

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Cameco Corporation

Subject Environmental Assessment Screening Report
for the Construction and Operation of the Cigar
Lake Uranium Mine Project

Date June 30, 2004

RECORD OF PROCEEDINGS

Applicant: Cameco Corporation

Address/Location: 2121-11th Street West, Saskatoon, Saskatchewan, S7M 1J3

Purpose: Environmental Assessment Screening Report for the Construction and Operation of the Cigar Lake Project

Application received: March 15, 2002

Date(s) of hearing: June 10, 2004

Location: Kikinahk Friendship Centre, 320 Boardman Street, La Ronge, Saskatchewan.

Members present: L.J. Keen, Chair A.R. Graham
C.R. Barnes M. J. McDill
J.A. Dosman

Counsel: K. Moore

Secretary: M.A. Leblanc

Recording Secretary: C. Taylor

Applicant Represented By	Document Number
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Intervenors	Document Number
See Appendix A	

Date of Decision: June 10, 2004

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1. Introduction

Cameco Corporation (Cameco) has applied to the Canadian Nuclear Safety Commission (CNSC¹) for approval to construct and modify the facilities at its Cigar Lake uranium mine in order to bring the mine into commercial operation. The Cigar Lake Project, which currently consists of test mine facilities, is located at the south end of Waterbury Lake, approximately 660 kilometres north of Saskatoon, Saskatchewan in the eastern part of the Athabaska Basin. In order to operate the Cigar Lake Project on a commercial basis, Cameco would have to obtain from the CNSC a Uranium Mine Construction Licence, followed later by a Uranium Mine Operating Licence.

Before proceeding with its consideration of the licence applications, the Commission considered a screening environmental assessment (EA) of the proposed project consistent with the requirements of the *Canadian Environmental Assessment Act (CEAA)*². This *Record of Proceedings* describes the Commission's consideration of the EA Screening Report and its reasons for decisions on the conclusions therein. For this EA under the CEAA, the CNSC and Human Resources and Skills Development Canada are the responsible authorities. The decisions of the responsible authorities are made separately³.

On June 25, 2003, following a public hearing on the matter, the Commission approved the *Environmental Assessment Guidelines (EA Guidelines)* for the screening EA⁴. The EA Guidelines defined the scope of the project and the scope of the factors to be considered in the EA. The EA Guidelines were used by CNSC staff in delegating to Cameco, pursuant to section 17 of the CEAA, the preparation of an Environmental Assessment Study Report (EASR) and technical study support documents. A draft of the EASR and support documents underwent a review by experts at the CNSC and other relevant federal and provincial government departments. The completed EASR was then used by CNSC staff in the preparation of the

¹ In this *Record of Proceedings*, the *Canadian Nuclear Safety Commission* is referred to as the "CNSC" when referring to the organization and its staff in general, and as the "Commission" when referring to the tribunal component.

² The Cigar Lake project was the subject of an Environmental Assessment Panel Review under the *Environmental Assessment and Review Process Guidelines Order (EARPGO)*; the Joint Federal-Provincial Review Panel submitted its recommendations on the proposal in 1997. However, the Federal Court trial decision of 2002 regarding the McClean Lake uranium mining project produced uncertainty regarding the transitional provisions of the CEAA for projects previously assessed under the EARPGO [see *Interchurch Uranium Committee Educational Co-operative v. Canada (Atomic Energy Control Board) and COGEMA Resources Inc.*, 2002 F.C.J. No. 1288]. CNSC staff therefore, at the request of Cameco, agreed that a new environmental assessment under the CEAA would be carried out for Cigar Lake Mining Project. The Federal Court of Appeal overturned the trial decision in its decision dated June 4, 2004 [see *Atomic Energy Control Board and COGEMA Resources Inc. v. Inter-Church Uranium Committee Educational Commission-operative*, 2004 FCA 218].

³ In May 2004, Human Resources and Skills Development Canada rendered its findings on the Screening Report and concluded that the project, taking into account the identified mitigation measures, is not likely to cause significant environmental effects.

⁴ Canadian Nuclear Safety Commission, August 29, 2003, *Record of Proceedings, Including Reasons for Decision, in the matter of Cameco Corporation, Environmental Assessment Guidelines (EA Scoping) for the Proposed Construction of a Mining Facility at the Cigar Lake Project*.

required Screening Report. The public and other stakeholders were provided an opportunity to review a draft Screening Report prior to its finalization and submission to the Commission for this hearing and decision. The Screening Report on the proposed construction and operation of the Cigar Lake Project is attached as Appendix 1 to CMD 04-H13.

Issues:

In considering the Screening Report, the Commission was required to decide:

1. whether the Screening Report is complete; that is, whether all of the factors and instructions set out in the approved EA Guidelines and subsection 16(1) of the CEAA were adequately addressed;
2. whether the project, taking into account the mitigation measures identified in the Screening Report, is likely to cause significant adverse environmental effects;
3. whether the project must be referred to the federal Minister of the Environment for referral to a review panel or mediator (i.e., pursuant to paragraph 20(1)(c) of the CEAA); and
4. whether the Commission will proceed with its consideration of an application for a licence under the *Nuclear Safety and Control Act*, consistent with paragraph 20(1)(a) of the CEAA.

Public Hearing:

The Commission, in making its decision, considered information presented for a public hearing held on June 10, 2004 in La Ronge, Saskatchewan. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*. During the public hearing, the Commission received written submissions and heard oral presentations from CNSC staff (CMD 04-H13 and CMD 04-H13.A) and Cameco (CMD 04-H13.1 and CMD 04-H13.1A). The Commission also considered oral and written submissions from 17 intervenors. See Appendix A to this *Record of Proceedings* for a detailed list of the interventions.

2. Decision

As noted above, the Federal Court of Appeal, on June 4, 2004, overturned the trial decision which had produced uncertainty regarding the transitional provisions of the CEAA. The Commission considers that, while a new environmental assessment of the Cigar Lake Project under the CEAA is not required in light of subsection 74(1) of the CEAA and the Federal Court of Appeal's decision [see 2004 FCA 218], the Commission, in any event, agrees with CNSC staff's conclusion that the project, taking into account the mitigation measures identified in the Screening Report, is not likely to cause significant adverse environmental effects.

Therefore, based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission decides that:

- a) the Screening Report is complete and meets all of the requirements set out in the approved EA Guidelines and subsection 16(1) of the CEAA;
- b) the project, taking into account the mitigation measures identified in the Screening Report, is not likely to cause significant adverse environmental effects;
- c) the Commission will not refer the project to the federal Minister of the Environment for his referral to a panel review or mediator; and
- d) consistent with paragraph 20(1)(a) of the CEAA, the Commission will consider a licence application from Cameco for the construction of the Cigar Lake Project.

3. Adequacy of the Hearing Process

The Commission considered the concerns expressed by some intervenors about the adequacy of the Commission's public hearing process.

The Environmental Quality Committee (EQC) – South Central Subcommittee, while indicating its appreciation to the Commission for holding the hearing in La Ronge, expressed the view that simultaneous translation in the Cree and Dene languages should have been available to facilitate a broader participation by the First Nation communities of northern Saskatchewan. The EQC – South-Central Subcommittee also expressed the view that funding from the CNSC would help facilitate effective participation in the process.

In response to these comments, the Commission noted that it had considered the possibility of providing interpretation of the hearing proceedings in the local native languages, but upon further investigation, decided that this was not necessary in the circumstances. The Commission is committed to ensuring its proceedings are open and transparent and will continue to assess the need for special interpretation services at future proceedings. With respect to the matter of intervenor funding, the Commission noted that it continues to look at this issue but is currently constrained by federal policy.

B. Layman, while also expressing appreciation for the Commission's efforts to hold its proceedings in northern Saskatchewan, noted that, due to the remoteness of the communities and economic constraints, most northerners are still unable to participate effectively and have meaningful input into the decision making process. In response to this comment, the Commission noted that it encourages interested parties to participate in its formal proceedings by oral and/or written submission. The Commission has also made provision for teleconferencing and videoconferencing at its hearings. The Commission notes that use of this technology has facilitated the effective participation of intervenors from remote locations and could, to some extent, assist those intervenors who would prefer to exercise an oral tradition of communication. Furthermore, the Commission notes that staff from its Saskatoon office are frequently at the

mine sites and that the public should feel free to contact the CNSC staff if they have any comments, questions or concerns. The Commission also noted that the public hearings are only one opportunity for involvement and that the licensee also plays an important role in terms of engaging and informing the public.

Based on these considerations, the Commission is satisfied that intervenors were provided adequate opportunity to participate in the hearing process, and that the hearing was conducted in a manner that allowed the Commission to determine the matter in a fair, informal and expeditious manner.

4. Issues and Commission Findings

The Commission addressed the four issues identified in section 1 above under three main headings: (1) the completeness of the Screening Report; (2) the likelihood and significance of the environmental effects; and (3) the nature and level of public concern. The Commission's findings in each of these areas are summarized below.

4.1 Completeness of the Screening Report

In its consideration of the completeness of the Screening Report, the Commission considered whether the assessment had addressed the full scope of the project and assessment factors previously approved by the Commission.

In this regard, CNSC staff stated that, in its opinion, the Screening Report and supporting EASR contain information on the full scope of the project and for all of the factors required for a screening EA under section 16 of the CEAA and as set out in the EA Guidelines approved by the Commission. CNSC staff further noted that the EA was completed to the satisfaction of the CNSC staff and the other expert federal authorities formally identified for the EA in accordance with the CEAA *Federal Coordination Regulations*, including Natural Resources Canada, Fisheries and Oceans Canada, Health Canada and Environment Canada. CNSC staff also noted that Human Resources and Skills Development Canada, the other responsible authority for the EA, considered the assessment to be complete and, in May 2004, rendered its finding that the project is not likely to cause significant adverse environmental effects.

Based on the Commission's review of the Screening Report, and the above statements of CNSC staff, the Commission concludes that the Screening Report is complete. The Commission concludes therefore that it is able to proceed to its consideration of the likelihood and significance of the environmental effects of the project, the adequacy of the proposed mitigation measures, and the public concerns about the project.

4.2 Likelihood and Significance of Adverse Environmental Effects

This section contains the Commission findings with respect to the conclusions in the Screening Report; that is, whether the project, taking into account the identified mitigation measures, is likely to cause significant adverse environmental effects. In examining this question, the Commission first considered the adequacy of the study methods used to identify and evaluate the potential environmental effects, followed by a consideration of the predicted effects on the relevant components of the environment.

4.2.1 Adequacy of the Assessment Method

With respect to the assessment methods, CNSC staff reported that it found the environmental assessment was properly conducted in accordance with the methods for technical study and stakeholder consultation specified by the Commission in the approved EA Guidelines.

The following paragraphs describe the Commission's examination of those aspects of the assessment method on which the Commission, or the intervenors at the hearing, raised specific concerns or questions.

Method for Public Consultation:

M. Shiell, in her intervention, expressed the view that there had been no meaningful public involvement in the EA. Contrary to this view, Cameco and CNSC staff outlined in their submissions and presentations an extensive multi-level and phased public consultation program that was conducted throughout the EA process in accordance with the approved EA Guidelines. The program formed an extension to an ongoing and well established public information program for the operating uranium mines in the Athabaska Basin. The Commission also noted the interventions made by the Environmental Quality Committee (EQC) Northern Mines Secretariat and each of the three regional community-based subcommittees of the EQC in this regard. The EQCs generally praised the efforts of Cameco and the other mine operator in the area, COGEMA Resources Inc. (COGEMA), for their multi-faceted and effective communication programs and efforts to foster knowledgeable public participation in the EAs and other aspects of the uranium mine industry in northern Saskatchewan. Similar supportive comments about the consultation programs were made by several other intervenors. Of particular note in those interventions was the reported willingness of Cameco and COGEMA to provide on-site tours and to facilitate the engagement of northern residents in their own independent environmental monitoring initiatives, such as that carried out by the Athabaska Working Group.

Based on this information, the Commission is satisfied that the methods used to consult with the public during the EA were acceptable and provided a suitable basis for the Commission to evaluate the public concerns about the project. The Commission's findings on the public concerns are discussed further in section 4.3 below.

Method for Assessing Radiological Effects on Non-human Biota:

In their interventions, M. Shiell and B. Adamson expressed the view that Cameco and CNSC staff failed to make proper use of current scientific knowledge about the genetic and somatic effects of alpha radiation on biota, and have failed to employ modern microbiology tools for assessing those effects. In particular, M. Shiell and B. Adamson are of the view that Cameco and CNSC staff failed in their assessment method to adequately take account of the inherent uncertainties that these intervenors consider remain in the assessment of alpha radiation effects on biota and have relied too extensively on model predictions rather than field studies. As an example, these intervenors pointed to the use of what they consider to be an inadequate Radiation Biological Equivalent (RBE) factor used in the calculation of the risks to biota. M. Shiell is also of the view that the time frames used in the EA for assessing when adverse effects of alpha radiation could manifest were too short and should instead look several generations into the future. Furthermore, B. Adamson considers that some important pathways for exposure were not adequately considered in the EA; for example, the impact on vegetation downwind of the facility that would be exposed to radioactive gases and dust released to the atmosphere from the mine ventilation systems.

With respect to these concerns, the Commission questioned CNSC staff on the adequacy of the study methods for assessing radiological effects on the environment. In response, CNSC staff stated that the potential for environmental radiological effects was assessed using recognized, systematic and conservative methods. CNSC staff explained that, using worst-case emission and effluent performance assumptions, the resulting concentrations of radionuclides in air, sediment, water, vegetation and a number of organisms were estimated. The potential risks to the various biota were estimated using an appropriate range of RBE values of between 10 and 40, together with recognized no-effect-level benchmarks. CNSC staff stated that it is therefore satisfied that the issues related to alpha radiation were fully addressed in the Screening Report.

Cameco concurred with this response of CNSC staff and added that, for additional conservatism, toxicity to biota was estimated using the simplest and most bio-available form of the elements in question. Cameco further noted that no credit was assumed in the method for process optimization that normally occurs during the early stages of a facility operation. Cameco also noted that the selection of the Valued Ecosystem Components (VECs) for the study was reviewed in consultation with the community-based Environmental Quality Committees to ensure that species of particular importance to the local communities were included.

With reference to the above-noted intervenors' concerns about the use of mathematical modelling as opposed to actual field studies to assess potential radiological effects, the Commission questioned to what extent the assessment models had been validated with actual monitoring data from other operating uranium mines in the Athabaska basin. In response, Cameco noted that, because the models used in mine design and environmental risk assessments employ worst-case, upper-bound, conservative assumptions, one would not expect, or hope, to measure the predicted effects in the field as a means of validating model accuracy. Actual operating levels are expected to be well below the model predictions. Cameco stated that one of the intents of the planned follow-up monitoring program is to validate this expectation. Cameco also noted that the previous assessments for the project were updated, as appropriate, using

revised baseline information and relevant information derived from the test mining operations at the Cigar Lake Project in 2000.

Based on this information, the Commission concludes that the effects of radiation from the proposed Cigar Lake Project on non-human biota were assessed using appropriate methods. Refer to section 4.2.2 below for a discussion of the Commission's findings with respect to the significance of those predicted environmental effects.

Method for Assessing Radiological Effects on Workers:

B. Adamson, in his intervention, also expressed concern about the methods used to assess the effects of alpha radiation (radon in particular) on the mine workers. B. Adamson is of the view that the current methods of monitoring and estimating doses are inadequate and do not provide the immediate feedback necessary to ensure workers are protected from conditions that can vary rapidly in the mine environment. With reference to a cohort study on former uranium miners that is about to be released by the CNSC, B. Adamson referred to what he considers to be evidence of increased frequency of lung cancer among former uranium miners at Elliot Lake, Ontario and Beaver Lodge, NWT. Based on this information, B. Adamson is of the view that the CNSC is not able to accurately predict long-term effects of radon on human health.

In response to the Commission's questions on these concerns of Mr. Adamson, CNSC staff acknowledged that the internationally recognized cohort study referred to by the intervenor has contributed significantly to the understanding of both low- and high-dose effects to miners and the related issues of the latency of cancer. CNSC staff noted, however, that the miners that were the subject of the cohort study were receiving radiation doses in the order of 100 to 1,000 times higher than that which uranium miners are exposed to currently in Canada. CNSC staff stated that the existing methods for measuring and assessing risks to workers remain reliable. Therefore, CNSC staff concluded that the results of the cohort study did not warrant changes to the method used by CNSC staff in this aspect of the EA.

Based on the above information and considerations, the Commission concludes that the method used for assessing the likely adverse effects of the project on the health of the mine workers was appropriate for this EA. See section 4.2.2 below for a discussion of the Commission's findings on the significance of the predicted effects of the project on human health.

Methods for Assessing the Effects of Accidents and Malfunctions:

CNSC staff reported that ten malfunction or accident events that it considers to be credible were identified and considered in the EA; the most serious being a massive underground flooding of the mine.

With reference to the mine flooding event that occurred at Cameco's McArthur River mine in the spring of 2003, B. Adamson expressed the view that the flooding scenario chosen for the Cigar Lake Project EA may grossly underestimate the real potential magnitude of such an event. B. Adamson stated that the EA refers to an event involving a maximum inflow of water to the mine of 550 m³/hour, whereas the actual inflow to the McArthur River mine exceeded 1,000 m³/hour.

B. Adamson, in his intervention, expressed concern that the effects of a much larger flooding event on miners, effluent treatment capacity, and the downstream environment must be considered.

In response to the Commission's questions on the chosen mine flooding event, Cameco clarified that, for the purpose of the EA and mine design contingency planning, inflow events ranging from 500 m³/hour to an upper bound of 750 to 1,000 m³/hour were assumed. The mine design also includes mine water pumping capacity of 1,500 m³/hour, a contingency surface storage pond capacity of 90,000 m³, and a water treatment plant capacity of 550 m³/hour. Cameco further noted that the mine will be equipped with water-tight bulkheads that would be closed in the event that it appears the capacity of the mine water management system could be exceeded. Cameco stated that the bulkheads will ensure no untreated mine water is released to the environment during a mine flooding event and that the maximum continuous release of treated effluent to the environment would not exceed the 550 m³/hour capacity of the treatment plant. Cameco noted that, while there are significant differences between the McArthur River Mine and the Cigar Lake Mine, Cameco has taken into consideration all relevant information obtained during the flooding event at the McArthur River Mine in selecting an appropriate water inflow event for the purpose of this EA.

The Commission accepts this clarification by Cameco and is satisfied that an appropriate mine flooding event has been identified for the purpose of completing the environmental assessment of project malfunctions and accidents. See section 4.2.2 below for a discussion of the Commission's findings on likelihood and significance of the environmental effects from all identified malfunctions and accidents at the Cigar Lake Project.

Method for Assessing Cumulative Effects:

B. Adamson, in his intervention, expressed the view that the cumulative effects assessment was not supported with a sufficiently detailed and precise assessment and was not consistent with the requirement for control of priority substances under the *Canadian Environmental Protection Act*.

The Commission considered this matter and concluded that the cumulative effects assessment was adequate for the purpose of this screening EA under the CEAA. See section 4.2.5 below for a discussion of the Commission findings on the cumulative effects assessment.

Conclusions on Adequacy of the Assessment Method:

Based on its review of the Screening Report and the above information and considerations, the Commission concludes that the EA methods were acceptable and appropriate.

With respect to the above-noted concerns of some intervenors about the scientific uncertainties associated with the assessment methods, the Commission accepts that such uncertainties are inherent in all such predictive assessment methods. The Commission acknowledges that the science will continue to evolve and improve with appropriate ongoing follow-up, and that responsible authorities, such as the CNSC, must continue to make reasonably conservative, risk-informed decisions based on the best available information and assessment methods. The

following section of this *Record of Proceedings* documents the Commission's considerations and conclusions on the predicted environmental effects of the project.

4.2.2 Effects of the Project on the Environment

CNSC staff stated its conclusion that the construction and operation of the Cigar Lake Project, including a range of potential malfunctions and accidents associated with the project, is not likely to cause significant adverse effects on the environment, taking the identified mitigation measures into account.

In support of its findings, CNSC staff noted that, from a total of 67 potential interactions between the project and the environment (55 biophysical and 12 socio-economic), 19 measurable biophysical changes that the project would likely cause were carried forward for more detailed evaluation. After taking the available mitigation measures for these effects into account, CNSC staff reported that all but the following three effects were considered fully mitigable:

- exposure of scaup (duck) to Polonium-210;
- exposure of terrestrial wildlife to Molybdenum; and
- exposure of benthic invertebrates to Polonium-210.

CNSC staff stated that these effects were further assessed found to be not significant. The only additional mitigation measure deemed necessary by CNSC staff from the assessment results (i.e., in addition to those measures that were already integrated as part of the proposed project design), was the addition of molybdenum reduction in the effluent treatment plant process. Cameco concurred with this finding and has added an iron salt precipitation process to the effluent treatment process to reduce molybdenum concentrations to less than one part per million.

CNSC staff also noted that minor effects from the release of contaminants from the site to adjacent surface water bodies are expected to continue for several decades following the decommissioning of the mine, but that CNSC staff also does not consider those longer-term effects to be significant.

Three intervenors (M. Shiell, B. Adamson and M. Penna) disagreed with the conclusion of CNSC staff and expressed their view that the project is likely to cause significant and lasting adverse environmental effects. M. Shiell is of the view that there is sufficient scientific uncertainty about the nature of the long-term effects on the environment from radiation that an application of the precautionary principle should, in her opinion, lead to a denial of the project. B. Adamson described the projected concentrations of arsenic, chloride, sulphate and uranium in the treated effluent (5, 150, 730 and 28 mg/l respectively) as "severe pollution" that should not be permitted. B. Adamson also expressed concerns about the potential effects on the aquatic environment from nickel, zinc, copper and selenium in the effluent, and the effect on vegetation from exposure to radioactive gases and dust that would be released to the atmosphere from the mine ventilation system. B. Adamson also disagreed with the CNSC staff's conclusion that several decades of post-decommissioning effects would be acceptable. Furthermore, B. Adamson does not consider that the effects of a massive flooding of the mine during operations has been adequately assessed or mitigated. M. Penna expressed concerns about the toxic

chemicals that would be used on the site and the long-term genetic effects on biota from radiation. In support of her view, M. Penna pointed to what she describes as evidence of past failures to protect the environment from uranium mining in Elliot Lake, Ontario and at the Rabbit Lake, Key Lake and Gunnar sites in Saskatchewan.

With respect to the above-noted concerns of intervenors about radiological effects (and as discussed in section 4.2.1 above), CNSC staff stated that it used recognized, conservative and systematic methods for assessing the radiological effects of the project on the environment and formulated its conclusions and recommendations in accordance with the precautionary principle. From that assessment, CNSC staff concluded that the radiological effects of the project are not likely to be significant.

Noting that the potential adverse effects identified in the EA relate to some level of reproductive impairment for the identified species, the Commission questioned how it could be concluded that there would be no corresponding impact on the populations at a species level. In response, CNSC staff, Cameco and the EQC – West Side Subcommittee, stated that the area and number of individuals affected following the implementation of mitigation measures would be very small and temporary (i.e., to the operating period); as such, these participants do not consider the effects on the populations to be significant. The Commission accepts these conclusions.

In response to the Commission's questions about the characteristics and need for treatment of air emissions from the mine as identified by B. Adamson in his intervention, Cameco responded that the radon and radioactive dust in those emissions, because they will originate from the working areas of the mine, will be at very low concentrations and will disperse rapidly upon exiting the ventilation systems. Furthermore, Cameco noted that air samplers will be maintained in the surrounding area to verify that no significant releases are occurring.

With respect to B. Adamson concerns about the effects of a mine flood, Cameco stated that all relevant experience from the McArthur River mine incident had been taken into account in the design of the Cigar Lake Project. The EQC – Athabaska Subcommittee also reported that it met with Cameco to review the mine flooding safety features at the Cigar Lake Project and indicated its satisfaction with how Cameco has responded to the related challenges arising from the earlier incident at the McArthur River mine. CNSC staff expressed its agreement with how this aspect of the EA was conducted in light of the relevant experience from McArthur River mine. CNSC staff concluded that the effects of such an event on worker health or the environment are not likely to be significant given the mitigation measures that will be in place.

Further in regard to the above-noted concerns of B. Adamson about various metals in the effluent that could be released from the site, the Commission questioned how the integrity of the reactive rock piles that will be the source of much of those metals, and control of the resulting leachate, will be managed over the 40 years that the rock is planned to be on the Cigar Lake site. In response, Cameco and CNSC staff explained that, as addressed in an earlier screening EA of the waste rock disposal project⁵, the reactive rock piles will be maintained temporarily at the Cigar

⁵ Canadian Nuclear Safety Commission, August 29, 2003, *Record of Proceedings, Including Reasons for Decision, In the Matter of COGEMA Resources Inc. and Cameco Corporation, Environmental Assessment Screening Report (EA Screening Report) for the Cigar lake waste rock disposal in the McClean Lake mining facility Sue C Pit.*

Lake site prior to being hauled on a campaign basis for disposal at the McClean Lake Sue C Pit. The first haul campaign is scheduled to take place after the first 15 years of mine operation, with no rock remaining at Cigar Lake after 40 years. All drainage from the temporary piles will be treated as appropriate prior to release to the environment. Cameco and CNSC staff stated that the performance of the temporary rock piles will be monitored continuously to verify compliance with applicable discharge limits and, in the event that problems arise, the schedule for hauling and permanent disposal of the rock at the Sue C Pit would be advanced to ensure significant environmental impacts do not develop at the Cigar Lake Project site.

With respect to the above-noted comparisons made by M. Penna to the environmental performance of other mines in northern Saskatchewan and elsewhere, the Commission noted the intervention from B. Layman concerning the work of the Athabaska Working Group. B. Layman reported that, after four years of detailed, community-based environmental monitoring in the vicinity of the Cigar Lake Project and other uranium mine projects in Northern Saskatchewan, nothing of concern has been identified. Several other intervenors commented on what they consider to be a proven record and environmentally responsible operations of the uranium mining industry in northern Saskatchewan. CNSC staff did not provide contrary information that would suggest there is a systemic environmental performance problem at modern uranium mine operations in the Athabaska basin.

With respect to the concerns raised about the long-term, post-decommissioning effects of the project, the Commission questioned whether provisions would be made to minimize those effects through progressive rehabilitation of the mine during operations. In response, Cameco confirmed that the project has been designed for decommissioning and that steps will be taken to minimize the overall footprint on the surface and to progressively remediate the mine. For example, underground mined-out areas will be progressively backfilled and cemented to minimize the amount of rock brought to the surface, reduce ventilation requirements, and reduce mine water management demands. Similarly, as noted above, reactive waste rock will be hauled periodically off-site for below-grade disposal that is appropriate for long-term passive management of that waste. Cameco further noted that, because the Cigar Lake Project does not involve ore milling and associated tailings management, decommissioning will be relatively less complicated than at sites where such components are present.

Further with respect to the long-term, post-decommissioning effects of the project, the Commission sought information on the potential for deep groundwater to become contaminated as it infiltrates the former mine workings, and eventually migrates to, and contaminates, Waterbury Lake or Cigar Lake, both a short distance away. In response, Cameco stated that the detailed geological investigations carried out for mine development show very low groundwater flow in the rock at depth and little upward contaminant flux from the ore body. From its interpretation of the modelling data, Cameco concluded that contamination of the lake via the deep groundwater flow pathways would be undetectable. CNSC staff also noted that the mined-out voids will be backfilled and cemented as the mining progresses, thus limiting the pathways of groundwater flow through the potential contaminant source term. While the Commission accepts this finding for the purpose of the EA, the Commission notes that no plans appear to be in place to gather the necessary baseline data and conduct the necessary follow-up monitoring of deep groundwater quality and flow to verify that prediction. The Commission considers that this

should form part of the EA follow-up program to be developed. The Commission also notes that it will examine the issues related to deep groundwater contamination and movement in greater detail at the licensing stages of the project.

Noting that effective management systems are important for ensuring that the environmental effects of projects remain acceptable, and that mitigation and monitoring programs remain effective and adaptive over time, the Commission considered statements made by Cameco on the nature of the quality management systems that are, or will be, in place for the Cigar Lake Project. In this regard, Cameco stated that it operates on the basis of solid quality principles that ensure implementation of committed programs and their continual improvement. Cameco also noted that its quality management system identifies an experienced management team with clearly defined lines of authority. It also includes a fully integrated change management process and provides for systematic review and integration of lessons learned from incidents. CNSC staff also acknowledged the importance of quality management systems in assuring environmental performance and noted that, if the project proceeds beyond the EA stage, quality assurance, among other things, would be thoroughly examined at the licensing stage.

With respect to the effects of the project on the socio-economic aspects of the environment, the Commission heard from several intervenors, including those representing northern Saskatchewan communities. In all cases, the expectations of intervenors are that the project, by creating jobs and business opportunities, and by training workers in all relevant aspects of health and safety, will have significant positive socio-economic effects in northern Saskatchewan. While the Commission is required to only consider *adverse* environmental effects in making its decision under the CEAA, the Commission wishes to acknowledge efforts of these many intervenors to express their views on these aspects to the Commission.

Conclusion on the Effects of the Project:

Based on its review of the Screening Report, and the above-noted information and considerations, the Commission agrees with CNSC staff's conclusion that the proposed Cigar Lake Project, taking into account the identified mitigation measures, is not likely to cause significant adverse environmental effects. The Commission is satisfied that the projected emissions and effluents from the project, including from the bounding accident of a massive mine flooding event, will be within applicable federal and provincial regulatory limits and guidelines and maintained as low as reasonably achievable. Cameco's ability to comply with the regulatory requirements in this respect will be the subject of the required EA follow-up program and will be re-examined in the context of licensing.

The following sections of this *Record of Proceedings* describe the Commission's findings with respect to the remaining assessment factors specified in the approved EA Guidelines, including how the environment may impact on the project, how renewable resources could be affected, and whether the cumulative adverse effects of the project with other past, current or planned activities in the area would be significant.

4.2.3 Effects of the Environment on the Project

In addition to a consideration of how the project could adversely impact on the environment (as described in the foregoing section of this *Record of Proceedings*), the Commission required that the scope of the assessment include an examination of how the environment itself could adversely impact on the project.

In this regard, CNSC staff reported that the EA examined how severe weather, flooding and seismic events could adversely affect the project. CNSC staff concluded that the planned design features of the project will sufficiently mitigate any such effects.

With respect to the risk of an unplanned rapid influx of groundwater to the mine, the Commission examined such an event in the context of accidents and malfunctions that may occur (see section 4.2.2 above) and, therefore, the issues and Commission findings related to such an emergency are not discussed again here. However, the Commission did seek further information in this part of the assessment with respect to how the mine, and in particular the No. 2 shaft, would be designed to control the influx of water to the mine under normal operating conditions. The Commission notes that Cameco intends to design the No. 2 Shaft so that it will also supply water to the mining operations in a controlled manner.

In response to these questions, Cameco explained how the No. 2 Shaft would be constructed using progressively obtained geotechnical investigation data, concrete liners, grouting and water collection and transfer piping. By applying the grout as necessary, Cameco stated that it will be able to control the influx of water to approximately 25 to 30 m³/hour for use in the mine operation. The Commission accepts this information, but questioned whether the use of the No. 2 Shaft for that purpose, as well as for the emergency egress of miners from underground is appropriate. In response, CNSC staff stated that, while it finds the dual function of the No. 2 Shaft acceptable in principle, this would be the subject of further examination when reviewing the licence applications. The Commission is satisfied with this information for the purpose of this EA.

The Commission requested further information on how the project would be protected from forest fires. In response, Cameco described how the site is surrounded by a fire break (an area cleared of trees to prevent the encroachment of a fire) and that it has fire fighting equipment on site that is capable of fighting modest fires. Failing this, Cameco noted that there is an evacuation procedure that will ensure site personnel are not at risk from a forest fire. Further with respect to the fire break clearing, CNSC staff confirmed that this is a requirement under provincial regulations and that measures are taken to leave the surface vegetation intact so that erosion and sedimentation is not of concern.

In response to follow-up questions on the risk of forest fire, Cameco confirmed that all explosives stored on the site would be kept in fire resistant structures and magazines in compliance with the applicable control regulations. In addition, Cameco stated that all burning and incineration of waste during mine operations will be done in accordance with strict permitting requirements of the Province of Saskatchewan that minimize the risk of initiating a forest fire.

Conclusions on the Effect of the Environment on the Project:

Based on the above information and considerations, the Commission concludes that the environment is not likely to cause adverse effects on the project.

4.2.4 Effects on the Sustainability of Renewable Resources

With respect to the adverse effects of the Cigar Lake Project on the sustainability of renewable resources, CNSC staff reported that it concluded in the EA that no such effects are likely.

In its examination of this factor, the Commission questioned whether fishing by the mine worker population could place undue pressure on the fish resources of Waterbury Lake. In response, Cameco stated that a policy of catch-and-release is, and would continue to be, strongly encouraged and that fishing immediately downstream of the effluent discharge (Aline Lake), while unlikely to occur due to the type of shallow water body, is not permitted.

In response to a question about the effects of the mine on trap lines in the area, Cameco stated that trap lines in the vicinity continue to be used on an approximate bi-annual basis and they are covered under a Trapper Compensation Agreement.

Based on this information, the Commission concludes that the project is not likely to have a significant adverse effect on the sustainability of renewable resources.

4.2.5 Cumulative Effects of the Project

With respect to the requirement to also examine cumulative effects, CNSC staff stated its finding that there are no residual adverse effects of the project that overlap in time and space with other past, present or planned projects. CNSC staff concluded therefore that the project is not likely to cause significant adverse cumulative effects on the environment.

The Commission accepts this conclusion of CNSC staff.

4.2.6 Conclusions on the Likelihood and Significance of Adverse Environmental Effects

Based on the considerations and reasons noted above, the Commission agrees with the CNSC staff's conclusion that the proposed Cigar Lake Project is not likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.

The Commission is also satisfied that the likelihood and significance of the effects has been identified with reasonable certainty.

Furthermore, the Commission is satisfied that the proposed scope of the follow-up program will be adequate for verifying and, if necessary, identifying where additional mitigation measures may be required during the project implementation. Further with respect to the development and implementation of the follow-up program, the Commission heard from several intervenors about the benefits that have been realized (both economic and in terms of personal development and

public confidence) through the involvement of the local people and communities in monitoring the environmental performance of the mine sites in northern Saskatchewan. The Commission encourages the continuation of this practice in the development and implementation of the EA follow-up program for the Cigar Lake Project.

4.3 Public Concern

With respect to public concern as a factor in its consideration of whether to refer the project to the federal Minister of the Environment for a review panel or mediator, the Commission first examined whether the public had sufficient opportunity to become informed about the project and the environmental assessment, and express their views on it. The Commission required, as set out in the approved EA Guidelines, that there be a comprehensive and ongoing public consultation program that engaged a variety of stakeholders through a variety of opportunities and events.

As described in section 4.2.1 above, the Commission is satisfied that Cameco and CNSC staff consulted appropriately with the public, First Nations and other interested stakeholders in accordance with the direction set out in the approved EA Guidelines. The Commission is therefore satisfied that the public had adequate opportunity to become informed about the project and express any concerns.

CNSC staff summarized the general nature of public concerns as falling into the following two categories:

- long-term effects of alpha radiation; and
- regulatory delays in projects.

With respect to the public concerns about alpha radiation, CNSC staff stated that it is satisfied that the issues related to alpha radiation were fully addressed in the Screening Report. CNSC staff further expressed the view that the study was conservative with respect to the potential effects of alpha radiation and that those effects are predicted to be transient, reversible and restricted to a relatively small area of relatively low ecological significance. As discussed in detail in sections 4.2.1 and 4.2.2 above, the Commission accepts this conclusion of CNSC staff and is satisfied that the public concerns about alpha radiation were adequately addressed in this screening EA.

On the matter of public concern about regulatory delays, the Commission acknowledges that, from many of the interventions presented, the uranium mining industry in northern Saskatchewan has had, and continues to have, a significant positive impact on the economy and well-being of the residents in the area. The Commission heard from these intervenors that the people are now more accepting and trusting of the industry and are anxious to obtain the skills and wages that jobs will provide for their personal and community development. However, and while the Commission understands why some may be impatient with the process, the Commission wishes to point out that regulatory scrutiny of the projects is an essential part of ensuring that projects do not also result in unreasonable risks to health, safety, environment and

security and that the regulated industry continues to improve. The Commission strives to complete its reviews efficiently and thoroughly using the best available science, as well as taking full account of the views of stakeholders.

In conclusion, therefore, the Commission is satisfied that the public concerns raised during the completion of the EA and at this public hearing were adequately addressed. The Commission considers that the remaining relevant concerns are of a nature that can be addressed in the follow-up program and future consideration of the licence applications.

The Commission therefore decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator on the basis of public concern (i.e., pursuant to subparagraph 20(1)(c)(iii) of the CEAA).

5. Conclusion

The Commission has considered the information and submissions of the proponent, CNSC staff and the intervenors as presented for reference on the record for the hearing.

The Commission concludes that the environmental assessment Screening Report attached to CMD 04-H13 is complete and meets all of the applicable requirements of the *Canadian Environmental Assessment Act*.

The Commission concludes that the project, taking into account the appropriate mitigation measures identified in the Screening Report, is not likely to cause significant adverse environmental effects.

Furthermore, the Commission decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator on the basis of public concern.

Therefore, the Commission, pursuant to paragraph 20(1)(a) of the CEAA, decides to proceed with the consideration of a licence application under the *Nuclear Safety and Control Act* which, if approved, would allow the project to proceed.

Marc A. Leblanc
Secretary,
Canadian Nuclear Safety Commission

Date of decision: June 10, 2004

Date of release of Reasons for Decision: June 30, 2004

Appendix A – Intervenors

Intervenors	Document Number
Northern Saskatchewan Environmental Quality Committee, South Central Subcommittee, represented by Jonas Bird	CMD 04-H13.2 CMD 04-H13.2A
Northern Saskatchewan Environmental Quality Committee, Athabasca Subcommittee, represented by John Lepine	CMD 04-H13.3 CMD 04-H13.3A
Northern Saskatchewan Environmental Quality Committee, West Side Subcommittee, represented by Robert Woods	CMD 04-H13.4 CMD 04-H13.4A
Northern Saskatchewan Environmental Quality Committee, Northern Mines Monitoring Secretariat, represented by Betty Hutchinson	CMD 04-H13.5 CMD 04-H13.5A
Northern Resource Trucking, represented by Dave McIlmoyl	CMD 04-H13.6 CMD 04-H13.6A
Northlands College, represented by Peter Mayotte	CMD 04-H13.7 CMD 04-H13.7A
Thyssen Mining Construction of Canada Ltd., represented by Rene Scheepers	CMD 04-H13.8 CMD 04-H13.8A
Points Athabasca Contracting Ltd., represented by Glen Strong	CMD 04-H13.9 CMD 04-H13.9A
Kitsaki Management Limited Partnership, represented by Ray McKay	CMD 04-H13.10 CMD 04-H13.10A
Population Health Unit, represented by James Irvine	CMD 04-H13.12 CMD 04-H13.12A
Maisie Shiell	CMD 04-H13.13 CMD 04-H13.13A
AREVA/COGEMA Resources Inc., Idemitsu Uranium Exploration Canada Ltd. and TEPCO Resources Inc., represented by Vincent Martin, Toshiro Shibahara and Masa Tomita	CMD 04-H13.14
Bill Adamson	CMD 04-H13.15 CMD 04-H13.15A
Marion Penna	CMD 04-H13.16
Bill Layman	CMD 04-H13.17
Georgina L. MacDonald	CMD 04-H13.18
Rene Rediron	CMD 04-H13.19