Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant Atomic Energy of Canada Limited

Subject Screening Environmental Assessment for the Proposed Shielded Modular Above-Ground Storage at the Chalk River Laboratories

Date May 25, 2006

RECORD OF PROCEEDINGS

Applicant:	Atomic Energy of Canada Limited
Address/Location:	Chalk River Laboratories, Chalk River, Ontario K0J 1J0
Purpose:	Screening Environmental Assessment for the proposed shielded modular above-ground storage at the Chalk River Laboratories
Application received:	N/A
Date(s) of hearing:	April 27, 2006
Location:	Canadian Nuclear Safety Commission (CNSC), 280 Slater St., 14th. Floor, Ottawa, Ontario
Member present:	C.R. Barnes, presiding Member J.A. Dosman
Secretary:	M.A. Leblanc
Recording Secretary:	P. Bourassa
General Counsel:	J. Lavoie

Applicant Represented By	**Document Number**
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CNSC staff	
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Date of Decision: April 27, 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 construction and operation of shielded modular above-ground storage (SMAGS) in the Waste Management Area (WMA) "H" at the Chalk River Laboratories (CRL), located in Chalk River, Ontario.

2. AECL proposes to construct six SMAGS buildings to store solid low-level radioactive wastes generated through its CRL operations and decommissioning activities, as well as wastes from off-site commercial generators. 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) screening of the proposal. The Commission is the sole responsible authority for the EA.

4. The guidelines for the EA (EA Guidelines), including statements of the scope of the project and scope of the assessment, were approved by the Designated Officer on May 11, 2005. The EA Guidelines were used by CNSC staff in delegating to AECL, pursuant to section 17 of the CEAA, the preparation of technical studies to satisfy the requirements of the EA Guidelines. AECL provided the technical studies which underwent a review by experts at the CNSC and other relevant government departments. 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 its reasons for decisions on the results.The Screening Report of AECL's proposal to construct and operate the shielded modular above-ground storage at the CRL site is attached as an appendix to CMD 06-H113.

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 were adequately addressed;

[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

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 *Nuclear Safety and Control Act*, 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 April 27, 2006 in Ottawa, Ontario. During the hearing, the Commission received written submissions from AECL (CMD 06-H113.1) and CNSC staff (CMD 06-H113).

9. The hearing was conducted in accordance with the Commission's process for considering matters pursuant to the CEAA and Rule 3 of the *Canadian Nuclear Safety Commission Rules of Procedure*[4]. In establishing the process, the Commission determined that it was not necessary to hold a public hearing on the matter.

Decision

10. 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-H113 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;

[4] SOR/2000-211

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

11. The Commission addressed the four issues identified in paragraph 6 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.

12. The findings of the Commission presented below 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

13. 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.

14. CNSC staff reported that, on May 11, 2005, the Designated Officer established EA Guidelines, including statements of project scope and scope of the assessment factors as required by sections 15 and 16 of the CEAA. CNSC staff stated that, in its opinion, the Screening Report contains 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.

15. CNSC staff noted that the Screening Report prepared for the Modular Above-Ground Storage (MAGS) project and approved by CNSC in 1999 was used as the basis for this Screening Report as well as the Study Report prepared by AECL. This is consistent with the approach proposed in section 24 of the CEAA.

16. CNSC staff further reported that the following expert federal authorities were notified of the project pursuant to the CEAA *Federal Coordination Regulations*: Natural Resources Canada, Fisheries and Oceans Canada (DFO), Environment Canada, Health Canada and Indian and Northern Affairs Canada. These federal authorities were provided with the opportunity to participate in the preparation of the draft EA Guidelines and the draft EA Screening Report.

17. 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* for this project.

18. In its consideration of the scope of the project, the Commission sought further information regarding the physical works involved in the proposed project to ensure sufficient space had

been considered to meet future demands. In response, AECL noted that the proposed project would represent the low-level radioactive waste storage needs for the next 20 years. AECL further noted that the proposed six SMAGS units would be built on the existing footprint of the MAGS structures.

19. The Commission questioned whether alternative methods of storage or disposal of the waste had been explored. CNSC staff noted that several alternatives had been evaluated including volume reduction and construction of additional MAGS structures and that, all options considered, the use of SMAGS units remained the best option.

20. AECL stated that the proposed SMAGS project has been developed to improve low-level waste management and account for the immediate need for additional storage at the CRL. Noting that it had already considerably reduced the decommissioning waste by segregation, AECL stated that it would also examine additional methods of waste reduction such as the use of a waste analysis facility for further segregation of the contaminated waste. AECL also noted that it would consider methods to convert the waste into a homogenous form that can easily be monitored and analyzed. The Commission notes its support for the continued consideration of additional or alternative methods for further waste reduction.

21. Considering the potential for build-up of contamination inside the proposed buildings, the Commission sought assurances that the proposed monthly monitoring, as indicated in the project description, was adequate to ensure the health and safety of the workers. AECL explained that this monitoring refers to the monthly sampling, based upon the sample sizes taken from the tritium bubblers that operate continuously. With respect to possible contamination build-up, AECL noted that the ventilation system would be operational to remove any contamination prior to staff entering the buildings. Furthermore, AECL noted there would also be routine checking for surface contamination as required by AECL's Environmental Monitoring Program.

22. With respect to nuclear criticality at the site, the Commission suggested that the consequences of such an event, albeit remote, should be considered not only for the public but for the many workers at the CRL site as well as to ensure the safe ongoing or shutdown operations of other facilities on site. CNSC staff agreed and will include a statement to this effect in the future.

23. Based on this information and 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 were appropriate and that all of the required factors were addressed during the assessment.

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

Likelihood and Significance of Environmental Effects

25. This section contains the Commission's findings with respect to 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, including the public consultation process, followed by a consideration of the predicted effects on the relevant components of the environment.

Adequacy of the Assessment Methods

26. 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.

27. The EA involved a progressive identification, screening and assessment of significance of potential interactions between the project (under both normal, and accident and malfunction conditions) and the various components of the environment, that is the geology and hydrogeology, the atmosphere, human health, and the aquatic and terrestrial environment.

28. CNSC staff noted that the EA also included a comparison of the MAGS operational activities to those of the SMAGS, an examination of the potential effects of the environment on the project, the cumulative effects with other projects in the area and the need for follow-up activities.

29. With respect to the description of the existing environment and specifically the physiography and topography, the Commission noted that AECL's statement that no major movement along the fault system is believed to have occurred over 500 years may not be accurate. In this regard, the Commission suggested that the facts should be verified if this information were to be used in future licensing application.

30. CNSC staff outlined in its submission the extent of the consultations that were conducted during the EA process. Based on limited interest expressed by the public as reported in the AECL Stakeholder Consultation Plan and in observations by CNSC staff during an open house event, CNSC staff concluded that public review and comment on the EA Guidelines was not warranted. 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.

31. The Commission sought further information on the extent of AECL's consultations on the Study Report used as a basis for the Screening Report. AECL noted that considerable consultation had taken place during the EA carried out for the MAGS project. AECL indicated that a written notification of the SMAGS EA was sent to the parties who had shown interest in the MAGS EA and other interest groups. AECL had also sent a letter describing the proposed SMAGS project to the local community.

32. 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. The Commission's findings on the public concerns are discussed further in the section below entitled Nature and Level of Public Concern.

33. 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

34. CNSC staff reported that the main project activities expected to result in likely significant measurable effects requiring the consideration of mitigation measures were the waste handling and compacting in the Waste Handling Building (WHB), the construction of the SMAGS buildings and the waste transfer, emplacement and monitoring of the buildings. CNSC staff noted that these activities could result in airborne emissions and the potential for worker exposure to radiation fields when carrying certain activities. 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 the identified mitigation measures into account.

35. In support of its findings, CNSC staff noted that, from a total of 52 potential interactions between the project and the environment, those with measurable effects that the project would likely cause and that were not previously assessed in the MAGS Screening Report were carried forward for more detailed evaluation. After taking the available mitigation measures for these effects into account, CNSC staff concluded from an assessment of each of those interactions that no likely significant adverse environmental effects are expected to occur.

36. The Commission sought assurances that the potential for contamination of groundwater and release of radioactive material into the Ottawa River had been adequately addressed in the EA. AECL stated that the current operation and monitoring of the MAGS structures have demonstrated that there is no additional releases to the river as a result of this type of operation and that this is expected to continue with the operation of the SMAGS buildings. AECL noted that in addition to its current monitoring of the mainstream, it would be adding additional sampling stations and monitoring wells to monitor immediately below the proposed facility before the mainstream. AECL further noted that a geotextile membrane would be placed below the foundation of the buildings to provide an additional barrier to any releases that might emanate from the facility over its lifetime.

37. With respect to the potential impact on conventional health and safety, the Commission sought further information on the procedures and training provided to the workers. CNSC staff noted that experience gained at a similar operation at Ontario Power Generator's Western Waste Management Facility has demonstrated that adequate procedures and training would ensure that risks remain low. CNSC staff noted that AECL already has in place the procedures and training from the MAGS operation to ensure worker safety at all times.

38. Considering that the proposed buildings would be built very close to each other, the Commission sought further information with respect to the geotechnical studies performed to ensure the adequacy of the site location. AECL stated that geotechnical evaluations were conducted for the Waste Management Area "H" site which confirmed the suitability for buildings of this type.

39. 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

40. CNSC staff reported that the EA examined how flooding, external fire, earthquake and extreme winds and tornadoes could adversely affect the project. CNSC staff noted the implementation of measures in the planned design features and operational measures of the project to adequately address any potential effects of the environment on the project. CNSC staff also noted that any clean up after an event would be done in accordance with AECL's Radiation Protection and Occupational Health and Safety requirements and procedures.

41. The Commission sought assurances that sufficient measures would be taken to mitigate the impact of a seismic event. AECL noted that the design of the buildings incorporate a substantial concrete foundation which is reinforced and designed to accommodate the loads of these stacked containers in a manner that is consistent with the seismic zoning and requirements of the CRL site.

42. 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

43. CNSC staff stated that it had assessed the potential effects of the following accident and malfunction events: burst package, fire and loss of process systems. Taking into account the mitigation measures, CNSC staff stated that the expected consequences of these events were low. CNSC staff noted that additional information would be provided at the licensing stage if the matter so proceeds.

44. The Commission sought assurances that a burst package would not expose workers to unacceptable radiological hazards. CNSC staff responded that levels of radioactivity and radiological exposure to workers have been assessed for this type of event and have been found to meet regulatory requirements. AECL noted that the risk to the workers from failure of the packages is low given the very low specific activity of the waste and the adequate protective equipment worn by the workers.

45. The Commission sought further information with respect to the probability of a fire and the measures in place to mitigate possible consequences. AECL explained that the risks associated with combustion are low, considering that the wastes would be compacted and placed into closed steel containers. CNSC staff stated that if a fire were to occur in a bin itself, it would primarily be localized within that bin and that the risk of spreading was low. CNSC staff noted that AECL has on-site fire capabilities with staff trained in radiation protection to respond quickly to any such incidents.

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

Cumulative Effects

47. With respect to the requirement to also examine cumulative effects, CNSC staff stated that SMAGS project will have negligible residual effects on the environment and will not generate solid wastes outside of the normal CRL practice. CNSC staff further stated that worker radiation dose would be managed so that doses would remain well below regulatory limits and As Low As Reasonably Achievable (ALARA). CNSC staff concluded that, with the implementation of identified mitigation measures, no significant adverse cumulative effects would result from normal operations.

48. Based on the information received, the Commission concludes that significant adverse cumulative effects are not expected to occur as a result of the project.

Follow-Up Program

49. The CNSC staff noted that the objectives of the Follow-Up Program are to assist in determining if the environmental and cumulative effects of the project are as predicted, to confirm that the mitigation measures are implemented and effective, and to determine if any new mitigation measures may be required. CNSC staff stated that the objectives of the Follow-Up Program for this project would be met through the monitoring activities performed under AECL's Environmental Protection and Radiation Protection Programs at the CRL site. CNSC staff also noted that a regular monitoring program would be implemented for the air emissions from the SMAGS buildings.

50. Noting the general information provided by CNSC staff on the Follow-Up Program, the Commission sought assurance that further detail was not necessary at this stage. CNSC staff responded that the details of the Program, including the elements to be monitored would be provided at the licensing stage and normally recommended to be added to the licence as a condition. In response to the Commission's enquiry as to what would be some elements to be monitored, CNSC staff noted that the elements could include soil and terrestrial vegetation sampling and monitoring of emissions from the compactor.

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

Conclusions on the Likelihood and Significance of Adverse Environmental Effects

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

53. 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

54. 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.

55. As noted in paragraph 32 above, 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.

56. CNSC staff reported that comments were received from Health Canada and one member of the public on the draft Screening Report. No concerns were raised that would justify the consideration to refer the project to the federal Minister of the Environment.

57. The Commission therefore decides not to refer the project to the Minister of the Environment for referral to a review panel or mediator (i.e., pursuant to paragraph 20(1)(c) of the CEAA).

Conclusion

58. The Commission concludes that the environmental assessment Screening Report attached to CMD 06-H113 is complete and meets all of the applicable requirements of the *Canadian Environmental Assessment Act*.

59. 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.

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

61. 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: April 27, 2006
Date of release of Reasons for Decision: May 25, 2006