the former B-Zone open-pit mine was flooded with water from Collins Bay following completion of mining. The water qualify of B-Zone Pond continues to be monitored in preparation for future reclamation. From 2011 to 2013, Cameco reclaimed the B-Zone WRP, located approximately 500 m to the southeast of the former B-Zone open pit through application of a permanent engineered cover system. Monitoring is ongoing to evaluate performance of the various reclamation activities completed to date (Figure 1.1-6).

Figure 1.1-6: Reclaimed B-Zone Waste Rock Pile.

1.1.3 Activities During the Current Licence Term

CNSC licence UMOL-MINEMILL-RABBIT.00/2023 was issued in October 2013. and was amended to UML-MINEMILL-RABBIT.01/2023 on March 9, 2021, to reflect

approval of a revised Rabbit Lake financial guarantee and modernization of licence conditions.

As a result of uranium market conditions during the licence term, production was suspended in 2016 and Cameco placed Rabbit Lake into a safe state of care and maintenance. From 2013 to 2016, Rabbit Lake produced uranium concentrate primarily from milling of Eagle Point ore. Production during this period remained below the licensed annual production limit of 4.25 million kilograms uranium (kg U). During this production period, Rabbit Lake made various improvements to mine and mill processes. Notable activities during this period included:

- Implementation of a water cover on the RLITMF in order to prevent further development of ice lenses during tailings placement.
- Modifications to the effluent treatment (ET) area in order to improve the efficiency of the Rabbit Lake water treatment process. Implementation of efficiencies in the ET area were possible due to significant upgrades to the Rabbit Lake mill water treatment process completed in 2009:
    - Installation of a large diameter culvert between ET Ponds #1 and 2 to bypass barium chloride addition in the ET Building. The pumps and barium chloride tank remain in place in the event of an upset condition requiring additional treatment.
    - Completion of a successful trial program demonstrating that no substantial change in total suspended solids (TSS) concentrations were observed in treated water when the effluent polishing sand filters were bypassed. A permanent bypass system was installed; however, the sand filters remain in place in the event of an upset condition requiring additional TSS control.
- Replacement of the Upper Links Lake culvert with an open drainage channel.

Also, during the current licence term, Rabbit Lake continued to conduct progressive reclamation activities related to inactive areas of the site. This included:

- Ongoing revegetation and performance monitoring of the engineered cover system on the B-Zone WRP.
- Completed placement of a cover layer and hydroseeding on the inactive southern portion of the AGTMF.
- Ongoing revegetation of reclaimed mining areas at A-Zone, D-Zone and B-Zone, which included planting of approximately 28,000 native trees and shrubs.
- Decommissioning of obsolete mobile equipment and unused fuel storage facilities.

1.2 Summary of Application

Cameco submitted the current application to the CNSC Commission Secretariat on April 20, 2021, requesting the Rabbit Lake licence be renewed prior to its current expiry date of October 31, 2023.

The licensing basis for Rabbit Lake is primarily established from the following:

- The regulatory requirements set out in the applicable laws and legislation.
- The conditions and safety and control measures described in the CNSC licence, licence conditions handbook (LCH) and the documents directly referenced in those documents:
  - The Rabbit Lake *Mining Facility Licensing Manual* (RAM-MFLM).
  - Rabbit Lake program documents and codes of practice.
  - Approved environmental impact statements (EIS).
  - Current environmental risk assessment (ERA).

Cameco provided the RAM-MFLM and supporting program level documents to CNSC staff for their review and acceptance in support of this application to the Commission.

1.2.1 Licence Term

Within the April 20, 2021, licence renewal request, Cameco requested the current licence be renewed for an indefinite term. An indefinite licence term would last until Cameco has made the decision to commence final decommissioning of Rabbit Lake. In support of this decision, Cameco would prepare a detailed decommissioning plan for approval by the CNSC, as well as conduct engagement activities related to the plan.

Cameco is an experienced operator in northern Saskatchewan with over 35 years of operations in mining and milling of uranium ore in the Athabasca Basin. Rabbit Lake has demonstrated strong health and safety measures, radiation protection and environmental performance throughout the current licence term with a commitment to continuous improvement in all of these areas. As an experienced operator, Cameco has mature management systems in place to ensure continued safety of workers and the public, as well as protection of the environment. Specifically, Rabbit Lake has well established programs in all CNSC Safety and Control Areas that not only have been reviewed and approved by the CNSC, but also rated as ‘Satisfactory’ in performance throughout the licence term. A longer-term licence is expected to provide Cameco with an increased level of regulatory certainty and predictability while continuing to protect the health and safety of the public, workers and the environment, as well as facilitate our ability to make longer term plans and budgeting decisions for investment at our operations.

Cameco has developed long-standing relationships with northern Indigenous communities. With a focus on building and maintaining support from local communities, Cameco’s goal is to provide benefits from resource development – namely, workforce and business development opportunities, community investment initiatives, community engagement and environmental stewardship activities, which are considered pillars of our northern strategy. The increased level of regulatory certainty provided to Cameco by a longer-term licence would, in turn, benefit the communities through our ability to continue to sustain these commitments into the future.

In support of the licence renewal process, Cameco has continued to emphasize early and proactive engagement with Indigenous communities located in the vicinity of Rabbit Lake in accordance with Cameco's Collaboration Agreements. Community engagement at Rabbit Lake is carried out in accordance with the Rabbit Lake *Public Information Program* (RAM-PIP). During our engagement activities, communities expressed uncertainty with what an indefinite licence term means and how it fits within existing regulatory and engagement frameworks.

In response to these concerns, Cameco submitted a revised application requesting a 20-year licence term on November 4, 2022. Although Cameco remains confident that the management systems we have in place to ensure that the health and safety of workers, the public and the environment will remain protected throughout an indefinite licence term, it is important to understand and respond to the questions and concerns of the Indigenous communities in close proximity to our facilities, which is reflected in the revised request for a 20-year licence term.

2.0 Business Plan

2.1 General

Cameco's vision – "Energizing a clean-air world" – recognizes that we have an important role to play in enabling the vast reductions in global greenhouse gas emissions required to achieve a resilient net-zero carbon economy. We are invested across the nuclear fuel cycle. Our uranium and fuel services products are used around the world in the generation of safe, carbon-free, affordable, base-load nuclear energy.

Further, in December 2022, Canada finalized its Critical Minerals Strategy that included 31 minerals considered essential to Canada's economic security and which supply is threatened; required for our national transition to a low-carbon economy; or a sustainable source of highly strategic critical minerals for our partners and allies. Uranium is included as one of the 31 identified critical minerals. These critical minerals present a generational opportunity for Canada in many areas, including exploration, extraction, processing, downstream product manufacturing and recycling. The Critical Minerals List was developed in consultation with provincial, territorial, and industry experts and provides greater certainty to investors, developers, communities, and trading partners on national priorities. Further, the mining sector is the second-largest private sector employer of Indigenous Peoples in Canada. Our industry provides skills and employment training, contracting opportunities, job guarantees and community investments.

At the end of 2021, the Eagle Point mine has an estimated remaining indicated resources of 14.8 million kg U (38.6 million lbs U_3O_8) and inferred resources of 13.0 million kg U (33.7 million lbs U_3O_8). As a company, Cameco is focused on taking advantage of the long-term growth we see coming in our industry, while maintaining the ability to respond to market conditions as they evolve. We expect our strategy will allow us to increase long-term value, and we will execute it with an emphasis on safety, people and the environment. Our strategy is to capture full-cycle value by:

- Remaining disciplined in our contracting activity, building a balanced portfolio in accordance with our contracting framework.
- Profitably producing from our tier-one assets and aligning our production decisions in all segments of our business with our contract portfolio and customer needs.
- Being financially disciplined to allow us to execute on our strategy, take advantage of strategic opportunities and to self-manage risk.
- Exploring other emerging and non-traditional opportunities within the fuel cycle, which align with our commitment to responsibly and sustainably manage our business, contribute to the mitigation of global climate change, and help to provide energy security and solutions.

In the interim, Cameco's plan is to maintain our tier-two assets, including Rabbit Lake, in a safe state of care and maintenance. With this in mind, a decision to resume production at Rabbit Lake would not be expected until market conditions improve. During care and

maintenance, Rabbit Lake will continue to focus on key functions of the site in order to maintain the flexibility to conduct current and future activities in line with those authorized under the current licence. These functions include:

- Maintaining the safety of the public, workers and protection of the environment.
- Ensuring commitments to our stakeholders are met (ensuring regulatory compliance and maintaining ongoing relationships with our target communities).
- Collecting and treating potentially contaminated water.
- Maintaining critical infrastructure.

3.0 Safety and Control Areas

3.1 General

Cameco recognizes safety and health of our personnel and the public, protection of the environment and quality of our processes as the highest corporate priorities. As such, we strive to be a leading performer through a strong safety culture and our commitment to the following principles set out in our corporate Safety, Health, Environment and Quality (SHEQ) Policy:

- Preventing injury, ill health and pollution.
- Fulfilling regulatory, contractual and corporate requirements as well as commitments to local communities (defined as compliance obligations).
- Keeping risks at levels as low as reasonably achievable, taking into account economic and societal factors (ALARA).
- Ensuring quality of processes, products and services.
- Continually improving our overall performance.

During the licence term, the CNSC did not note any concerns related to Safety and Control Areas (SCAs) at Rabbit Lake. All SCAs were rated as satisfactory in annual regulatory oversight reports prepared by CNSC staff.

Additionally, the CNSC conducted 41 inspections at Rabbit Lake (Table 3.1-1). In accordance with our corrective action process, all issues identified during inspections were entered into the Cameco Incident Reporting System (CIRS) and addressed to the satisfaction of the CNSC. Regulatory oversight continued during the COVID-19 pandemic in 2020 and 2021 with the use of remote inspections due to travel restrictions.

Table 3.1-1: CNSC inspections of SCAs.

	CNSC Inspections
2013	3
2014	6
2015	6
2016	6
2017	6
2018	4
2019	3
2020	1
2021	2
2022 (to end of Q3)	4

3.2 Management System

Cameco's corporate policies and programs provide guidance and direction for the site-based programs that support the RAM-MFLM. There are 14 programs and two codes of practice along with supporting procedures, work instructions and forms that together comprise the Rabbit Lake management system. The Rabbit Lake *Quality Management Program* (RAM-QMP) describes the overall site management system as part of the licensing basis. The program addresses the requirements of Cameco's SHEQ Policy as well as providing guidance to the management system aspects of the CNSC SCAs.

The RAM-QMP was built on the 'Plan-Do-Check-Act' model outlined in the International Standards Organization (ISO) management standards, including ISO 9001 and ISO 14001. This model is designed to ensure that processes are systematically identified, controlled and monitored and that those processes and the program, are continually improved.

Cameco regularly reviews and revises site program documents as required. Program documents require version control in accordance with the Rabbit Lake LCH and the RAM-QMP is reviewed annually for effectiveness through a management review process. Further, Cameco internal audits as well as regulatory audits and inspections are conducted on a regular basis to determine the effectiveness of the quality management system.

3.2.1 Discussion

3.2.1.1 Incident Management

Incidents occurring at Rabbit Lake are entered into CIRS and addressed through Cameco's nonconformance and corrective action process. Through CIRS, Rabbit Lake is able to share relevant incident trends and corrective action results with the rest of the company to provide use of experience and facilitate collective improvement.

Cameco's corrective action process has an incident severity rating system of 1 to 5, with 5 being the most serious. Table 3.2-1 provides a summary of CIRS reporting. During the current licence term, there were no Level 5 incidents at Rabbit Lake. The volume of events shown in Table 3.2-1 are indicative of a strong reporting culture at Rabbit Lake, while overall reporting since 2016 reflects the care and maintenance status of the operation.

Table 3.2-1: CIRS reporting.

	CIRS Events	**CIRS Event per FTE on Site**
2013	1338	1.80
2014	1365	2.04
2015	1504	2.47
2016	851	2.25
2017	483	4.98
2018	379	3.81
2019	295	3.09
2020	224	2.54
2021	276	2.86
2022 (to end of Q3)	168	2.59

3.2.1.2 Contractor Management

The majority of current activities at Rabbit Lake are carried out by Cameco employees; however, oversight of contractors is guided by the Cameco corporate *Contractor Management Program* (CAM-CMP). This program is part of Cameco's integrated SHEQ management system and defines the general process and minimum SHEQ requirements for managing contractors across all of Cameco's sites worldwide. The CAM-CMP ensures:

- Risks are evaluated to identify and eliminate or control hazards.
- Duties of contractors are clearly understood.

- Contractors are adequately trained and qualified for the work.
- Cameco maintains oversight.

The Rabbit Lake contractor management process is guided by a suite of documents within the RAM-QMP. These documents set out comprehensive requirements for contractors to ensure they are held to the same standards as employees, including safety elements, such as participation in job hazard analyses.

3.2.2 Future Plans

Rabbit Lake will continue to verify systematically that the controls of the respective management system elements are effectively implemented. Processes, such as audit and management review, will ensure that enhancements to the site systems are realized.

3.2.3 Conclusion

The RAM-QMP is ensuring the management system aspects of all Rabbit Lake programs that address CNSC SCAs are meeting requirements. Through the RAM-QMP, the site focuses on fulfilling the commitments in Cameco's SHEQ Policy and ensuring a quality management approach is reflected in programs that ensure the quality of our processes and protect the health and safety of persons and the environment.

3.3 Human Performance Management

Human performance at Rabbit Lake is managed through various processes and systems implemented through the Rabbit Lake *Training Development Program* (RAM-TDP). Human performance management covers the activities that enable effective human performance and ensure there are sufficient site personnel in all relevant job areas that have the necessary knowledge, skills, procedures and tools in place to safely carry out their duties. Rabbit Lake has adopted a systematic approach to training (SAT) to ensure these requirements are being met.

3.3.1 Discussion

3.3.1.1 Training

Rabbit Lake recognizes that skilled, knowledgeable and qualified workers, at all stages of our activities, are an integral component of an efficient, safe and environmentally responsible operation. During the current licence term, Rabbit Lake implemented the requirements of CNSC REGDOC-2.2.2, *Personnel Training*, Version 2.

As described in CNSC REGDOC-2.2.2, Rabbit Lake has implemented SAT as a key component of the RAM-TDP. Implementation of SAT ensures workers are competent based on appropriate education, skills, experience and behaviours and provides a means of measuring, monitoring and improving the performance of workers. This has resulted in

improved training effectiveness and efficiency and has assisted in the continuous improvement of the RAM-TDP. The implementation of SAT at Rabbit Lake was a significant focus during the current licence term. All high-risk and medium-risk positions have been through the analysis phase of SAT. Training course materials for those positions have been designed, developed and implemented. Existing and new workers in these positions are regularly trained and granted new qualifications. New positions are monitored and analyzed for training requirements routinely.

Also, a focus during the licence term was the standardization of training, across Cameco, specific to radiation protection measures and implementation of core safety standards such as control of hazardous energy and confined space entry. The standardized approach to training across Cameco helped Rabbit Lake transition from production to care and maintenance with minimal safety and radiation incidents.

The RAM-TDP ensures all Rabbit Lake workers have training requirements assigned to them based on their role within the organization. Compliance to these training items is tracked by Cameco's *Learning Management System* (LMS). The LMS also enables Rabbit Lake to produce a list of mandatory qualifications.

3.3.2 Future Plans

Rabbit Lake will work with other groups in the corporation to continue to standardize training and training requirements. Through digital transformation, remote training opportunities are becoming more effective and will be evaluated for implementation where practicable. These opportunities will ensure continued compliance with the recently implemented requirements of CNSC REGDOC-2.2.2.

3.3.3 Conclusions

During the current licence term, Rabbit Lake has made significant advancements using SAT to document training and ensure all people on site have the training they require to do their jobs safely. Rabbit Lake will continue to focus on ensuring quality training programs are designed, developed and implemented during the next licence term.

3.4 Operating Performance

Operating performance at Rabbit Lake tracks how the licensed activities are conducted to inform effective performance of the facility. Cameco has developed and implemented programs to mitigate potential risks, maintain integrity of facilities and apply managed processes for operations and control. Rabbit Lake reports operational performance, including safety performance, to the CNSC staff annually. Radiation and environmental protection results are reported quarterly to the CNSC staff and yearly in the Rabbit Lake Operation Annual Report. Rabbit Lake also provides notification to the CNSC staff of any significant event that occurs outside of normal operations as well as posting these events on our website in accordance with our approved *Public Information Program* and CNSC REGDOC-3.2.1, *Public Information and Disclosure*.

Operating limits for the site are specified in the RAM-MFLM and activities must meet the requirements of the *Radiation Code of Practice* (RCOP) and *Environmental Code of Practice* (ECOP). Further, Rabbit Lake utilizes a formal change management process to improve workflow processes, material management, operator care and engineering reliability with these activities being tracked and documented through the RAM-QMP. This formal approach is part of a larger corporate operational improvement effort.

The Rabbit Lake *Eagle Point Mine Program* (RAM-EPMP) describes the mining processes at the Eagle Point mine, which ensures risks in each area of the mine are identified, reduced and mitigated through assessments that encompass water inflow potential, radiation protection and ground stability. Through this program, Rabbit Lake evaluates area-specific risks, develops ground support models, co-ordinates activities between organizational departments and facilitates third-party reviews of proposed ground support and development parameters during active mining.

The Rabbit Lake *Mill Operations Program* (RAM-MOP) applies to the activities required to manage the milling of ore from the Eagle Point mine when in production as well as the water handling and water treatment functions at Rabbit Lake. The RAM-MOP ensures safety, radiation, environmental and product quality risks are systematically identified, assessed and mitigated.

3.4.1 Discussion

The current Rabbit Lake licence authorizes an annual production rate up to 4.25 million kg U from the Rabbit Lake mill. Previous environmental impact statements have considered annual production of up to 6.5 million kg U. Under the current licence, Cameco is required to provide to notification to the CNSC that proposed activities meet CNSC requirements and are within the objectives of the licensing basis prior to increasing annual production above 4.25 million kg U or processing new ore sources. From 2013 to 2016, Rabbit Lake produced uranium concentrate primarily from the milling of Eagle Point ore. Production during this period remained below the annual production limit. Table 3.4-1 provides a summary of annual production during the current licence term.

Table 3.4-1: Annual production rates.

Year	Annual Production (million kg U)
2013	1.59
2014	1.60
2015	1.62
2016[1]	0.43
2017-2022	0

(1) Rabbit Lake announced transition to a safe state of care and maintenance in April 2016.

While in production from 2013 to 2016, Rabbit Lake demonstrated the ability to mine and mill uranium ore while maintaining the safety of workers and the public as well as protecting the environment. Operating processes and criteria for mining and milling are well understood and documented.

Cameco made the decision to suspend production at Rabbit Lake in 2016 as a result of uranium market conditions. Formal announcement of this decision was made in April 2016 with transition to a safe state of care and maintenance occurring throughout the remainder of the year. This transition resulted in the suspension of processes related directly to mining and milling activities that supported the production of uranium. With the transition complete, the focus of operations changed to managing the site in a safe care and maintenance state. The following represents the principal areas of focus during care and maintenance:

- Maintaining the safety of the public, workers and protection of the environment.
- Collecting and treating potentially contaminated water.
- Ensuring commitments to our stakeholders are met (ensuring regulatory compliance and maintaining ongoing relationships with our target communities).
- Maintaining critical infrastructure.

3.4.2 Future Plans

Cameco is focused on taking advantage of the long-term growth we see coming in our industry, while maintaining the ability to respond to market conditions as they evolve. With this noted, a decision towards a resumption of production at Rabbit Lake is not expected until market conditions improve. In the interim, the site is currently being maintained in a safe state of care and maintenance. During care and maintenance, Rabbit Lake may consider undertaking strategic projects. This may include, but is not limited to, conducting an electrical resistance heating program(s) to actively thaw frozen tailings layers within the RLITMF.

Should a decision be made to resume production at Rabbit Lake, Cameco feels strongly in our ability to transition the operation back to production based on the strength of our

management systems and utilizing experience gained in previously transitioning Rabbit Lake (and more recently, Key Lake and McArthur River) back into production.

3.4.3 Conclusions

Until 2016, Cameco operated safely and produced uranium concentrate while maintaining the safety of the public and workers and protecting the environment. Cameco successfully placed Rabbit Lake into care and maintenance in 2016 and since that time the operation has demonstrated continued effective operation and commitment to our compliance obligations.

3.5 Safety Analysis

The safety analysis for Rabbit Lake is derived from the past environmental assessments and ecological risk assessments as well as the RAM-MFLM and its supporting program documents. Together, these programs and mitigation features are meant to ensure the mine and mill complies with all regulations and will be protective of people and the environment. To that end, Rabbit Lake systematically assesses risk using risk analysis tools to ensure sustainable and safe operation. These tools include hazards and operability assessments (HAZOPs); job hazard analyses (JHAs); and field level risk assessments (FLRAs). These measures are used to assess new tasks, processes, or equipment.

Additionally, the Rabbit Lake approach to risk management is guided by the Cameco corporate standard for the systematic identification and management of risk. The specific risk management tools within the Rabbit Lake risk management system were adapted to fit under the ISO 31000 standards that guide Cameco's Risk Policy and Risk Management Program. These documents are designed to provide a consistent approach to how risks are evaluated, mitigated and managed throughout the corporation. The program also includes clear specifications on the responsibilities and accountabilities for various levels of risk.

3.5.1 Discussion

3.5.1.1 Environmental Assessments

The most recent environmental assessment (EA) for Rabbit Lake was completed in 2008 to support continued mining of the Eagle Point orebody as well as the proposed processing of Cigar Lake uranium rich solution through the Rabbit Lake mill [1]. The federal and provincial governments approved this EA in June and August 2008, respectively. Although Cameco and Orano announced in December 2011 that all ore from the Cigar Lake mine would be processed at the Orano McClean Lake mill, the 2008 EA still provides the framework for the safety analysis of key facilities at Rabbit Lake such as the AGTMF and RLITMF.

Cameco submitted an Environmental Risk Assessment (ERA) as part of the 2008 EIS document. As required, Cameco now reviews or updates the ERA on a five-year cycle in

accordance with Canadian Standards Association (CSA) N288.6:12 *Environmental risk assessments at nuclear facilities and uranium mines and mills*. Further, Cameco prepares an Environmental Performance Report (EPR) on a similar 5-year cycle that provides an update, assessment and summary of the operationally-relevant environmental data and other information relating to performance of our operations. The EPR also provides comparison of the current study period results to predictions made in the relevant EIS documents, including the ERA. The Rabbit Lake ERA and EPR are discussed further in Section 3.10.1.

3.5.2 Risk Analysis

Ongoing risk analyses are the primary tool to ensure that risks at Rabbit Lake stay within the licensing basis established in the recent 2008 EA as well as previous assessments completed for historically mined orebodies at the facility.

Cameco identified hazards at Rabbit Lake using risk analysis tools, such as HAZOPs, JHAs and FLRAs. These analyses ensure changes to the facility are controlled and that risks posed are acceptable. Rabbit Lake maintains a business level screening risk assessment, reviewed and updated annually, that documents the key risks at site.

Specific to the tailings management facilities at Rabbit Lake, Cameco had a dam safety review completed in 2020 for the AGTMF in accordance with Canadian Dam Association guidelines. The goal of this review is to assess and evaluate the safety of a dam against potential failure modes. The review was conducted by a third-party subject matter expert and is based on current knowledge and guidelines, which might be different than at the time of construction. At Rabbit Lake, the dam safety review found that the AGTMF dams were in a satisfactory condition, there were no dam safety deficiencies apparent, and that the dams appear stable with no visible signs that would suggest potential geotechnical instability. In addition to the AGTMF dam safety review, Cameco had a third-party subject matter expert conduct a Failure Modes and Effects Analysis (FMEA) for the AGTMF (as well as the RLITMF) in 2021. FMEA is a systematic, proactive method to identify potential credible failure modes, assess the likelihood and consequence of failure and the controls in place to address them. The FMEA process was able to highlight critical controls for each facility, areas of risk that were well managed, and areas that could be reduced further through additional study or implementation of mitigative actions. From this process, Cameco developed a risk register that presents the current known risks and ranking, and that can be updated to reflect changes to existing risks and to add new risks as they become known.

3.5.3 Future Plans

Risks at Rabbit Lake are well understood. During the current licence term, improvements in the risk assessment processes have helped inform the transition from operations to care and maintenance. These processes will enable Rabbit Lake to continue to manage risk while conducting activities authorized under the current licence.

3.5.4 Conclusions

Through various risk assessments, Cameco ensures adequate mitigation and management of these risks. As a result, Cameco's risk management at the Rabbit Lake operation is effective in ensuring the operation remains within the licensing basis while continuing to be protective of the environment, as well as the health and safety of people.

3.6 Physical Design

Physical design relates to activities that impact on the ability of systems, structures 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 principal facilities at Rabbit Lake are comprised of the Eagle Point mine, which produces uranium ore; a mill that produces a uranium ore concentrate; and, within the mill, a water treatment plant for treating water prior to release to the environment. Rabbit Lake manages the wastes generated from the production of the ore and uranium concentrate. Primarily, these are waste rock, and tailings.

Rabbit Lake utilizes facility change control and design control to ensure that any physical changes to the facility are reviewed and approved by appropriate personnel before implementation. The site employs an electronic system, which ensures site management is aware of proposed changes and associated risks and controls. It also ensures those responsible are made aware of the changes so that required approvals, including regulatory approvals, are in place prior to the change being implemented.

3.6.1 Discussion

The transition to care and maintenance in 2016 resulted in a large portion of the Rabbit Lake mill, specifically production related areas and circuits, being placed into an inactive state. At a high level, the following steps were taken to put the mill into care and maintenance:

- All production circuits were emptied during the shutdown process.
- Production circuits and components were flushed, cleaned and preserved.
- The mill ore pad was emptied of any remaining inventory.
- Water treatment circuit maintenance was completed.
- Sulphuric acid inventory was maximized prior to suspending acid plant production and preservation of the plant.
- Mill ventilation was adjusted to reflect contaminant source reduction and optimized heat retention.
- Minimum building temperature set-points were adjusted to reflect operational status of areas.

Each production circuit and associated components were systematically shut down as part of the transition. These inactive areas remain under routine inspection, with checks conducted and documented on a regular basis.

The focus of care and maintenance activities at Eagle Point are related primarily to the continued dewatering of the mine. There is currently no exploration, development or production underway or planned during care and maintenance and underground activities consist only of basic and required inspection and maintenance. Similar to the mill, a systematic process was followed to place the mine into care and maintenance:

- All production stopes were backfilled, and all development headings were secured with primary ground support installed.
- Remaining inventories of ore and mineralized material was removed from the Eagle Point ore pad to the underground workings or to the B-Zone ore pad.
- All areas underlying the crown pillar, identified during earlier investigations, were assessed for stability, tight filled where required and the results verified through a third-party evaluation.
- Mine infrastructure, including explosives, not required during care and maintenance were removed and mobile equipment not required during care and maintenance was preserved and moved to ventilated areas of the mine for storage.
- Inactive areas were sealed with shotcreted bulkheads to reduce potential ventilation losses.
- P-traps were installed at sealed bulkheads to promote drainage and prevent the accumulation of water behind bulkheads.
- Non-essential support facilities on surface were vacated, preserved and secured.

3.6.2 Future Plans

Over the term of the next licence, Rabbit Lake will continue to identify and pursue opportunities to improve efficiency while continuing to maintain the safety of workers and the public as well as protection of the environment. During care and maintenance, the focus of any design changes would be to improve the way that water is managed and treated at Rabbit Lake. For any new or changes to existing infrastructure, Cameco will follow the current design controls that have been shown to be effective at Rabbit Lake.

If a decision is made to resume production operations at Rabbit Lake, Cameco is confident that the management systems that we have in place would facilitate a safe transition into operations will maintaining protection of the environment. The focus of any restart activities would be on the safe and planned preparation of the mine and mill for return to operations. Key activities would include:

- Recruitment and training of staff.
- Pre-operation inspections of critical infrastructure.

- Repairs and upgrades to operational infrastructure, as required.
- Mine inspection, rehabilitation and development.

A critical aspect of any future decision to resume production at the mine or mill is a significant and sustained recovery of the market price for uranium.

3.6.3 Conclusions

Rabbit Lake has proven design processes, methods and infrastructure that are effective in protecting the environment and the health and safety of people while executing licensed activities.

3.7 Fitness for Service

Rabbit Lake continues to advance opportunities to improve the overall maintenance and reliability of the facility so that all equipment is available to perform its intended design function. The Rabbit Lake *Maintenance Program* (RAM-MP) describes the testing, inspection schedules and work procedures required to ensure that the physical condition of systems, components and structures remain in good operating condition.

The RAM-MP manages routine maintenance, inspection and testing to ensure the availability, reliability and effectiveness of facilities and equipment. The program helps increase equipment availability through more efficient planning, predictive maintenance techniques, training and documentation.

3.7.1 Discussion

During the licence term, Cameco, including Rabbit Lake, began a journey towards operational excellence. This encompassed many things, including asset management and reliability, in which Cameco strives to be an industry leader. Activities during care and maintenance focussed on maintenance of critical infrastructure in order to conduct licensed activities while maintaining the safety of the public, workers and protection of the environment. Specific focus is placed on maintenance of infrastructure required for ongoing collection and treatment of potentially contaminated water across the site as well as infrastructure necessary to maintain the Eagle Point mine in care and maintenance.

3.7.2 Future Plans

The RAM-MP provides the framework to effectively manage existing infrastructure to ensure it remains appropriate to safely execute licensing activities. Should a decision be made to resume production at a future date, Rabbit Lake would develop necessary plans and take appropriate measures to ensure that all infrastructure necessary for mining and milling of uranium ore is operationally ready. Historically, Cameco safely resumed mining and milling at Rabbit Lake following a period of reduced production and care and maintenance from 2000 to 2002 and, more recently, Cameco developed and executed an operational readiness plan for safe restart of our McArthur River and Key Lake

operations. A key component of operational readiness at these operations was development of inspection and testing and standard maintenance plans for assets that were idle during care and maintenance.

3.7.3 Conclusions

The RAM-MP has shown to be effective in ensuring proper maintenance schedules and procedures are followed to ensure the integrity of the operation's infrastructure. The RAM-MP has also been effective in adopting technology to improve the preventative and predictive maintenance approach.

3.8 Radiation Protection

The Rabbit Lake *Radiation Protection Program* (RAM-RPP) outlines how the site manages radiation protection issues with the goal of keeping radiation exposures to workers "as low as reasonably achievable, social and economic factors taken into account" (the ALARA principle). The RAM-RPP includes the RCOP, which details actions to be taken in response to radiation exposure and monitoring results. Cameco's periodic audits, reviews and self-assessments help identify improvements and provide assurance that the RAM-RPP is functioning effectively and efficiently.

To this end, radiation exposures are mitigated through a combination of engineering and administrative controls that include ventilation; shielding; training; zone control; radiation work permits; and personal protective equipment (e.g., respiratory protection). Cameco monitors and confirms the effectiveness of these controls through area monitoring, direct reading dosimeters, optically stimulated luminescence dosimeters and personal alpha dosimeters.

3.8.1 Discussion

During the current licence period, Rabbit Lake maintained limited radiological exposure of workers at the operation. The RAM-RPP has been effective in controlling the potential hazards during both the initial production period of the licence term as well as during the transition to and period of care and maintenance. This is demonstrated by the results of the radiation monitoring of Nuclear Energy Workers. Monitoring data is reviewed, consolidated and analyzed regularly to inform work practices and optimize controls. Results are submitted to the CNSC monthly and quarterly for review. The effective and maximum doses received by workers during the licence period are summarized in Table 3.8-1.

Table 3.8-1: Summary of dose statistics during licence term.

	Average Effective Dose (mSv)	Maximum Effective Dose (mSv)
2013	1.30	11.67
2014	1.35	8.84
2015	1.36	9.14
2016	0.85	4.95
2017	0.40	1.56
2018	0.46	1.70
2019	0.75	2.73
2020	0.70	2.93
2021	0.57	2.47
2022 (to end of Q3)	0.20	1.24

As set out in the above table, average and maximum effective doses over the licence period remain far below the regulatory limits of 50 mSv per year and 100 mSv over a five-year period, respectively.

Within the RAM-RPP, the RCOP specifies action levels that, if exceeded, may indicate the potential for a loss of control of the RAM-RPP. The RCOP details specific actions to be taken in response to an exceedance of an action level. During the current licence term, there were no action level exceedances at Rabbit Lake.

3.8.2 Future Plans

Rabbit Lake will continue to look for opportunities to continually improve the performance of the RAM-RPP in the next licence term. Cameco's periodic audits, reviews and self-assessments help identify improvements and provide assurance that the RAM-RPP has and continues to function effectively and efficiently. On an annual basis, Rabbit Lake identifies groups and/or individuals with the highest doses and works to set targets around improving dose rates. Further, during the recent care and maintenance period, Rabbit Lake continues to work to efficiently conduct inspection and maintenance activities at Eagle Point to reduce the time spent by workers underground.

3.8.3 Conclusions

The RAM-RPP is working as intended to keep worker exposures ALARA. During the current licence term, radiation protection measures remained effective and maximum yearly doses have consistently remained well below the regulatory limit.

3.9 Conventional Health and Safety

Cameco strives to be a leading performer in conventional health and safety through development of a strong safety culture Cameco's safety culture framework is a set of high-level principles and associated traits or characteristics that articulate the desired behaviours associated with a strong safety culture. Cameco conducts periodic safety culture assessments in accordance with CNSC REGDOC-2.1.2, *Safety Culture*. These assessments are used by the Cameco management teams to improve and strengthen safety culture at the site.

Workplace safety hazards are managed as part of the processes described within the Rabbit Lake *Occupational Health and Safety Program* (RAM-OHSP). In general, risks to workers are controlled through the adoption of a safety system comprised of five elements:

- Site inspections: formal and informal hazard identification programs by supervisors, Occupational Health Committee and safety department personnel.
- Safety meetings: once every shift with each department to discuss safety topics, review safety-related procedures and discuss incidents.
- Daily contact card: a daily practice for supervisors and workers to initiate dialogue regarding safety topics, to identify risks associated with assigned tasks and to track any safety-related issues encountered in the workplace.
- Job task observations: in-person, third party observation of a worker performing a specific task.
- Work permits: activity-specific approvals required before tasks, such as those required for confined space entry or involving hot work (welding).

Cameco also manages hazards using job hazard analysis conducted prior to completing non-routine tasks. During the current licence term, Cameco increased the focus on the development of standardized practices for core safety aspects, such as control of hazardous energy and confined space entry.

The effectiveness of these controls is assessed through indicators, such as audits, preventative and predictive maintenance plans and compliance to program requirements. Specific to worker safety, measures include first aids, medical incident injuries, lost-time injuries (LTI) and the total recordable injury rate (TRIR). Results are routinely reviewed internally and reported externally on a monthly and annual basis.

3.9.1 Discussion

3.9.1.1 Safety Statistics

Table 3.9-1 provides a summary of the safety statistics over the licence term. As is shown, injuries have been controlled with no significant incidents even with challenges presented by the transition to care and maintenance. Table 3.9-1 also shows the smaller

workforce required to maintain Rabbit Lake in care and maintenance after 2016. With a smaller workforce, a single incident can dramatically impact these statistics but may not be indicative of a decline in overall performance.

Table 3.9-1: Safety statistics during licence term.

	Total FTE Workers[1]	Number of LTIs[2]	TRIR	Frequency Rate[3]	Severity Rate[4]
2013	744	0	3.50	0	25.8
2014	669	1	3.60	0.15	11.4
2015	610	2	4.26	0.33	55.3
2016	377	1	1.89	0.26	2.7
2017	97	0	1.03	0	0
2018	99	0	5.03	0	0
2019	95	1	2.10	1.05	104.8
2020	88	0	1.13	0	40.9
2021	96	0	1.04	0	0
2022 (to end of Q3)	87	0	3.08	0	0

(1) Total number of workers (employees and contractors) expressed as full-time equivalents (FTE) is total person-hours / 2,000 hours worked per employee per year.

(2) Lost-time incident - an injury that takes place at work and results in the worker being unable to return to work for a period of time.

(3) Frequency rate - the accident frequency rate measuring the number of LTIs for every 200,000 person-hours worked at the site. Frequency = [(# of injuries in reporting period) / # of hours worked in reporting period)] x 200,000.

(4) Severity rate - the accident severity rate measures the total number of days lost to injury for every 200,000 person hours worked at the site. Severity = [(# of days lost in reporting period)/# of hours worked in reporting period)] x 200,000.

Overall, the systems and controls in place to prevent injuries and ensure the health and safety of all employees and contractors are sufficiently robust. Rabbit Lake recorded successively lower TRIRs in 2020 and 2021 and received recognition from the Saskatchewan Mining Association (SMA) for safety performance in 2021. As well, internal to Cameco, Rabbit Lake was awarded Cameco's top safety honour, the Mary-Jean Mitchell Green award in 2020.

Rabbit Lake recorded one serious injury during the 10-year licence term. In March 2015, a driller was struck by core tube while drilling on the 400 level of the Eagle Point mine. As the driller was preparing to pull the core tube, they removed one drill rod with the water swivel attached and the next core tube slide out of the opening and struck the driller's upper left thigh temporarily pinning the worker to the ground. The driller was able to move the rod and call for assistance. The Mine Rescue Team (MRT) was

dispatched and stabilised the driller. The MRT transported the worker to the care of the site nurse until the driller was transported off site by air ambulance. The driller received an injury to the upper thigh, which required off-site treatment and surgery with a hospital stay of < 72 hours. There was no impact or risk to other persons due to this event.

Cameco investigated this event to identify the root causes and make recommendations for corrective and/or preventative actions. The results of the investigation indicated that there were two causal factors that contributed to the event. Information on each of the causal factors is provided below:

- A mid-run miss-latch of the inner core tube head assembly from locking coupling occurred. A miss-latch is not a frequent occurrence, but latch failures do occur and may occur several times a year in a drill program. While the specific mechanism of failure could not be fully confirmed through the investigation, it was a causal factor to the incident.
- The driller did not follow the written work procedure. Although the worker was experienced, the worker did not follow procedures in the event of a miss-latch occurrence.

As a result of the investigation, Rabbit Lake initiated a review of the proper inspection procedures for inner core tube head assemblies with all drill crews that reinforced the pre-use inspection requirements. Further, a review of the procedures for up-hole drilling and core retrieval with all drill crews in the context of the event, with emphasis on the hazards and procedural controls was also conducted.

3.9.1.2 Occupational Health Committee

The Occupational Health Committee (OHC) at Rabbit Lake consists of employee and employer representatives who are responsible for reviewing past health and safety incidents, conducting safety inspections, evaluating safety programs and recommending health and safety improvements. Worker involvement and consultation is openly sought and encouraged through daily work assignment meetings, regular safety meetings, town hall meetings and written communications.

3.9.1.3 COVID-19 Response

Cameco closely monitored the developments related to the COVID-19 pandemic during the licence term. Cameco’s priority remained the protection of the health and well-being of our employees, their families and their communities. The Cameco Corporate Crisis Management Plan was activated, which includes our Pandemic Plan and our various Local and Corporate Business Continuity Plans. Following the precautions and restrictions enacted by all levels of government where we operate and considering the unique circumstances at each of our operating sites, we proactively implemented a number of measures and made a number of decisions to ensure a safe working environment for all our employees, including:

- Transitioning eligible employees to begin working remotely from home.

- Mandating that meetings be conducted by phone or videoconference where possible.
- Suspending all business travel, unless approved by the CEO.
- Restricting non-essential contractors, visitors and deliveries at all locations.
- Adopting screening protocols for access to our facilities that aligned with the directives of government and public health authorities.
- Implementing a number of additional protective measures in the workplace, including increased sanitization, physical distancing and use of face masks.
- Setting up and awarding COVID-19 Relief Funds totaling $1.25 million to support our northern Saskatchewan and Ontario communities impacted by the pandemic.

In 2021, building upon our established Exposure Control Plan, we commenced rapid antigen screening on all incoming personnel and, implemented a requirement that all workers and visitors to our Cameco facilities must be fully vaccinated. To support this requirement, we ran a series of vaccination clinics at our site health care centres. With the help of the provincial health authority, our nursing staff administered close to 700 doses to workers at our northern Saskatchewan operations.

Reflecting on the current guidance from provincial and federal health authorities, and the implementation of our vaccination requirement, we have been able to systematically roll back many of our protocols in 2022, while ensuring the protection of our workers.

3.9.2 Future Plans

Efforts during the next licence term will continue to build a culture focused on continuous safety improvement and accountability. Site personnel will continue to be encouraged to report all incidents, no matter how minor, into CIRS.

An example of ongoing safety culture improvement is the continued implementation of the Field Leadership Program. This program is designed to ensure that all personnel on site understand how they promote a safe, productive work environment. This is accomplished through having management present at the workface to ensure that policies, programs, standards and regulatory requirements are implemented and effective for Rabbit Lake. Additionally, the program works to ensure that all workers understand the hazards of the work they are undertaking and the controls in place to mitigate those hazards. Cameco implements this through in-the-field discussions between management and workers that not only allow for verification of safe work practices, but also provides coaching opportunities where improvements can be made.

3.9.3 Conclusions

Safety is a core value at Rabbit Lake and one of Cameco’s highest corporate priorities. Further, a safe, healthy and rewarding workplace is one of our organizational measures of success. Promoting a strong safety culture at Rabbit Lake is achieved through continuous safety improvement and consistent application of the RAM-OHSP, including ongoing

education and training, as well as inspections and improvements to processes and safety equipment to ensure all people working at site are equipped to work safely.

3.10 Environmental Protection

The Rabbit Lake *Environmental Protection Program* (RAM-EPP) formalizes the approach to environmental protection at the site. The RAM-EPP includes details for identifying, controlling and monitoring potential impacts to the environment. The program includes the ECOP that describes required actions to be taken in response to an exceedance of an environmental action levels for treated water. During the current licence term, Rabbit Lake worked with the CNSC to implement changes to treated water action levels in accordance with CSA N288.8-17, *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities*. Implementation was completed in April 2022. Additional environmental protection regulatory documents and standards implemented during the licence term are listed below:

- CSA N288.4-10, *Environmental Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*
- CSA N288.5-11, *Effluent Monitoring Programs at Class I Nuclear Facilities and Uranium Mines and Mills*
- CSA N288.6-12, *Environmental Risk Assessment at Class 1 Nuclear Facilities, and Uranium Mines and Mills*
- CSA N288.7-15, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills*
- CNSC REGDOC-2.9.1, *Environmental Protection: Environmental Principles, Assessments and Protection Measures,* Version 1.2

Cameco maintains a corporate ISO 14001 certification for our operation’s environmental management systems. The ISO 14001 certification ensures that Rabbit Lake meets the requirements of Cameco's integrated SHEQ Policy, that include the following:

- Identifying and mitigating environmental risks.
- Complying with applicable laws and regulations.
- Monitoring and measuring operational impacts.
- Reducing and effectively managing waste.
- Minimizing potential impacts to the environment.

Cameco’s periodic audits, reviews and self-assessments help identify improvements and provide assurance that the RAM-EPP is functioning effectively. Deficiencies or findings identified through these efforts are documented and addressed. As one form of self-assessment, Cameco conducts annual management reviews where minutes and follow-up actions to outstanding issues from the audits and reviews are documented. Further, within

the operations' annual reports, discussion is provided on annual environmental management objectives, goals, and targets.

Two key areas of environmental focus at Rabbit Lake are preventing uncontrolled releases to the environment and collecting and treating potentially contaminated water.

3.10.1 Discussion

3.10.1.1 Treated Water

As mentioned above, a key area of environmental control at Rabbit Lake and one of the key areas of focus is treating potentially contaminated water collected from surface and underground. The main sources of potentially contaminated water at Rabbit Lake are the Eagle Point mine, the RLITMF raise water system and the mill production circuits during production. All water collected is sent to the water treatment plant (WTP) within the Rabbit Lake mill. The mill WTP is a two-stage chemical treatment process that relies on pH adjustment, reagent addition and particle settling for the effective removal of metals and radionuclides. Treated water that meets regulatory requirements is released to Horseshoe Creek via a single discharge location.

During the current licence term, Rabbit Lake has continually monitored the quality of its treated water and implemented process enhancements to facilitate continual improvement. The key focus of these activities was to reduce total loadings of constituents of potential concern (COPCs) to the environment.

Specific examples of WTP improvements that Rabbit Lake undertook during the licence term were related to improving water treatment efficiency. Specifically, the effluent treatment building and sand filters were bypassed, converting to a passive flow through system of settling ponds. This was achievable due to upgrades to the water treatment system completed in the previous licence term and following a trial campaign which demonstrated that additional treatment from the sand filters and effluent treatment building was not required. These improvements, and resulting reductions in COPCs, particularly uranium and arsenic, are reflected in Table 3.10-1.

Table 3.10-1: Rabbit Lake treated water loadings to the receiving environment.

	Total Water Discharged (m^3)	Total Loadings (kg)[1]			
		Uranium	Molybdenum	Selenium	Arsenic
2013	4,252,361	266.8	1,376.7	22.0	23.4
2014	4,296,718	199.7	1,212.7	18.0	24.1
2015	4,243,648	220.7	1,139.2	17.9	16.9
2016	4,494,755	326.9	1,226.1	15.8	11.0
2017	3,898,660	274.0	542.7	9.2	3.7
2018	4,218,996	135.8	757.4	10.9	3.9
2019	3,931,266	106.1	623.4	9.1	3.7
2020	3,780,031	80.3	696.9	9.8	3.4
2021	3,831,634	68.9	815.3	9.5	4.5
2022 (to end of Q3)	2,448,312	50.1	378.3	5.9	2.3

(1) Total loadings (kg) are calculated as annual mean concentration multiplied by the total water discharged (m^3). When annual mean concentrations are below detection limit, detection limit value is used for total loadings calculation.

3.10.1.2 Environmental Code of Practice

As noted previously, Rabbit Lake worked with the CNSC to implement changes to treated water action levels in accordance with Canadian Standards Association N288.8-17 *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities*. Implementation was completed in April 2022. There were no action level exceedances at Rabbit Lake during the licence term.

3.10.1.3 Air Quality

Ambient air quality monitoring is an integral part of the environmental monitoring program at Rabbit Lake. Cameco conducts environmental monitoring for ambient radon concentrations annually using passive sampling units (i.e., track etch cups). Monitoring is conducted at representative locations within and surrounding the Rabbit Lake surface lease boundary. During the current licence term, the ambient radon concentrations shown in Figure 3.10-1 were less than the typical range of northern Saskatchewan regional background concentrations, which range from 37 to 74 Bq/m^3.

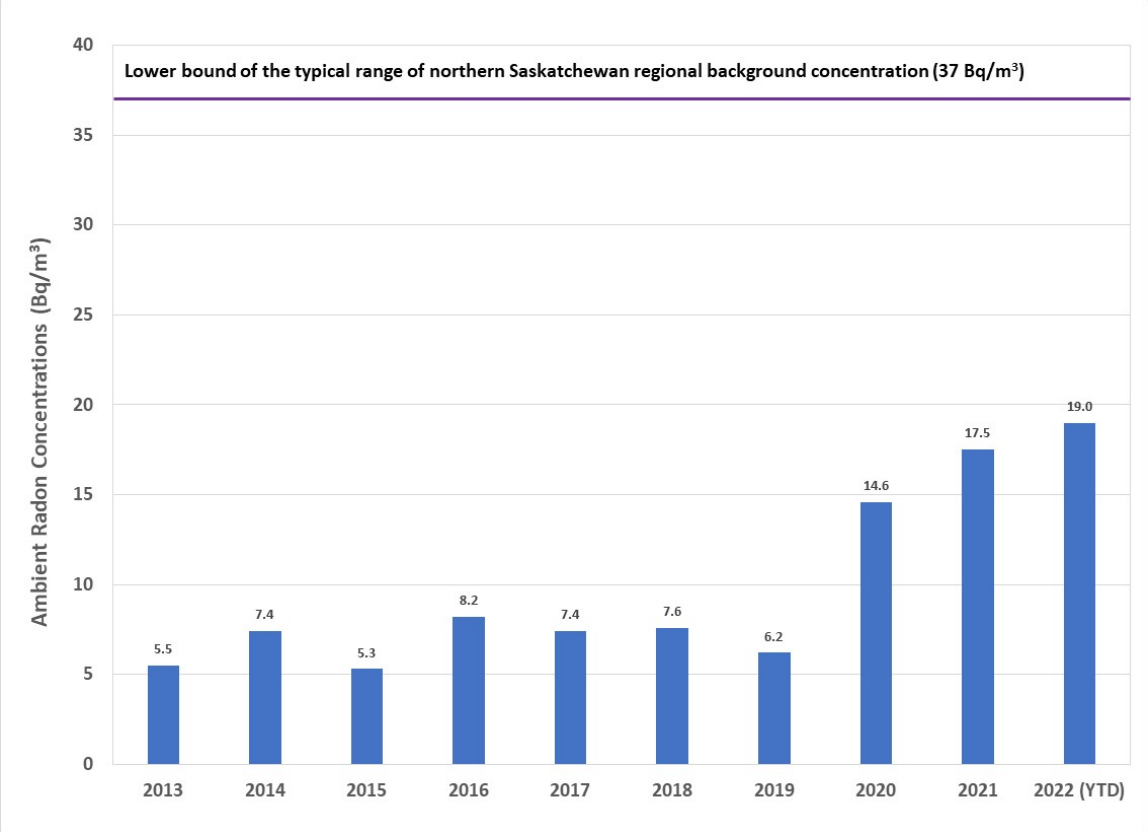


Figure 3.10-1: Ambient air quality radon monitoring concentrations.

In addition to radon sampling, Rabbit Lake utilizes high-volume air samplers for monitoring of particulate matter, metals and radionuclides. Table 3.10-2 provides a summary of the annual mean concentrations of particulate matter and select metals. The results show that the ambient air quality at Rabbit Lake is well below the reference criteria during the current licence term.

Table 3.10-2: Ambient air quality monitoring annual mean concentrations.

	Particulate Matter ($\mu g/m^3$)[1]	**Metals ($\mu g/m^3$)[2]**		
		Arsenic	**Nickel**	**Uranium**
2013	7.6	0.00018	0.00001	0.00103
2014	6.2	0.00022	0.00014	0.00196
2015	6.9	0.00021	0.00019	0.00189
2016	4.9	0.00028	0.00054	0.00106
2017	4.6	0.00029	0.00040	0.00019
2018	3.9	0.00034	0.00018	0.00028
2019	4.3	0.00013	0.00014	0.00012
2020	3.0	0.00025	0.00058	0.00012
2021	3.6	0.00017	0.00016	0.00015
2022 (to end of Q3)	3.6	0.00048	0.00010	0.00007
Reference Value	**60**	**0.04**	**0.06**	**0.06**

(1) Reference value from SMOE, Table 20: *Saskatchewan Ambient Air Quality Standards (SAAQS)*. Values are calculated as geometric means.

(2) Metal reference annual air quality levels derived from the Ontario Ministry of Environment's *Ontario's Ambient Air Quality Criteria* and are shown for reference only.

Additional air and terrestrial monitoring are also conducted as part of the approved environmental monitoring programs. When the Rabbit Lake mill is producing uranium concentrate, point source monitoring is conducted from the acid plant main stack and yellowcake plant stack. Further, when in production, Rabbit Lake also conducts ambient air monitoring for sulphur dioxide.

Terrestrial monitoring is currently conducted on a ten-year frequency and includes a lichen chemistry program. Monitoring conducted in the licence term last took place in 2019. Results from the program demonstrated that lichen chemistry values were lower than the previous monitoring years, which was likely a reflection of the decreased air emissions after Rabbit Lake entered the care and maintenance period.

3.10.1.4 Environmental Risk Assessment

In accordance with CSA N288.6-12 *Environmental risk assessments at Class 1 nuclear facilities and uranium mines and mills*, environmental risk assessments (ERA) for the Rabbit Lake operation are reviewed or updated on a five-year cycle. During the current licence term, Cameco completed two ERAs (2015 and 2020) for Rabbit Lake that demonstrated that human health and the environment in the vicinity of the operation remain protected.

Historic measured loadings to the receiving environment, combined with predicted future loadings for Rabbit Lake are input to the Rabbit Lake ERA. The ERA is an important tool to assess potential future effects to the environment and human health from the continued operations and decommissioning of Rabbit Lake.

The most recent ERA for Rabbit Lake was completed in 2020 and was completed in accordance with CSA N288.6. As noted in the ERA, Rabbit Lake has the potential to influence the following four watershed areas in the vicinity of the site:

- Horseshoe Creek watershed,
- Parks Lake watershed,
- Link Lakes watershed, and
- Collins Bay.

The ERA considered the influence of Rabbit Lake (past, present and future) on these watersheds. In the 2020 ERA, detailed modelling was conducted for the Horseshoe Creek watershed and Collins Bay as well as a review of the previous assessments completed for the Parks Lake and Link Lakes watersheds. 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 Rabbit Lake remain protected.

Further, the ERA and routine monitoring results continue to demonstrate that the site remains within the objective of the licensing basis and previous environmental assessment predictions. A summary of the 2020 ERA is posted on the Cameco website [2].

3.10.1.5 Environmental Monitoring Program

Rabbit Lake conducts comprehensive aquatic monitoring in order to meet the requirements of Environmental Effects Monitoring (EEM) program in accordance with the *Metal and Diamond Mining Effluent Regulations* (MDMER), as well as the Environmental Monitoring Program (EMP) as outlined in the RAM-EPP and the Saskatchewan Ministry of Environment (SMOE) Approval to Operate Pollutant Control Facilities.

Throughout the licence term, Cameco completed the EEM and EMP programs in the Horseshoe Creek drainage on a three-year frequency, with reports submitted in 2014, 2017 and 2020. The 2020 program was a comprehensive monitoring program that fulfilled both EEM and EMP requirements. The program showed that overall, COPC concentrations in the sampled media remained consistent with historical results and that temporal trends have not been observed in the water quality, sediment chemistry and fish tissue results during the current licence term.

Currently, Cameco completes monitoring in the Link Lakes drainage on a ten-year cycle, with the last program occurring in 2017. Results from the program demonstrated that

values in sampled media were consistent with historical results and that fish tissue concentrations remained below applicable guidelines.

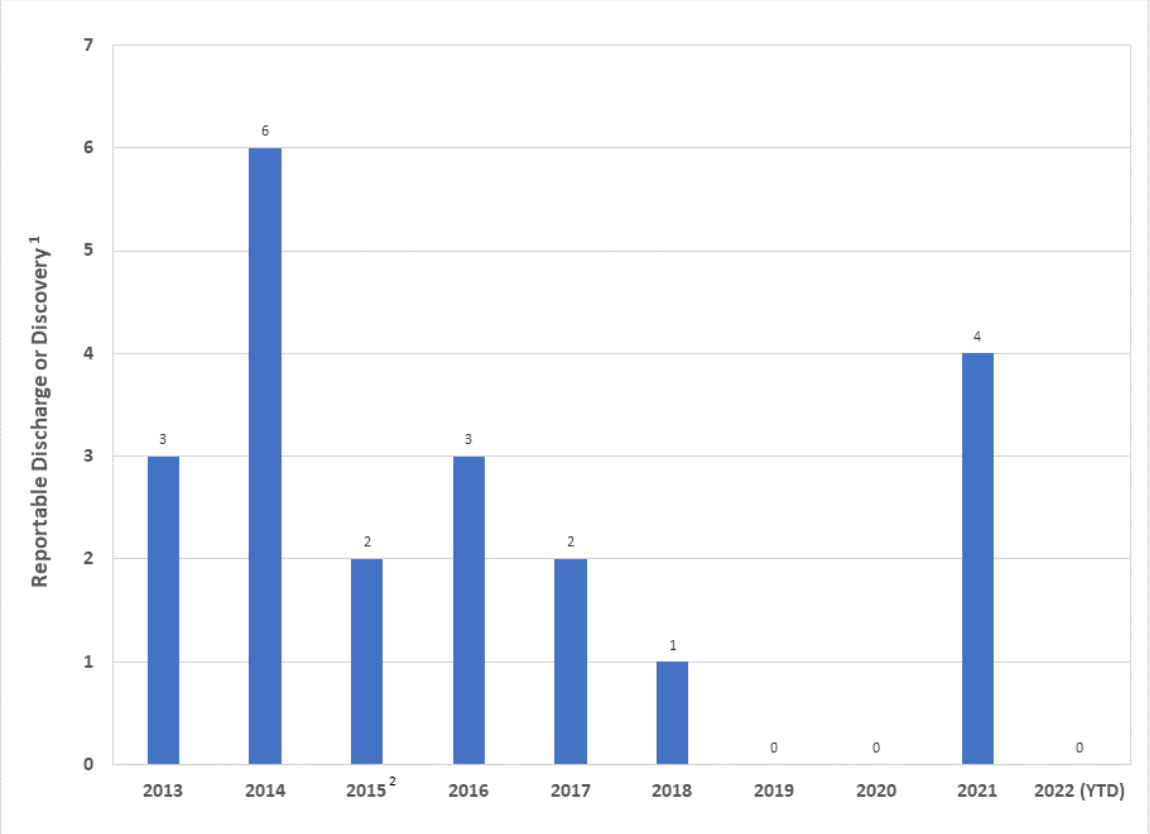
3.10.1.6 Environmental Performance Report

The Environmental Performance Report (EPR) is a requirement of the SMOE for mining operations in the province of Saskatchewan. The EPR provides an update, assessment and summary of the operationally-relevant environmental data and other information relating to performance of Rabbit Lake. The report also provides comparison of the current study period results to predictions made in the relevant ERA documents. The EPR includes an overall evaluation of environmental monitoring and the environmental condition around Rabbit Lake. Further, the EPR provides recommended improvements to site monitoring activities and programs.

In accordance with the provincial requirements, Cameco completes the EPR on a five-year cycle. During the current licence term, EPRs were submitted in 2015, which captured the years 2010 to 2014 inclusive and in December 2020, which captured the years 2015 to 2019 inclusive. Overall, as demonstrated in the 2015 and 2020 EPRs, monitoring results from the RAM-EPP collectively illustrated that Rabbit Lake is performing within the scope of the RAM-EPP and predictions of previous ERAs, and that the environment and human health in the vicinity of the site remains protected.

3.10.1.7 Reportable Discharges and Discoveries

During the licence term, 21 events were reported to CNSC that were classified as reportable discharges or discoveries in accordance with the regulations of the Province of Saskatchewan. Cameco's quick response and implementation of corrective actions resulted in minimal impact to the environment for all events. A summary of reportable discharges at Rabbit Lake is provided to the Commission in the annual *Regulatory Oversight Report for Uranium Mines and Mills.* Additionally, all reportable discharges, including a summary of the event, are posted on the Cameco website. A summary of reportable discharges during the licence term is provided in Figure 3.10-2, showing a reduction in discharges and discoveries during the current licence term.



(1) Includes discharges of treated effluent in accordance with provincial legislation.

(2) New legislation introduced by the Province of Saskatchewan in 2015, provided new criteria for classification of reportable discharges and discoveries.

Figure 3.10-2: Rabbit Lake reportable discharges and discoveries.

3.10.2 Future Plans

Throughout the next licence term, Rabbit Lake will continue to examine opportunities to more efficiently manage and treat water with the goal to reduce loadings of COPCs to the environment.

3.10.3 Conclusions

The RAM-EPP is effectively managed and has not only ensured the operation remains in compliance with all environmental regulations, but also that the operation's potential environmental impacts are controlled and monitored. Rabbit Lake sets continuous improvement goals and benchmarks its performance in achieving them. During the current licence term, Rabbit Lake demonstrated effective protection of the environment.

3.11 Emergency Management and Fire Protection

The Rabbit Lake *Emergency Preparedness and Response Program* (RAM-EPRP) and the *Fire Protection Program* (RAM-FPP) describe how Rabbit Lake prepares for and

addresses emergencies that may impact the health and safety of the workforce, the environment and the protection of property. Together, they ensure that appropriate emergency response and contingency plans and procedures are developed, maintained and readily available for use.

As with the other safety and control areas, risks are systematically identified and managed using administrative and engineered controls. Administrative controls include, but are not limited to training, routine drills and exercises, communication protocols and the development of a knowledgeable emergency response teams responsible for responding to emergencies on surface or underground. Engineered controls include alarms (fire and smoke sensors, underground stench gas system), emergency facilities (health centre, fire hall and underground refuge stations) and equipment (fire truck, ambulance and spill response equipment). Cameco's periodic audits, reviews and self-assessments help identify improvements and provide assurance that the management systems are functioning effectively and efficiently.

3.11.1 Discussion

3.11.1.1 Emergency Management

In the transition to care and maintenance, the Rabbit Lake Emergency Response Team (ERT) and Mine Response Team (MRT) were combined into a single site ERT with combined surface and underground response capabilities. Throughout the current licence term, the ERT safely responded when required to do so. Debrief meetings were held after each event with the objective of identifying strengths and opportunities for improvement. Cameco reports instances of ERT mobilization to the CNSC Duty Officer as required by the CNSC and posts information specific to these events on our website.

Emergency response plan training is provided to all new workers, including identification of responsibilities during an emergency. Further, training in all aspects of emergency response continues at Rabbit Lake. Currently, the site has approximately 25 members of the site ERT with additional support available, if required, through existing mutual aid agreements.

Cameco completes testing of the RAM-EPRP, including that required by provincial and federal legislation, through tabletop exercises, drills, or simulations. The testing is intended to evaluate emergency preparedness, increase awareness, familiarity and confidence with the RAM-EPRP, as well as validate its effectiveness. Cameco carries out all testing of the RAM-EPRP in accordance with internal, provincial and federal regulatory requirements. A summary of the RAM-EPRP testing conducted during the current licence term is provided in Table 3.11-1.

Table 3.11-1: Emergency response testing during current licence term.

	Tabletop Exercises	Drills	Simulations
2013	2	5	2
2014	0	4	1
2015	0	9	1
2016	2	6	1
2017	6	5	6
2018	2	6	3
2019	4	7	4
2020	4	7	4
2021	3	7	5
2022 (to end of Q3)	2	4	2

In addition to on-site training and testing, when producing previously, Rabbit Lake response team members have showcased their skills by participating in annual provincial mine rescue competitions sponsored by the Saskatchewan Mining Association.

3.11.1.2 Fire Protection

Fire protection at Rabbit Lake is facilitated by the RAM-FPP. The RAM-FPP is in compliance with provincial legislation, which incorporate by reference the *National Fire Code of Canada* and the *National Building Code of Canada,* including applicable province-wide prescribed exemptions and other modifications. This program ensures effective management of fire prevention, detection and suppression systems and processes at site. A third-party expert conducted a fire hazard assessment at Rabbit Lake in 2021, as an update to the 2010 assessment. This assessment did not identify any significant issues related to fire protection measures at Rabbit Lake. Other (minor) recommendations from this assessment will be tracked and completed within Cameco's corrective action process.

3.11.2 Future Plans

The RAM-EPRP and the RAM-FPP are meeting regulatory requirements with training and testing as a key component of ongoing efforts for continuous improvements of the programs. Cameco is working towards implementation of CSA N393-13, *Fire Protection for Facilities that Process, Handle, or Store Nuclear Substances* by December 31, 2023. Overall, the site has been diligent in dealing with action items and working to ensure compliance. In this regard, Rabbit Lake continues to make adequate provision for the protection of the environment as well as the health and safety of persons.

3.11.3 Conclusions

The RAM-EPRP and RAM-FPP are meeting regulatory requirements with ongoing training opportunities being provided to ERT members. Recent third-party expert assessments have indicated that Rabbit Lake has made significant improvement in fire protection and that fire hazards are well managed through on-site fire response systems. Rabbit Lake continues to make adequate provision for the protection of the environment as well as the health and safety of persons.

3.12 Waste Management

Waste management activities at Rabbit Lake are described within the Rabbit Lake *Waste Management Program* (RAM-WMP). In accordance with the RAM-WMP, Cameco manages and disposes of wastes in compliance with our CNSC licence and provincial Approval to Operate as well as with applicable laws and regulations. Rabbit Lake disposes waste on site only when it cannot be practically reduced, reused, recycled, and/or recovered (4Rs). Quantities of wastes produced, recycled, stored and disposed of and the locations used for waste storage and disposal are tracked as part of the RAM-WMP.

The RAM-WMP applies to the management of tailings, waste rock, solid waste and liquid waste. A detailed breakdown of the waste types generated at Rabbit Lake and their storage or disposal location is provided in Table 3.12-1.

Table 3.12-1: Rabbit Lake waste types and storage locations.

Waste Type		Storage/Disposal Location
Tailings	Tailings from mining of the original Rabbit Lake orebody	AGTMF
	Tailings from mining of the A-Zone, D-Zone, B-Zone and Eagle Point orebodies	RLITMF
Waste Rock	Overburden from open pit mining of Rabbit Lake, A-Zone, D-Zone and B-Zone orebodies (till, organics, sandstone, non-mineralized basement rock)	East #5 Waste Rock Pile (consumed) North #5 Waste Rock Pile (reclaimed) D-Zone Pit D-Zone Waste Rock Pile (reclaimed) A-Zone Pit A-Zone Waste Rock Pile (reclaimed) B-Zone Pit B-Zone Waste Rock Pile (reclaimed) West#5 Waste Rock Pile
	Non-mineralized rock from Eagle Point development	Eagle Point Waste Rock Pile Eagle Point underground (as backfill)
	Mineralized waste rock	Mineralized Waste Stockpile #2 Mineralized Waste Stockpile #3 Mineralized Waste Stockpile #9 (consumed) Mineralized Waste Stockpile #36 B-Zone Ore Pad
Solid Waste	Non contaminated	Domestic landfill
	Potentially contaminated	AGTMF or RLITMF
	Cigar Lake potentially contaminated waste	AGTMF
	Hazardous substances and waste dangerous goods (HSWDG)	HSWDG storage units
	Recyclable or reusable materials	Temporary laydown areas
Liquid Waste	Potentially contaminated water	Treated through the mill WTP
	Sewage	

3.12.1 Discussion

3.12.1.1 Waste Management

When the mine is in operation, mineralized waste rock from the Eagle Point mine is temporarily stored on the Eagle Point ore pad and then trucked to the B-Zone ore pad for

sorting. Ore-grade material is sent to the Rabbit Lake mill for processing. Clean waste rock is stored at Eagle Point and is continuously used underground, largely for backfill.

Domestic wastes are managed within a dedicated landfill on-site adjacent to the West #5 WRP. A waste-ticketing system ensures proper handling, tracking and disposal of these wastes. During the current licence period, the Rabbit Lake operation undertook initiatives that reduced the overall amount of waste going to the landfill. Specific activities aimed at improving the management of waste and reducing the amount of waste sent to the domestic and contaminated landfills included the following:

- Continued application and expansion of the 4Rs program to reduce, reuse, recycle and recover materials used at the site.
- Conducting a site-wide inventory of materials that could be moved off site for sale or recycle.
- Continually improving, monitoring and measuring waste materials disposed of at Rabbit Lake by transitioning to an electronic system for entering and reporting waste data.
- Updating hazardous substance and waste dangerous good inventory management processes and storage locations.

During the transition to care and maintenance, the volume of material reporting to the domestic and contaminated landfills were significantly reduced. Waste volumes in 2021 were less than 5% of those disposed of in the most recent year of production (2015).

3.12.1.2 Progressive Reclamation

Rabbit Lake has a long history of progressively reclaiming areas of the site that are no longer required for future mining or milling activities (see Section 1.1.2.3). During the current licence term, the focus of progressive reclamation has been on the B-Zone WRP and AGTMF. An engineered cover system was constructed on the B-Zone WRP and vegetated from 2011 to 2013. Rabbit Lake is currently monitoring the ongoing performance of the cover system with the most recent performance report submitted in 2021 covering performance from 2016 to 2019. The results from the recent performance monitoring, specifically, the calculated net percolation through the cover, have been incorporated into the 2020 ERA and shows that human health and the environment in the vicinity of Rabbit Lake remain protected and that Rabbit Lake remains within the objectives of the established licensing basis. Ongoing revegetation of the B-Zone WRP as well as reclaimed mining areas at D-Zone and A-Zone during the licence term have included planting of approximately 28,000 native trees and shrubs.

In regard to the AGTMF, the northern portion of the facility continues to be used for management of contaminated wastes. However, in 2012, Rabbit Lake commenced initial progressive reclamation activities on the unused southern portion of the AGTMF. This area was graded and covered with a minimum 1 m thickness of till in accordance with the approved grading plan and the area was subsequently hydroseeded from 2013-2015.

3.12.2 Future Plans

Rabbit Lake will continue to evaluate the performance of the B-Zone WRP cover system in the next licence term. Rabbit Lake is also evaluating the potential to progressively reclaim the B-Zone Pond by removing the cofferdam and earthen abutments, reincorporating the area into Collins Bay, similar to the process that was successfully executed for the former A-Zone and D-Zone mining areas.

3.12.3 Conclusions

The RAM-WMP is effective in ensuring volumes of waste material are being reduced wherever possible and that all waste generated is being handled in a way that is protective of the environment. Further, Rabbit Lake has completed and remained committed to progressive reclamation in areas of the site that are no longer required for future mining or milling activities. In the management of waste, Rabbit Lake has adequately protected the environment as well as the health and safety of persons.

3.13 Security

The Rabbit Lake *Security Program* (RAM-SP) is designed to prevent the loss or theft of nuclear materials and substances and to prevent the interference of safe activities at the site.

3.13.1 Discussion

Specific to the RAM-SP, Cameco conducts Threat, Risk and Vulnerability assessments (TRVA) to ensure appropriate security measures are taken for potential threats. The TRVAs are completed in accordance with the International Atomic Energy Agency document *Nuclear Security in the Uranium Extraction Industry*. The objectives of the TRVA are to:

- Identify important material and sensitive information that needs protection.
- Identify and assess potential threats to the materials and information.
- Assess the risks associated with each threat to determine the estimate probability of occurring and potential consequences.
- Identify existing vulnerabilities and opportunities for mitigation to reduce residual risk.

The scope of the TRVA includes all key processes at Rabbit Lake. The TRVA also includes a general assessment of the security measures. The assessment methodology consists of a review of security procedures, observations of security measures and discussions with select Rabbit Lake employees. A hazard/risk list is compiled and maintained by Rabbit Lake as per the RAM-QMP. The most recent TRVAs for Rabbit Lake was completed in 2017 and noted that, due to the remote nature of the operation, the

security risk is considered low and that current security measures are sufficient to address the current threat level.

3.13.2 Future Plans

Rabbit Lake does not foresee any significant changes to the management of security at the site in the next licence term.

3.13.3 Conclusions

During the current licence term, there were no incidents or significant security-related issues. The RAM-SP and security measures in place at Rabbit Lake remain adequate and are expected to remain adequate for the upcoming licence period.

3.14 Safeguards and Non-proliferation

Rabbit Lake meets obligations arising from the *Canada-International Atomic Energy Agency Safeguards Agreement* through the RAM-MFLM and the *Access Procedures Under the Additional Protocol*.

3.14.1 Discussion

In carrying out the licensed activities, Rabbit Lake makes adequate provision for the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Conditions for the application of International Atomic Energy Agency (IAEA) safeguards are contained in the operating licence and criteria in order to meet the conditions contained in the LCH and in CNSC REGDOC-2.13.1, *Safeguards and Nuclear Material Accountancy*. Cameco reports production results in detail on an annual basis to the CNSC in accordance with international requirements.

3.14.2 Future Plans

Rabbit Lake will continue to ensure Canada’s international obligations to safeguard nuclear materials are being met during the next licence term.

3.14.3 Conclusions

Rabbit Lake continues to ensure Canada’s international obligations to safeguard nuclear materials are being met.

3.15 Packaging and Transport

The Rabbit Lake *Transportation Program* (RAM-TP) applies to the activities required to manage transportation activities at Rabbit Lake. The RAM-TP details the methods and

practices that are utilized for transportation of bulk commodities, freight, and waste materials to and from Rabbit Lake.

3.15.1 Discussion

During the current licence term, Rabbit Lake has safely and effectively managed the transportation of bulk commodities, freight and waste materials to and from site. There was one incident involving transport of uranium concentrate from Rabbit Lake during the current licence term. In accordance with Cameco's corrective action process, this incident was investigated, and Cameco put in place corrective actions.

In December 2013, during a routine inspection of a Rabbit Lake uranium concentrate shipment at the Saskatoon transit warehouse, it was discovered that product was on the floor of the trailer as the result of a damaged drum. The trailer was immediately locked and isolated while the appropriate Cameco personnel were notified. The product was cleaned up and the drum was placed into an over pack for safe shipment to Cameco's Blind River Refinery. Cameco initiated an investigation in response to this event and implemented appropriate corrective actions. These corrective actions included: investigation of a more appropriate drum handler in order to reduce the risk of puncturing drums; review and update warehouse work instructions related to uranium concentrate handling; review and update the inspection protocols; review and update the training plan for warehouse personnel; and completion of skills evaluations in accordance with the updated training plan.

3.15.2 Future Plans

The RAM-TP supports the safe packaging and transportation of bulk commodities, freight and waste materials and remains protective of the environment and the health and safety of persons.

3.15.3 Conclusions

The RAM-TP ensures the shipment of transportation of bulk commodities, freight, uranium concentrate and waste materials to and from Rabbit Lake remains protective of the environment and the health and safety of persons.

4.0 Other Matters of Regulatory Interest

4.1 Indigenous Engagement

Cameco recognizes the rights of Indigenous Peoples, to be consulted and, where applicable, to have their interests accommodated by the Crown with respect to any activities associated with CNSC-licensed operations and projects that could potentially impact the exercise of Indigenous or treaty rights. Cameco assists the CNSC in the discharge of Indigenous consultation and accommodation obligations where they arise. The Crown's duty to consult and accommodate aligns with Cameco's corporate values, commitments and measures of success and as such constitutes sound business practice.

As the majority of northern Saskatchewan residents are of Indigenous origin, including First Nations and Métis, Cameco's public engagement activities relating to Rabbit Lake also provide opportunities for the Province of Saskatchewan and the CNSC to effectively consult with Indigenous Peoples in northern Saskatchewan. Rabbit Lake's engagement process is described, in detail, within the RAM-PIP.

4.2 Public Information Program

Consistent with Cameco's vision, mission and values and measures of success, the objective of the RAM-PIP is to ensure local target audiences with an interest in Rabbit Lake are informed on a timely basis about operations, activities and anticipated effects on the environment and the health and safety of persons, to elicit feedback and provide meaningful response, and thereby build the trust and support of stakeholders.

The primary audience for the RAM-PIP is the rights-bearing First Nation and Métis communities and municipalities of the Athabasca Basin that are located in the vicinity of the site. Specifically, these communities are:

- Black Lake Denesųłiné First Nation.
- Fond du Lac Denesųłiné First Nation.
- Hatchet Lake Denesųłiné First Nation.
- Northern Settlement of Camsell Portage.
- Northern Hamlet of Stony Rapids.
- Northern Settlement of Uranium City.
- Northern Settlement of Wollaston Lake (the adjoined communities of Hatchet Lake and Wollaston are located closest to the Rabbit Lake Operation.

Cameco and Orano have a longstanding history of collaboration, building relationships and maintaining commercial arrangements with these First Nation and Métis communities and municipalities. In 1999, Cameco and Orano signed an Impact Management Agreement (IMA) with these communities that included:

- Preference for hiring residents of the Athabasca Basin communities for Cameco and Orano operations and the establishment of employment goals in consultation with the communities.
- Providing career awareness programs and scholarship funding.
- Preference for community-owned businesses in meeting the service requirements for Cameco and Orano operations.
- Investing in community projects and priorities.
- Ongoing community engagement and environmental stewardship.

In 2016, Cameco and Orano signed a confidential Collaboration Agreement (CA) collectively with these communities known as the Ya'thi Néné Collaboration Agreement. The agreement builds on the 1999 IMA and is the primary agreement with the Athabasca Basin communities associated with Rabbit Lake. The CA reinforces prior benefits and is structured on the pillars of workforce development, business development, community investment and community engagement and environmental stewardship.

Since the CA was signed, Cameco and Orano have continued to provide significant funding for workforce development, community investment and business development initiatives for the Athabasca Basin. As of the end of 2021, more than $84 million has been invested in workforce development, including salaries for Athabasca Basin members. At the end of 2022, there were 97 people from the Athabasca Basin employed with Cameco. Specifically, at Rabbit Lake, approximately 30% of the current workforce (26 employees) are from the Athabasca Basin. Despite recent workforce reductions throughout Saskatchewan, Cameco has maintained Athabasca Basin employment at our operations. In addition to the benefits that flowed under the 1999 IMA previously, more than $28 million has been invested in Athabasca Basin communities and over $592 million spent with eligible Athabasca Basin owned businesses since the CA was signed in 2016. This exceeded the 5-year target of $250 million that was established in the CA under the business development pillar of the agreement.

Engagement between Cameco and the communities under the CA occurs primarily through the Athabasca Joint Engagement and Environment Subcommittee (AJES), a joint committee of community and industry representatives that meets regularly to discuss operational and environment-related matters of importance to the communities and provides a channel for the communities to share traditional knowledge with the companies. In addition, the Ya'thi Néné Land and Resource Office was established under the terms of the CA to provide support to the subcommittee and the executive director is an AJES member. The office has become a point of contact for the communities.

In addition to engaging with the Métis people in the vicinity of our operations through our CA, Cameco also works with the Métis Local Presidents of the Uranium City Métis Local #50 and the Stony Rapids Métis Local #80. Cameco employees and long-term contractors at Rabbit Lake, about half of which are residents of northern Saskatchewan, are also part of the primary target audience for the RAM-PIP.

While the rights-bearing First Nation and Métis communities under the CA, local Métis people and Cameco employees and long-term contractors are the primary audience for the RAM-PIP, Cameco considers the general public of the Northern Administrative District (NAD) and the Province of Saskatchewan generally to be a secondary audience. Cameco provides information and responds to inquiries from the NAD communities and other organizations or groups such as the Northern Saskatchewan Environmental Quality Committee (NSEQC) that may express interest in Rabbit Lake through our websites and social media channels and direct engagement when appropriate.

Cameco engagement activities are guided by a set of principles that were developed through roundtable consultation with northern opinion leaders. These principles are:

- Open Channels for Communication
- Make it Simple
- Build Capacity for Understanding
- Hear the Elders
- Include Youth
- Speak and Hear Our Languages

These principles guide Cameco's communication and engagement efforts in northern Saskatchewan. Face to face engagement is Cameco's preferred process for engagement as it provides the best measure of the perceptions and opinions of the target audience. These engagement activities include meetings and events in stakeholder communities and at our operations, including tours and technical workshops. However, in response to COVID, Cameco has also conducted recent engagement through virtual means. Other methods of engagement utilized by Rabbit Lake include conventional media, social media and polling.

Additionally, Rabbit Lake maintains a Public Disclosure Protocol that was developed in accordance with guidance provided by the CNSC. The Public Disclosure Protocol describes the types of routine and non-routine information that Cameco is committed to providing to target audiences. The Public Disclosure Protocol is posted on Cameco's northern community website [3].

During the licence term, Rabbit Lake has continued to show the commitment to conducting engagement activities in accordance with the RAM-PIP. Engagement activities have focused on providing members of the public with ongoing updates on the site through presentations, including discussion on the surface and underground activities.

In all, over 94 specific engagement events were held in the current licence term with northern Saskatchewan communities in relation to Rabbit Lake activities, among other matters. A summary of these events is provided each year in the Rabbit Lake annual report.

Specific to this licence application, Rabbit Lake undertook engagement activities beginning in 2021 to make target audiences aware of the upcoming licence renewal and provide opportunities to communicate any concerns. Updates were conducted primarily through regular quarterly AJES subcommittee meetings in accordance with the RAM-PIP. However, Cameco also took the opportunity, when available, to discuss relicensing at scheduled NSEQC meetings and during regular subcommittee meetings under the English River First Nation, Pinehouse Lake, and Lac La Ronge Indian Band Collaboration Agreements. Cameco also created a dedicated webpage, specific to relicensing, for posting of key information [4].

In August 2022, CNSC staff, AJES and community members attended a site visit at Rabbit Lake where they were provided the opportunity to tour the site and raise any questions or concerns. Cameco and CNSC staff also attended meetings within the Athabasca Basin communities (Uranium City, Black Lake, Stony Rapids, Fond du Lac and Wollaston Lake) from November 21-23, 2022, as part of relicensing-specific engagement. These community meetings enabled leadership as well as the general public to engage in open discussions with Cameco and CNSC staff in regard to Cameco's requested licence renewal.

4.3 Eastern Athabasca Regional Monitoring Program

The Eastern Athabasca Regional Monitoring Program (EARMP) was established in 2011 under the Province of Saskatchewan's Boreal Watershed Initiative. The program is supported by contributions from several stakeholders, including the SMOE, CNSC, Cameco and Orano. The EARMP was designed to identify potential cumulative effects downstream of uranium mining and milling operations in the Eastern Athabasca region of northern Saskatchewan. The community-based component of the program partners with communities to monitor the safety of traditionally harvested country foods by collecting and testing representative water, fish, berry and mammal tissue samples from the seven communities located in the region.

Harvesting and consuming traditional foods are an important part of the culture in northern Saskatchewan, which contributes to an overall healthy lifestyle through physical activity and healthy eating. Community members play a key role in the program, as local knowledge is used to determine locations for the water, fish, berries and mammal samples. Locations focus on areas where community members routinely fish, hunt, and gather. Samples are then collected by, or with the aid of, community members.

As part of the 2018 EARMP program, an updated Human Health Risk Assessment was completed using all water chemistry and country foods chemistry data collected from the previous seven years in the region. The results of the assessment indicated that the consumption of local water and country foods did not present health risks to Athabasca Basin residents and was safe for consumption.

The 2021/2022 program results continue to show that country foods are safe for consumption with chemical profiles for water, fish, berry and mammal tissue samples similar to previous monitoring years and natural background.

The EARMP collected and tested over 850 water and traditional food samples from the Athabasca Region from 2011 to 2021. Results indicate that the measured concentrations in the samples are similar to baseline levels and the regional reference range, and those used in the 2018 Human Health Risk Assessment.

Results from ten years of sampling have consistently demonstrated that water and traditional foods remain safe for consumption, and that they continue to be a safe and healthy dietary choice for residents of the Athabasca Basin. The 10-year summary report, annual reports and data from the programs conducted to date are publicly available at www.earmp.ca.

4.4 Community Based Environmental Monitoring Program

Building off eighteen years of data collected through the Athabasca Working Group (AWG) Environmental Monitoring Program (which was a product of the original Impact Management Agreement that Cameco signed in 1999 with northern First Nations and communities), the program was enhanced in 2018 to create a Community Based Environmental Monitoring Program (CBEMP) for the Athabasca region. The new CBEMP allows community members to become more involved and provide input to steer the direction of the program in their particular community. The program focuses on individual communities within the region on a rotating basis.

The overall study objective of the CBEMP is to gain an understanding of traditional food use by community members and to assess if these foods remain safe for consumption. The involvement of community members is one of the fundamental aspects of the study. The study obtained information regarding the quantity, type and harvest location of traditional foods through community interviews. To accomplish these objectives, a Traditional Food Frequency Questionnaire is developed in collaboration with community leadership and band members are hired and trained to conduct interviews with community residents.

In 2020/2021, the CBEMP completed a traditional food study within the community of Hatchet Lake Denesųłiné First Nation (Hatchet Lake) and Wollaston Lake. Traditional meat that was predominantly harvested included barren ground caribou (meat and organs) and moose. Barren-ground caribou was consumed by all participants interviewed and made up over 50% of the community's traditional foods diet. The most common fish species consumed were lake whitefish, lake trout, northern pike, and walleye. The most frequently consumed birds were spruce grouse, Canada goose, and Common Merganser. The most common berry types consumed were blueberry and bog cranberry. The consumption frequency and quantities reported were generally consistent with other First Nations communities surveyed within Canada and slightly lower than other First Nations in northern Saskatchewan.

The results of the study continue to show harvesting and eating traditional foods are integral components of good health among those living in Hatchet Lake and Wollaston Lake and the chemical analysis of the common traditional foods from the communities

demonstrate that regularly eating locally collected fish, meat, berries and plants is not a cause for concern.

The study was also completed in Black Lake Denesųłiné First Nation and Stony Rapids in 2018/2019 and Fond du Lac Denesųłiné First Nation in 2019/2020. These studies came to the same conclusion as the recent Hatchet Lake and Wollaston Lake CBEMP study. Most recently, the study took place in Uranium City and Camsell Portage in 2021/2022, with an increased involvement from the Ya'thi Néné Land and Resource Office, and results are expected in 2023.

4.5 Cost Recovery

Cameco is in good standing with the CNSC regarding licensing fees for Rabbit Lake.

4.6 Decommissioning and Financial Guarantees

4.6.1 Preliminary Decommissioning Plan and Cost Estimate

The Rabbit Lake *Preliminary Decommissioning Plan* (RAM-PDP) describes, at a high level, the approach that would be undertaken to decommission Rabbit Lake under a hypothetical "decommission tomorrow" scenario in the unlikely event that Cameco becomes insolvent and cannot fulfill its decommissioning obligations. The methodologies described within the RAM-PDP align with those approved through previous environmental assessments and form the basis for the accompanying *Preliminary Decommissioning Cost Estimate* (RAM-PDCE). The RAM-PDCE provides an estimate of the present value of the decommissioning cost, in accordance with the methodologies described within the RAM-PDP and forms the basis for the financial guarantee for Rabbit Lake. A summary of the current RAM-PDP and RAM-PDCE are posted on the Cameco website [5].

In accordance with CNSC and SMOE requirements, the RAM-PDP and RAM-PDCE are updated at five-year intervals or when a significant change to the site may necessitate an update. The current approved RAM-PDP and RAM-PDCE were submitted in May 2018 and are inclusive of any anticipated activities at Rabbit Lake to the end of 2023 in accordance with the five-year period between reviews. Cameco submitted an updated PDP and PDCE in June 2020 to address regulatory comments, resulting in the current financial guarantee of $213.4 million. The revised financial guarantee was approved by the CNSC through a Public Hearing in Writing in March 2021. Rabbit Lake currently has financial instruments in place for the full amount of the approved financial guarantee.

Cameco submitted updated PDP and PDCE documents for Rabbit Lake in December 2022 for regulatory review in accordance with the required 5-year review cycle. The recent documents were prepared in accordance with updated compliance verification criteria documentation:

- CSA N294-19, *Decommissioning of Facilities Containing Nuclear Substances*

- CNSC REGDOC-2.11.2, *Decommissioning*
- CNSC REGDOC-3.3.1, *Financial Guarantees for Decommissioning of Nuclear Facilities and Termination of Licensed Activities*.

Currently, Rabbit Lake is working with the CNSC and SMOE to address any comments and will submit final documents for acceptance. It is anticipated that the revised financial guarantees will be the subject of a CNSC Public Hearing in Writing.

4.7 Other Regulatory Approvals

SMOE provides approvals in accordance with *The Environmental Management and Protection Act, 2010* of Saskatchewan and all associated regulations to assure mineral industrial operations are operated and managed in accordance with provincial legislation. On January 31, 2022, Cameco received an updated Approval to Operate Pollutant Control Facilities (PO22-002), from SMOE that expires June 30, 2028. This document provides approval from SMOE to operate facilities such as the water treatment plant, tailings management facilities, the domestic and contaminated landfill and the hazardous substance and waste dangerous goods storage facilities.

5.0 Conclusions

Rabbit Lake has demonstrated strong performance in all SCAs throughout the current licence term with a demonstrated commitment to continuous improvement in our quality management system. Through nearly 50 years of operation, Rabbit Lake's management system programs have evolved to meet all current regulatory requirements and enable Cameco to safely conduct licensed activities at Rabbit Lake either in care and maintenance or while mining and milling uranium ore.

During the recent period of safe care and maintenance, Rabbit Lake has focussed on managing existing assets to safely execute licensing activities. Should a decision be made to resume production at a future date, Rabbit Lake would develop necessary plans and take appropriate measures to ensure that all infrastructure necessary for mining and milling of uranium ore is operationally ready. Recently, Cameco developed and executed an operational readiness plan for safe restart of our McArthur River and Key Lake operations. If a decision is made to resume mining and milling of uranium ore at Rabbit Lake, the focus of the restart activities would be on the development of a robust commissioning plan detailing the activities planned for preparation of the mine and mill for return to operations.

Based on our performance during the current licence period, Cameco has demonstrated that we are qualified to carry out all licensed for a proposed 20-year licence term and will, in doing so, continue to make the necessary provisions for the protection of the environment as well as the health and safety of persons.

References

Documents referenced in this CMD.

1. Cameco Corporation and AREVA Resources Canada Inc. 2008. Rabbit Lake Solution Processing Project Environmental Impact Statement. January.
2. Technical Reports - Public Summary. Rabbit Lake Operation Environmental Risk Assessment. https://www.cameco.com/uploads/downloads/Rabbit-Lake-ERA-Public-Summary.pdf
3. Public Disclosure Protocol for Cameco Northern Operations. https://www.cameconorth.com/about/public-disclosure
4. Licence Renewal - Rabbit Lake - Suspended - Uranium Operations - Businesses - Cameco
5. Preliminary Decommissioning Plan and Cost Estimate Summary – Rabbit Lake Operation. https://www.cameco.com/uploads/downloads/relicensing_rabbit_lake/Rabbit_Lake_PDP_Summary.pdf