



Cigar Lake Operation Licence Renewal

CNSC Staff Presentation



Commission Hearing
April 28 and 29, 2021
CMD 21-H2.A





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Presentation Outline

- Purpose of Hearing
- Facility Overview
- Review of Licence Application
- Regulatory Oversight
- Performance Assessment
- Other Matters of Regulatory Interest
- Licence and Licence Conditions Handbook (LCH)
- Conclusions and Recommendations



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Errata

Figure 3.1, page 30 of staff's CMD:

The maximum individual dose for 2018 should be 7.28 mSv

***No impact on staff's assessment of
the Radiation Protection Program***



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Purpose of Hearing

Cameco has applied to the Commission to:

- Renew Cameco's Cigar Lake operating licence for a period of 10 years

CNSC staff recommend that the Commission:

- Renew the proposed operating licence, UML-MINE-CIGAR.00/2031 until June 30, 2031
- Delegate authority as set out in CMD 21-H2



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FACILITY OVERVIEW



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Facility Overview Aerial View

- Underground
- Surface and support facilities
- Ore produced is trucked to Orano's McClean Lake mill for processing (~70 km)





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Facility Overview

Cigar Lake Timeline

- 1980's to 1990's – Exploration and test mine
- 2004 – Construction licence issued
- 2013 – Current licence issued
- 2014 – First ore mining
- 2015 – Full production
- Estimated life of mine 15 years from initial production
- Decommissioning 14 years after production ends



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Facility Overview

Cigar Lake CNSC Licence

- Last renewed July 2013 (amended in November 2020 to update the Financial Guarantee), valid until June 30, 2021
- Authorizes Cameco to:
 - Prepare, construct, operate, modify and decommission
 - Mine a nuclear substance (uranium ore)
 - Import, possess, use, store, transfer, and dispose of nuclear substances, radiation devices, and equipment
- Proposed 10 year licence, valid until **June 30, 2031**

*No
changes
requested
to
authorized
activities*



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REVIEW OF LICENCE APPLICATION



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CNSC's Review of the Licence Application

Renewal application submitted **November 18, 2019**,
for a 10 year term. No new activities proposed.

CNSC staff assessed:

- Regulatory requirements, including the *Nuclear Safety and Control Act* (NSCA), associated regulations, guides and standards for all **14 safety and control areas (SCAs)**
- Cameco's past performance and record (compliance activities and environmental monitoring)
- Cameco's public information, community outreach, and consultation activities

*CNSC staff
conclude Cameco
meets licensing
requirements*



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Review of Licence Application

Environmental Protection Review under the NSCA

- CNSC staff conducted an Environmental Protection Review (EPR) under the *Nuclear Safety and Control Act* (NSCA) for the licence renewal
- The EPR assessed the environmental and health effects of the Cigar Lake Operation
- CNSC staff's assessment was based on information submitted by Cameco, as well as compliance, technical assessment, and independent verification activities conducted by CNSC staff
- The EPR is appended to, and supports the recommendations in, CNSC staff's CMD 21-H2

CNSC staff conclude Cameco has made, and will continue to make, adequate provision for the protection of the environment and the health of persons



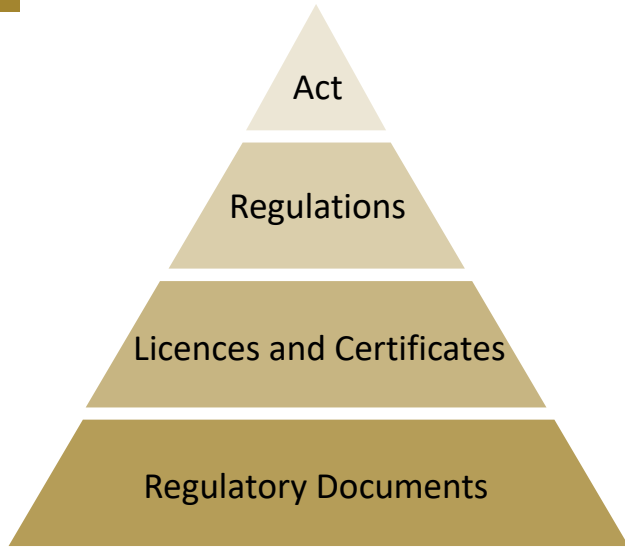
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REGULATORY OVERSIGHT



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Regulatory Oversight



- *Nuclear Safety and Control Act (NSCA)* and associated Regulations
- **Commission licensing requirements:**
 - Licence conditions
 - CNSC regulatory documents
 - Canadian Standards Association (CSA) Group standards
- CNSC staff's ongoing compliance activities include verification, enforcement, and reporting
- Compliance verification criteria are included in the licence conditions handbook

*Clear and robust safety focused
regulatory framework*



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Regulatory Oversight

Licensing and Compliance Activities

Year	2013	2014	2015	2016	2017	2018	2019	2020	Total
Number of inspections	4	5	6	6	6	6	6	5 (updated)	44

- 44 inspections conducted from January 1, 2013 to December 30, 2020
- Compliance verification activities include:
 - Desktop reviews (monthly, quarterly, annual reports and licensee’s applications)
 - Event notifications
 - Follow up reports (with corrective actions)
 - Inspections



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Regulatory Oversight Compliance Inspections

- Inspections conducted - covered all 14 SCAs
- No safety-significant non-compliances identified
- Issues identified were corrected in a timely manner
- Non-compliances tracked by CNSC staff using the CNSC Regulatory Information Bank



CNSC staff checking berm and ditch conditions – Waste Rock Stockpile B
(Photo source: CNSC)

***CNSC staff verify completion of corrective actions
as part of ongoing regulatory oversight***



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Regulatory Oversight

Event Reporting

Licensees must report all events as required by the NSCA, associated Regulations and licence conditions.

- Cameco provided 51 reportable event notifications
 - One Event Initial Report presented to the Commission as CMD 16-M58 was a result of a wolf attack at Cigar Lake
 - Lost Time Injuries and Action Level exceedances are reported in the annual regulatory oversight report
 - All environmental event reports were rated low significance
- Cameco's event notifications and follow up reports were acceptable to CNSC staff
- Cameco proactively disclosed reportable events on their website as required

***CNSC staff
conclude Cameco
met regulatory
event reporting
requirements
during the current
licence period***



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PERFORMANCE ASSESSMENT



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Performance Assessment

Safety and Control Area Performance

- Regulatory oversight is performed in accordance with a standard set of safety and control areas (SCA's)
- SCA's are used across all CNSC regulated facilities and activities
- Cameco maintained a satisfactory rating across all SCAs during the current licence period

Risk-informed and performance-based approach



Safety and Control Areas	Rating 2013-2020
Management system	SA
Human performance management	SA
Operating performance	SA
Safety analysis	SA
Physical design	SA
Fitness for service	SA
Radiation protection	SA
Conventional health and safety	SA
Environmental protection	SA
Emergency management and fire protection	SA
Waste management	SA
Security	SA
Safeguards and non-proliferation	SA
Packaging and transport	SA



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Performance Assessment

Safety and Control Area Performance Highlights

- The assessment of all 14 SCAs is detailed in CMD 21-H2
- Four SCAs are highlighted in this presentation:
 - Management system
 - Radiation protection
 - Conventional health and safety
 - Environmental protection



Air sampling at the Cigar Lake Operation (Photo source: Cameco)



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Performance Assessment Management System

- Cameco is required to implement and maintain a management system in accordance with CSA N286-12
- CNSC staff monitor implementation of the management system through desktop reviews, meetings with Cameco and site compliance inspections

CNSC staff conclude Cameco's management system meets regulatory requirements



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Performance Assessment

Radiation Protection

- CNSC staff verified Cameco's radiation protection (RP) program meets the *Radiation Protection Regulations* through:
 - Effective implementation of an RP program
 - Ascertaining and recording doses to workers
 - Ensuring no exceedances of prescribed dose limits
- CNSC staff verified Cameco's RP program is mature and effective in protecting workers

CNSC staff conclude Cameco's RP program meets regulatory requirements



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Performance Assessment

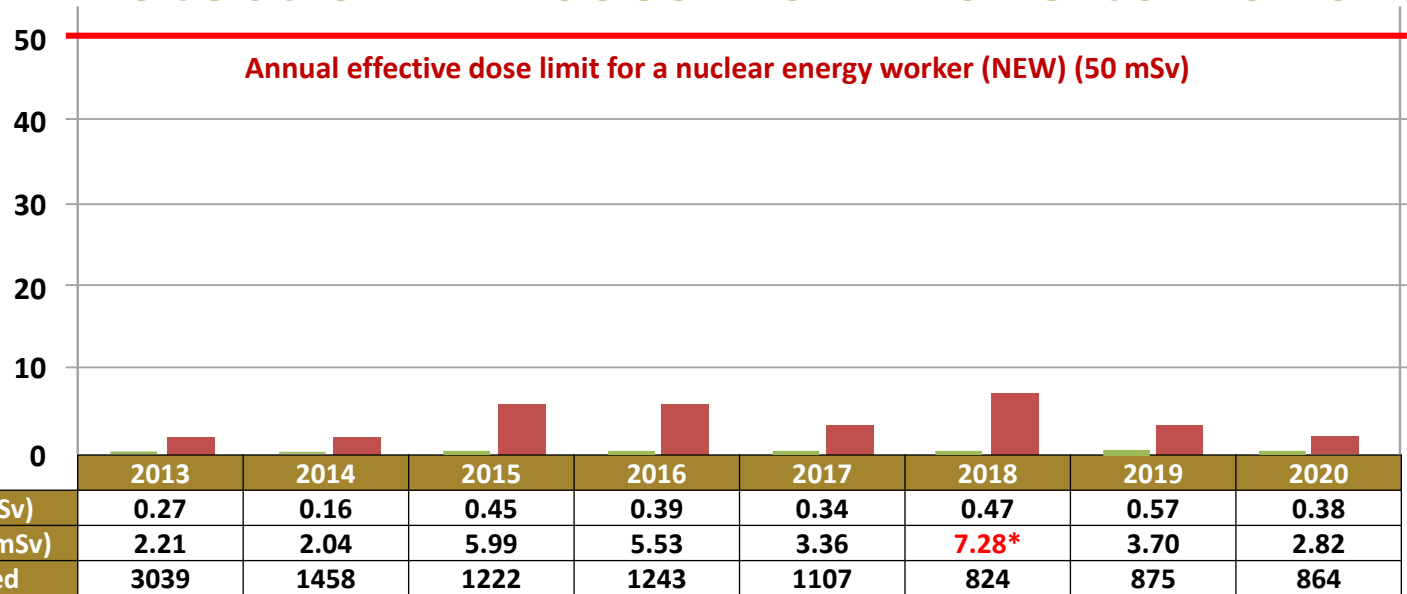
Radiation Protection – Doses from 2013 to 2020

Dose (mSv)

Annual effective dose limit for a nuclear energy worker (NEW) (50 mSv)

***7.28 mSv**

is associated with the dose for an unplanned exposure event



Nuclear Energy Worker (NEW) exposures continue to be below regulatory limits



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Performance Assessment

Radiation Protection – Action Levels

Action level exceedances may indicate a potential loss of control in the licensee’s radiation protection program.

Action Levels	Number of Reported Action Level Exceedances								
	Period	2013	2014	2015	2016	2017	2018	2019	2020
1.0 mSv/week	Weekly Action Level	0	0	0	0	0	5 ¹	0	1
5.0 mSv/quarter	Quarterly Action Level	0	0	0	0	0	2 ²	0	0

1 Weekly action level exceedances – 4.35, 1.18, 1.63, 1.48 and 1.12 mSv.

2 Quarterly action level exceedances – 5.17 and 5.08 mSv.

No worker has exceeded the annual or 5-year regulatory limit

Cameco has implemented an effective ALARA program



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Performance Assessment

Conventional Health and Safety (1/2)

- CNSC staff and Saskatchewan Labour Relations and Workplace Safety inspectors conduct regular inspections on health and safety
- CNSC staff verified Cameco has been proactive in identifying and managing risks to improve safety performance

Cameco's health and safety program continues to improve and remains effective



Emergency shower area (Photo source: CNSC)



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Performance Assessment

Conventional Health and Safety (2/2)

Year	2013	2014	2015	2016	2017	2018	2019	2020
Number of LTIs	4	1	4	1	0	0	0	0
LTI Frequency	0.25	0.12	0.56	0.14	0	0	0	0
LTI Severity	5.57	0	18.04	2.42	0	0	0	0
TRIF	5.23	2.52	2.38	2	1.58	1	1.67	2.08

- A lost time injury (LTI) is an injury that takes place at work and results in the worker being unable to return to work for a period of time
- Total recordable injury frequency (TRIF) includes all medical aids

Cameco's conventional health and safety program meets regulatory requirements



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Performance Assessment

Environmental Protection (1/4)

- CNSC staff assessed:
 - The 2017 ERA and confirmed the predicted impacts of the Cigar Lake Operation
 - Environmental monitoring program results and confirmed the environment and human health remains protected
- Cameco's environmental protection program protects the environment and the public in accordance with regulatory requirements

CNSC staff conclude Cameco's environmental protection program continues to be effective in protecting the environment and minimizing adverse impacts to human health



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Performance Assessment

Environmental Protection (2/4)

During the licensing period:

- Monthly mean concentrations of treated effluent released to the environment were monitored, meeting effluent discharge limits stipulated by CNSC and the *Metal and Diamond Mining Effluent Regulations*
- Concentrations of contaminants in the effluent remained low and below effluent discharge limits



Seru Bay, discharge point (Photo source: CNSC)

***Treated effluent concentrations
remain well below licence limits***



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Performance Assessment

Environmental Protection (3/4)

Action Level:

- Indicator to determine if there is a potential loss of control of the licensee's environmental protection program
- Cigar Lake updated environmental action levels to meet CSA standard
- September 2020, CNSC staff accepted the environmental action levels as proposed by Cigar Lake

There were no action level exceedances at the Cigar Lake Operation during the licence term



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Performance Assessment

Environmental Protection (4/4)

Arsenic, molybdenum, uranium and selenium:

- Concentrations increased in 2015 as predicted
- Process optimization techniques were investigated and implemented
- Concentrations have decreased and stabilized in subsequent years

There are effective measures in place to control and reduce arsenic, molybdenum, uranium and selenium in effluent



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OTHER MATTERS OF REGULATORY INTEREST



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Other Matters of Regulatory Interest

- CNSC's Independent Environmental Monitoring Program (IEMP)
- Eastern Athabasca Regional Monitoring Program (EARMP)
- Decommissioning
- Financial Guarantees
- Indigenous Engagement
- Public Outreach
- Participant Funding Program
- Interventions



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CNSC IEMP (1/3)

Cigar Lake sampling 2020:

- Consulted with Indigenous groups and incorporated their knowledge into the sampling plan
- Completed in September 2020
- Taken at reference locations not impacted by operations and exposure locations potentially impacted by operations
- Samples of surface water, fish, blueberries and Labrador tea collected in publicly accessible areas
- Analyzed for various metals and radionuclides



Collecting the Labrador tea sample from the west shoreline near the centre of Waterbury Lake.
(Photo source: CanNorth)



[CNSC's Independent Environmental Monitoring Program Website](#)

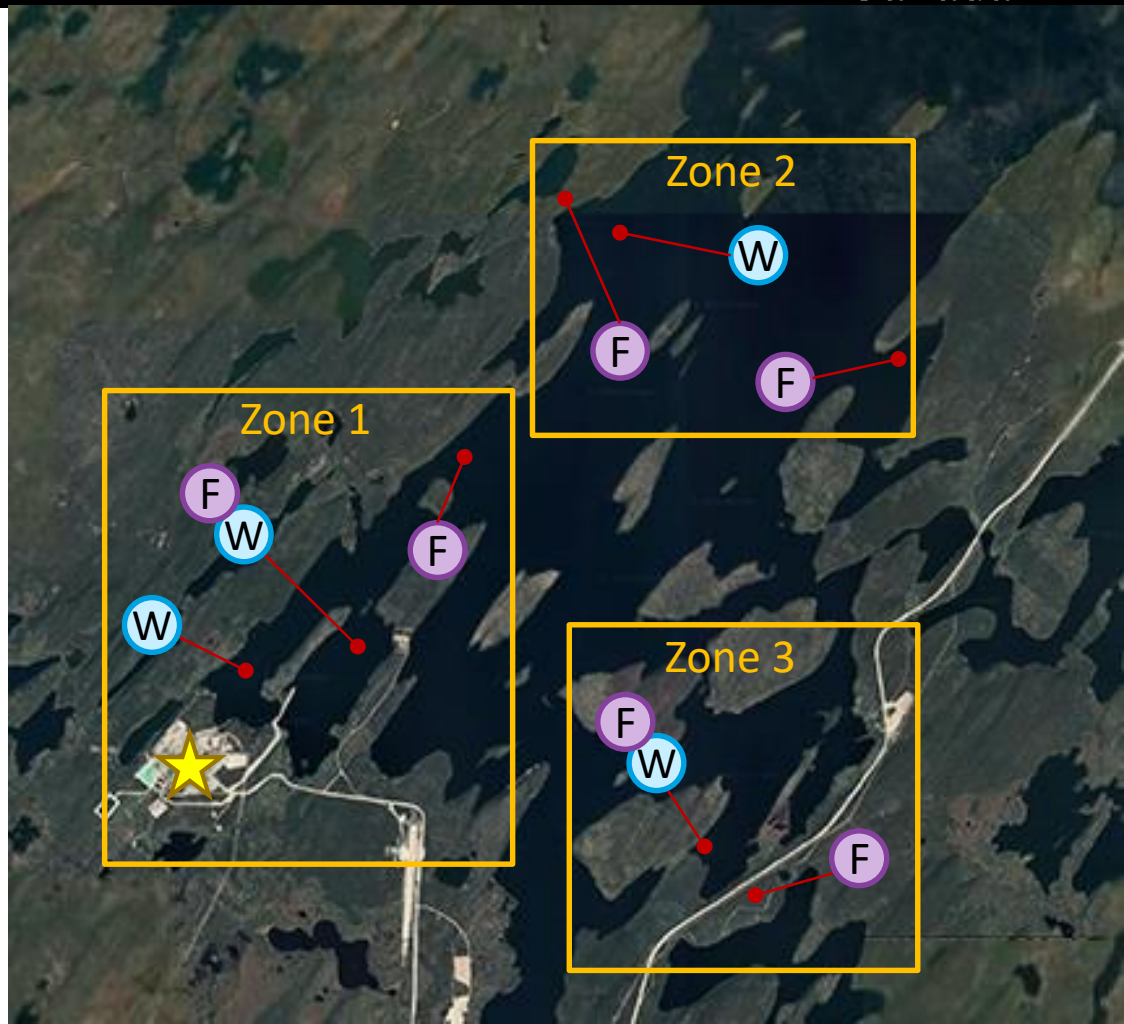


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CNSC IEMP (2/3)

Legend

- ★ Facility
- Sampling Station
- F Food Sampling
- W Water Sampling





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CNSC IEMP (3/3)

- IEMP results are consistent with Cameco's results
- Radioactivity levels similar in all samples at both the reference and exposure stations
- Concentration of selenium in some fish samples exceeded the CNSC screening levels
- Exceedances were not attributable to the Cigar Lake Operation
- All IEMP results are within the natural background levels for northern Saskatchewan

***The public and the environment are not impacted.
Fish, vegetation and water are safe for human consumption.***



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Eastern Athabasca Regional Monitoring Program

- Conducted annually, monitors the safety of traditionally harvested country foods
- Partnership of Indigenous communities, licensees and the Province of Saskatchewan
- Designed to evaluate the quality of country foods and identify potential cumulative effects downstream of uranium mining and milling operations
- Complementary activity to regulatory work by the CNSC and the Province of Saskatchewan
- Provides assurance that traditional local foods are safe to eat, the water quality is safe to drink, and the environment is protected

The EARMP concluded that there are no cumulative effects from legacy and operating uranium mines and mills in Saskatchewan



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Decommissioning

Cameco continues to maintain a Preliminary Decommissioning Plan (PDP) throughout the facility lifecycle:

- PDP is required by the Regulations, regulatory documents, and applicable standards
- PDP must be reassessed every 5 years at a minimum
- Next PDP is expected to be submitted in 2022



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Financial Guarantees

- Cameco is required to provide a financial guarantee in a form acceptable to the Commission
- In November 2020 the Commission accepted Cameco's revised estimated preliminary decommissioning cost from \$49.2M to \$61.8M
- Saskatchewan Ministry of Environment (SMOE) is the beneficiary of the financial guarantee

***Cameco's proposed FG is sufficient to complete
future decommissioning activities***



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Other Regulatory Matters

- Cameco complied with *CNSC's Cost Recovery Fees Regulations*
- The *Nuclear Liability and Compensation Act* does not apply to uranium mines and mills
- Cameco's Public Information and Disclosure Program meets the requirements of CNSC regulatory documents



Ore slurry truck entering ore receiving facility
(Photo source: Cameco)



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Public Outreach (1/2)

- Notice of public hearing was posted on the CNSC website, distributed to subscribers and advertised in print and digital media
- CNSC 101 was held in the Wollaston Post/Hatchet Lake First Nation communities in October 2016



CNSC staff presenting at Hatchet Lake First Nation Community
(Photo source: CNSC)



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Public Outreach (2/2)

- January 2017 - outreach session in the Wollaston Post/Hatchet Lake, Black Lake and Fond du Lac First Nation communities
- September 2019 - meetings in Prince Albert, SK
- September 2020 - video conference
- February 2021 - information sent to 23 Northern communities, targeting 4,642 addresses



CNSC staff presenting at meeting in Prince Albert, Saskatchewan (Photo Source: CNSC)



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Indigenous Engagement and Consultation

- CNSC staff engage with Indigenous groups through community meetings, workshops, tours and science fairs
- October 2020 - Letters of notification were sent to identified First Nation and Métis groups
- January 2021 - First Nation and Métis groups awarded funding through CNSC's Participant Funding Program
- February 2021 - Identified groups provided with a copy of CMD 21-H2
- March 2021 - Meetings with Ya' thi Néné Land and Resource Office

*The CNSC
continues to
engage with
Indigenous
peoples to build
trust and foster
relationships*



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Participant Funding Program

- The CNSC provided funding in the amount of \$109,000
- Funding was provided to assist members of the public and Indigenous groups in providing valuable information directly to the Commission

Funding Provided to:

- Canadian Nuclear Workers' Council
- English River First Nation
- Métis Nation-Saskatchewan
- Ya'thi Néné Land and Resource Office



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Interventions

- CNSC received 31 interventions
- Main themes included:
 - Support from local business and Indigenous persons and groups
 - Indigenous engagement and consultation
 - Length of licence period
 - Downstream water quality impacts



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LICENCE AND LICENCE CONDITIONS HANDBOOK



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Proposed Licence and Draft Licence Conditions Handbook

Proposed Cigar Lake Operating Licence:

- 10 year licence term
- Standard licence conditions

Draft Licence Conditions Handbook (LCH):

- Preamble
- Compliance verification criteria
- Guidance



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Proposed Licence Term

- Mature facility with established programs, effective management system and a history of regulatory compliance
- The requested 10 year term is consistent with CNSC licences issued to other uranium mines and mills and nuclear facilities across Canada
- CNSC staff report annually to the Commission and the public through the Regulatory Oversight Report
- CNSC staff will continue to provide regulatory oversight



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Regulatory Oversight

CNSC staff will continue to:

- Evaluate licensee performance across all SCAs
- Conduct inspections according to CNSC's compliance verification program
- Assess compliance reports, licensee programs and facility changes
- Verify and monitor licensee's implementation of CNSC regulatory documents in accordance with implementation plans
- Report annually to the Commission, in the form of a Regulatory Oversight Report



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CONCLUSIONS AND RECOMMENDATIONS



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Conclusions

CNSC staff have concluded the following *(with respect to paragraphs 24(4)(a) and (b) of the Nuclear Safety and Control Act)* **in that Cameco:**

- Is qualified to carry on the activities authorized by the licence
- Will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed



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Recommendations

CNSC staff recommend that the Commission:

- Renew the proposed operating licence, UML-MINE-CIGAR.00/2031 until June 30, 2031
- Delegate authority as set out in CMD 21-H2



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