Record of Proceedings, Including Reasons for Decision

In the Matter of

Proponent	Atomic Energy of Canada Limited
Subject	Screening Environmental Assessment for the Proposed Decommissioning of the Fuel Storage and Handling Bays at the Chalk River Laboratories
Date of Hearing	October 25, 2006

RECORD OF PROCEEDINGS

Proponent:	Atomic Energy of Canada Limited
Address/Location:	Chalk River Laboratories, Chalk River, Ontario, K0J 1J0
Purpose:	Screening Environmental Assessment for the proposed decommissioning of the fuel storage and handling bays at the Chalk River Laboratories
Application received:	n/a
Date(s) of hearing:	October 25, 2006
Location:	Canadian Nuclear Safety Commission (CNSC), 280 Slater St., 14th. Floor, Ottawa, Ontario
Members present:	L.J. Keen, Chair C.R. Barnes M.J. McDill
Secretary:	M.A. Leblanc
Recording Secretary:	M. Young
Legal Counsel:	S. Maislin Dickson

Proponent Represented By		**Document Number**
• B. Lange, Director, Waste Management and Decommissioning Operations • M. Klukas, Section Head Environmental Assessment • S. Kenny, Manager, CRL Decommissioning Facilities • D. Killey, Senior Scientist		
CNSC staff		
• C. Taylor • C. David	• R. Maxwell	CMD 06-H132

Date of Decision: October 25, 2006

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Introduction

1. Atomic Energy of Canada Limited (AECL) has applied to the Canadian Nuclear Safety Commission (CNSC[1]) to seek approval for the proposed decommissioning of the fuel storage and handling bays at the Chalk River Laboratories (CRL), located in Chalk River, Ontario.

2. AECL proposes to decommission the fuel storage and handling bays, demolish Buildings 204 A and B, which house the bays, and remediate the site. The project will be carried out in three phases. The purpose of this project is to remediate and designate the site for re-use in a manner that is consistent with its location in the developed area of the CRL site. The authorization of this activity requires an amendment to AECL's Nuclear Research and Test Establishment Operating Licence pursuant to subsection 24(2) of the *Nuclear Safety and Control Act*[2] (NSCA).

3. Before the Commission can decide on the proposed licence amendment, the Commission must, in accordance with the requirements of the *Canadian Environmental Assessment Act*[3] (CEAA), make a decision on an environmental assessment (EA) of the proposal. Pursuant to section 15 of the CEAA, the type of EA required for this project is a screening. The Commission is the sole responsible authority[4] (RA) for the EA.

4. The guidelines for the EA (EA Guidelines) were approved by a Designated Officer on December 20, 2000 and used in delegating the conduct of technical studies for the screening of this project to AECL, pursuant to section 17 of the CEAA. The resulting EA Study Report was then used by CNSC staff for the preparation of the draft EA Screening Report (Screening Report). Stakeholders, including the federal authorities, were provided an opportunity to review the draft Screening Report prior to its finalization and submission to the Commission for this hearing and decision.

5. This *Record of Proceedings* describes the Commission's consideration of the Screening Report and provides its reasons for decisions. The Screening Report of AECL's proposal to decommission the fuel storage and handling bays at the CRL site is attached as an appendix to CMD 06-H132.

Issues

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

    a) 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

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[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] S.C. 1997, c. 9.
[3] S.C. 1992, c. 37.
[4] Responsible Authority in relation to an EA is determined in accordance with subsection 11(1) of the CEAA.

were adequately addressed;

b) whether the project, taking into account the mitigation measures identified in the Screening Report, is likely to cause significant adverse environmental effects;

c) whether the project must be referred to the federal Minister of the Environment for referral to a review panel or mediator, pursuant to paragraph 20(1)(c) of the CEAA; and

d) whether the Commission will proceed with its consideration of an application for a licence under the NSCA, consistent with paragraph 20(1)(a) of the CEAA.

Hearing

7. Pursuant to section 22 of the NSCA, the President of the Commission established a Panel of the Commission to hear this matter.

8. The Panel of the Commission (hereafter referred to as the Commission), in making its decision, considered information presented for a hearing held on October 25, 2006 in Ottawa, Ontario. During the hearing, the Commission received a written submission and an oral presentation from CNSC staff (CMD 06-H132). Representatives from AECL were present via teleconference.

Decision

9. Based on its consideration of the matter, as described in more detail in this *Record of Proceedings,* the Commission decides that:

a) the Environmental Assessment Screening Report appended to CMD 06-H132 is complete; that is, the scope of the project and assessment were appropriately determined in accordance with section 15 and 16 of the *Canadian Environmental Assessment Act*, and all of the required assessment factors were addressed during the assessment;

b) the project, taking into account the mitigation measures identified in the Environmental Assessment Screening Report, is not likely to cause significant adverse environmental effects;

c) it will not refer the project to the federal Minister of the Environment for his referral to a federal Environment Assessment review panel or mediator;

d) it will proceed to consider the application for licence amendment under the provisions of the *Nuclear Safety and Control Act*, consistent with paragraph 20(1)(a) of the *Canadian Environmental Assessment Act*.

Issues and Commission Findings

10. The findings of the Commission are based on the Commission's consideration of all the information and submission available for reference on the record for the hearing.

Completeness of the Screening Report

11. In its consideration of the completeness of the Screening Report, the Commission considered whether the assessment had adequately addressed an appropriately defined scope of project and assessment factors.

12. CNSC staff stated that the Screening Report contained 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.

13. CNSC staff further reported that the following expert federal authorities were notified of the project pursuant to the CEAA *Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements*[5]: Health Canada, Environment Canada, and Fisheries and Oceans Canada (DFO). These federal authorities were provided with the opportunity to participate in the preparation of the draft EA Guidelines and the draft EA Screening Report. CNSC staff noted that Health Canada was the only federal authority to submit comments on the EA Guidelines.

14. The Ontario Ministry of the Environment was also provided with the opportunity to participate in the preparation of the draft EA Guidelines and the draft EA Screening Report. The Ontario Ministry of the Environment determined that there are no provincial environmental assessment requirements under the *Ontario Environmental Assessment Act*[6] for this project.

15. Based on the Commission's review of the EA Guidelines and Screening Report, the Commission concludes that the scope of the project and the scope of the factors for the assessment are appropriate and that all of the required factors were addressed during the assessment.

16. The Commission also concludes that the Screening Report is complete and compliant with the requirements of the CEAA.

[5] S.O.R./97-181.
[6] R.S.O. 1990, c. E.18.

Likelihood and Significance of Environmental Effects

17. This section contains the Commission's findings with respect to whether the project is likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.

Adequacy of the Assessment Methods

18. In its submission, CNSC staff outlined the methodology used in the assessment of the direct and indirect effects of the project on the environment. CNSC staff noted that the assessment of likely effects of the project on the environment was carried out in a step-wise manner.

19. CNSC staff stated that the EA involved a progressive identification, screening and assessment of significance of potential interactions between the project (from activities related to the normal operations and the effects of probable malfunctions and accidents) and the various components of the environment.

20. CNSC staff outlined in its submission the extent of the consultations that were conducted during the EA process. CNSC staff initiated a public comment period on the draft Screening Report, and key stakeholders, including federal authorities, were sent the Screening Report for their review.

21. The Commission inquired as to the extent of communications with the Regional Municipality of Ottawa-Carleton, now the City of Ottawa. AECL responded that formal consultations had not been carried out with respect to the EA, but public consultation activities were held in 2002. AECL explained that these involved open houses, presentations to employees and letters to stakeholders, including the City of Ottawa. AECL confirmed that the City of Ottawa had had an opportunity to comment but had not chosen to interact.

22. CNSC staff noted that the draft Screening Report was made available for public review from May 29th, 2006 to June 23rd, 2006 and a notice of solicitation for public comments was posted on the CNSC Web site. CNSC staff stated that there were no requests for the Screening Report itself, nor were any comments from the public or stakeholders received.

23. The Commission is satisfied that the methods used to consult with the public during the EA, including opportunities to comment and review the Screening Report, were acceptable and provided a suitable basis for the Commission to evaluate the public concerns about the project.

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

Effects of the Project on the Environment

25. CNSC staff reported that there were several project activities expected to result in likely significant measurable effects requiring the consideration of mitigation measures. CNSC staff noted that these activities could result in an increased loading of radionuclide and hazardous substance (aluminium, copper, zinc) releases to the Ottawa River. Based on the screening of the issues, CNSC staff concluded, however, that the proposed project is not likely to cause significant adverse effects on the environment, taking into account the identified mitigation measures, including treatment of water from the bays at the CRL Waste Treatment Centre (WTC).

26. CNSC staff also stated that cleaning, demolition, remediation and related waste management activities would result in a small increase in radionuclide concentration in the atmosphere. These releases could result in workers being exposed to radiation, as well as deposition on terrestrial vegetation and wildlife habitat and subsequent potential uptake of radiological contaminants by terrestrial non-human biota. Mitigation techniques proposed in order to reduce or eliminate these effects include the use of air filters to control radioactive emissions, erecting enclosures to contain emissions and monitoring airborne emissions.

27. CNSC staff noted that contaminated waste (sludge, filters, system components, demolition, sands and soils), if improperly stored, could leach into the ground and contaminate soil and groundwater. CNSC staff reported that all contaminated waste will be stored in engineered storage facilities at CRL. In the event that a disposal facility is not available or if the final decommissioning schedule is advanced, additional storage facilities would be constructed at CRL, subject to EA and regulatory approval applicable at that time.

28. The Commission inquired about the duration of the mitigation process. AECL responded that the mitigation techniques would be in place until the bays were empty. The Commission also asked if AECL had the capacity to remove the fine metal components from the cleaning process. AECL responded that it did, and that a bag filter was used.

29. The Commission asked if the predicted amount of metal that would be released into the Ottawa River was acceptable. CNSC staff responded that it was.

30. The Commission sought assurance that the liquids eventually released to the Ottawa River would be well within regulatory limits. AECL responded that the largest proportion of contamination was retained and immobilized and the distillate from the liquid waste evaporator was then released to the river in compliance with the waste treatment centre release levels.

31. The Commission also asked if the monitoring would continue through the third phase of the decommissioning process. AECL responded that groundwater and airborne emissions would be monitored to the extent required in Phase III (dismantling and demolition), until the time at which the equipment is removed.

32. Based on its review of the Screening Report and the above-noted information and considerations, the Commission concludes that the proposed project, taking into account the identified mitigation measures, is not likely to cause significant adverse environmental effects.

Effects of the Environment on the Project

33. CNSC staff reported that the EA examined how extreme weather conditions, tornadoes, overflow of the Ottawa River, earthquakes, forest fires and climate change could adversely affect the project. CNSC staff noted that the probability of occurrence of such events was low and the radiological consequences of such events were also low. CNSC staff also noted that the buildings were constructed in the 1940s and have withstood the test of time.

34. CNSC staff explained that the proposed monitoring and maintenance of Buildings 204A/B and of the emptied bays during the forty-year storage with surveillance period will ensure that the building structures and systems remain in good working order and are safe and well-maintained. In addition there are design, monitoring, maintenance and contingency measures, and plans to prevent or reduce potential adverse effects of such events.

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

Effects of Accident and Malfunction Events

36. CNSC staff stated that it had assessed the potential effects of the following accident and malfunction events: collapse of the concrete bay walls during removal of water from bays; leaks/spills during transfer of the bays' water to the Active Drain Line; and failure of the Active Drain Line and secondary containment during the transport of bay water to the WTC. CNSC staff stated that the three accident and malfunction scenarios were not likely to cause significant environmental effects.

37. In its oral presentation, CNSC staff informed the Commission that the removal of the 204A bay water for treatment at the Chalk River Liquid WTC and the physical separation between building 204 and the NRX reactor had already been completed. CNSC staff explained that under normal circumstances, the responsible authority may not authorize any part of a project subject to the CEAA to proceed until the EA is complete and a positive conclusion in respect to that assessment is rendered. However, the initial works were authorized by CNSC staff due to an identified urgent need to reduce a risk of fire at the facility. CNSC staff explained that it was determined that a fire in 204A bays could rapidly spread to the adjoining NRX reactor hall and lead to potential structural failures in that building, and a complete fire break, including within the bay trench, was needed to mitigate that risk. CNSC staff noted that this was done in accordance with paragraph 7(1)(c) of the CEAA, which allows a project to be carried out without an environmental assessment in response to an emergency and is in the interest of preventing damage to property or the environment. CNSC staff stated that it was satisfied that

the mitigation measures for this part of the project were implemented by AECL and that they were effective in mitigating the potential adverse effects.

38. The Commission sought assurance that the bay walls would not collapse. AECL responded that metal braces were put in place when the water was removed from the bays.

39. Based on the above information and considerations, the Commission concludes that accident and malfunction events are not likely to cause adverse effects on the project.

Cumulative Effects

40. With respect to the requirement to also examine cumulative effects, CNSC staff stated that the cumulative effects from the project in combination with other projects were not expected to occur because all radioactive and toxic emissions and process sewer discharges would remain low and well below regulatory limits. CNSC staff stated that, with the implementation of identified mitigation measures, no significant adverse cumulative effects would result from normal operations.

41. Based on the information received, the Commission concludes that, taking into account the identified mitigation measures, significant adverse cumulative effects are not expected to occur as a result of the project.

Follow-Up Program

42. CNSC staff noted that there were a few issues that would involve additional monitoring as part of a formal follow-up program. The CNSC licensing and compliance program would be used as a mechanism for ensuring the final design and implementation of follow-up activities and for reporting results. Issues included in the follow-up program are: characterizing the bays water prior to transfer to the WTC; AECL continuing to monitor and assess the requirements for interception and treatment of the groundwater plume which originates from a leak at the 204A bay; ensuring that the waste storage/disposal areas within the CRL site are available to accommodate the volumes and types of waste produced prior to undertaking Phase III activities; and ensuring that the management (removal to disposal) of asbestos-containing waste complies with all regulatory requirements in force at the time that these activities will be carried out.

43. The Commission sought assurance that the groundwater plume would continue to be monitored. AECL responded that the current ongoing groundwater monitoring associated with the NRX rod bays consisted of quarterly sampling near the CRL waterfront, down gradient of the NRX bays and of other facilities in the built-up portion of the site. AECL stated that this program would continue indefinitely.

44. The Commission considered the future removal of water from the NRX and 204A bays. The Commission asked if any changes were expected as a result of water being removed from them. AECL replied that the tritium levels in the groundwater are predicted to drop to background levels in two years. CNSC staff confirmed that monitoring the groundwater plume would continue.

45. The Commission noted that it expects to be kept up to date on the progress of this project, including updates in the AECL CRL mid-term report. The Commission expects these updates to cover the monitoring of the groundwater plume.

46. The Commission is satisfied that the CNSC licensing and compliance program responsible for ensuring the final design and implementation of the Follow-Up Program would be adequate to verify and, if necessary, identify where additional mitigation measures may be required.

Conclusion on the Likelihood and Significance of Adverse Environmental Effects

47. Based on the considerations and reasons noted above, the Commission agrees with CNSC staff's conclusion in the Screening Report that the proposed decommissioning project is not likely to cause significant adverse environmental effects, taking into account the identified mitigation measures.

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

Nature and Level of Public Concern

49. 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.

50. As noted in paragraph 23, the Commission is satisfied that AECL and CNSC staff consulted appropriately with the public and other interested stakeholders. The Commission is therefore satisfied that the public had adequate opportunity to become informed about the project and express any concerns.

51. CNSC staff reported that no comments were received from stakeholders or the public on the draft Screening Report. No concerns were raised that would justify referring the project to the federal Minister of the Environment for a referral to a review panel or mediator.

52. The Commission therefore decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator under paragraph 20(1)(c) of the CEAA.

Conclusion

53. The Commission concludes that the environmental assessment Screening Report attached to CMD 06-H132 is complete and meets all of the applicable requirements of the *Canadian Environmental Assessment Act*.

54. 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.

55. Furthermore, the Commission also concludes that, at this time, it will not refer this project to the federal Minister of the Environment for a referral to a review panel or mediator in accordance with the provisions of the CEAA.

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

57. The Commission notes that it expects an update on this project from AECL in its next AECL CRL mid-term report.

Linda J. Keen,
President,
Canadian Nuclear Safety Commission

Date of decision: October 25, 2006
Date of release of Reasons for Decision: March 7, 2007