



Canadian Nuclear
Safety Commission

Commission canadienne
de sûreté nucléaire

Record of Proceedings, Including Reasons for Decision

In the Matter of

Applicant

Cameco Corporation

Subject

**Application to Renew the Class IB Nuclear Fuel
Facility Operating Licence for the Port Hope
Conversion Facility**

**Public Hearing
Dates**

November 3, 2011 and January 17 & 18, 2012

RECORD OF PROCEEDINGS

Applicant: Cameco Corporation

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

Purpose: Application to renew the Class IB Nuclear Fuel Facility Operating Licence for the Port Hope Conversion Facility

Application received: April 15, 2011

Dates of public hearing: November 3, 2011 (Day-1) and January 17 &18, 2012 (Day-2)

Location: Day 1: Canadian Nuclear Safety Commission (CNSC) Public Hearing Room, 280 Slater St., 14th. Floor, Ottawa, Ontario
Day 2: Town Park Recreation Centre, 62 McCaul Street, Port Hope, Ontario

Members present: M. Binder, Chair R. J. Barriault
A. Harvey M. J. McDill
D.D. Tolgyesi

Secretary: M. Leblanc
Recording Secretary: M. Young
General Counsel: L. Thiele

Applicant Represented By			Document Number
<ul style="list-style-type: none"> • A. Thorne, Vice-President, Fuel Services Division • D. Clark, General Manager, Port Hope Conversion Facility • R. Peters, Superintendent, Compliance and Licensing • C. Leavitt, Union President • A. Kodarin, General Manager, Cameco Chemical Fuel Manufacturing 			CMD 11-H16.1 CMD 11-H16.1A CMD 11-H16.1B CMD 11-H16.1C
CNSC staff			Document Number
<ul style="list-style-type: none"> • P. Elder • C. Purvis • R. Barker • K. Mann • R. Jammal 	<ul style="list-style-type: none"> • B.R. Ravishankar • M. Rinker • P. Thomspen • M. Ilin • D. Howard 	<ul style="list-style-type: none"> • J. Jaferi • S. Lei • K. Bundy • S. Faille 	CMD 11-H16 CMD 11-H16.A CMD 11-H16.B

Other Representatives
<ul style="list-style-type: none">• Municipality of Port Hope, represented by Mayor L. Thompson• Emergency Management Ontario, represented by D. Nodwell, K. Bleyer and L. Webb• Ministry of Environment, represented by J. Martherus, G. Faaren, N. Dyck, M. Dixon and V. Castro• Office of the Fire Marshall, represented by O. Lamerz
Intervenors
See appendix A

Licence: Renewed

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Introduction

1. Cameco Corporation (Cameco) has applied to the Canadian Nuclear Safety Commission¹ for the renewal of the Nuclear Fuel Facility Operating Licence (FFOL) for its Port Hope Conversion Facility located in Port Hope, Ontario. The current operating licence FFOL-3631.0/2012 expires on February 29, 2012. Cameco has applied for the renewal of this licence for a period of five years.
2. The Port Hope Conversion Facility is located within the Municipality of Port Hope, Ontario, situated on the north shore of Lake Ontario, approximately 100 km east of the city of Toronto, Ontario. The facility primarily converts uranium trioxide (UO₃) powder produced by Cameco's Blind River Uranium Refining Facility to uranium dioxide (UO₂), which is used to manufacture CANDU reactor fuel, and uranium hexafluoride (UF₆), which is exported for further processing into fuel for Light Water Reactors. In addition, there is a Specialty Metals plant, which has been used to cast uranium metal into shielding and counterweights for certain types of aircraft. The facility also includes recycling and decontamination capabilities along with a stand-by plant for further UO₂ production.
3. The facility comprises two sites. Site 1 consists of two areas situated between the railway viaducts and Lake Ontario, to the south of the main commercial and residential areas of the town. The first area borders the harbour and slip on the west side. The second area, the Centre Pier property, lies between the east side of the harbour and slip and the Ganaraska River. It has buildings used for storage of contaminated solid waste materials as well as an outside temporary storage facility for contaminated soils excavated from the municipal water treatment plant located to the west of Site 1.
4. Site 2 is located on Dorset St. East, a predominantly commercial/industrial area in the east part of the town. There are two buildings on this site in which contaminated solid waste materials are stored.
5. During the current licence period, Cameco experienced a major event at the UF₆ plant that resulted in the halt of production operations for about 18 months. A uranium leak was discovered in the ground underneath the floor of the UF₆ plant in July 2007. This matter was discussed with the Commission at a Meeting in August 2007, soon after the event occurred, and again in November 2009, during a mid-term performance report to the Commission. The two plants have since resumed their operations after extensive on-site soil remediation and the installation of a site-wide groundwater remediation system.
6. Cameco requested that the licence conditions not change from its existing licence.

¹ 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.

Issue

7. In considering the application, the Commission was required to decide, pursuant to subsection 24(4) of the *Nuclear Safety and Control Act*² (NSCA):
- a) if Cameco is qualified to carry on the activity that the licence would authorize; and
 - b) if, in carrying on that activity, Cameco would make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

Public Hearing

8. The Commission, in making its decision, considered information presented for a public hearing held on November 3, 2011 in Ottawa, Ontario and January 17 & 18, 2012 in Port Hope, Ontario. The public hearing was conducted in accordance with the *Canadian Nuclear Safety Commission Rules of Procedure*³. During the public hearing, the Commission considered written submissions and heard oral presentations from CNSC staff (CMD 11-H16, CMD 11-H16.A and CMD 11-H16.B) and Cameco (CMD 11-H16.1, CMD 11-H16.1A, CMD 11-H16.1B and CMD 11-H16.1C). The Commission also considered oral and written submissions from 97 intervenors (see Appendix A for a detailed list of interventions). Representatives from the Ontario Ministry of the Environment, Emergency Management Ontario and the Office of the Fire Marshall were also available for questions.

Decision

9. Based on its consideration of the matter, as described in more detail in the following sections of this *Record of Proceedings*, the Commission concludes that Cameco is qualified to carry on the activity that the licence will authorize. The Commission is of the opinion that Cameco, in carrying on that activity, will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed. Therefore,

the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews Cameco Corporation's Nuclear Fuel Facility Operating Licence for its Port Hope Conversion Facility located in Port Hope, Ontario. The renewed licence, FFO-3631.0/2017, is valid from March 1, 2012 to February 28, 2017.

² Statutes of Canada, S.C. 1997, c. 9.

³ Statutory Orders and Regulations, S.O.R./2000-211.

10. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 11-H16.B, with the following modifications:

- The expiry date of the licence is changed to February 28, 2017.
- Licence condition 4.4 is removed.

The Commission denies Cameco's request to retain existing licence condition 5.5 regarding the release of process waste water effluent. The Commission is of the view that Cameco has taken a positive step in removing these releases and encourages Cameco to avoid reverting to past practices. The Commission acknowledges the reasons for Cameco's request and notes that Cameco can apply for a licence amendment in the future if Cameco considers it absolutely necessary to resume this practice. The Commission expects that Cameco would submit a detailed proposal at that time.

11. The Commission delegates approval authority as described in the draft Licence Conditions Handbook that was submitted as attachment to CMD 11-H16.
12. With this decision, the Commission directs CNSC staff to prepare an annual industry report that includes the results of compliance activities carried out during the licence period pertaining to this facility. The report should also include detailed information on emissions and the movement of the groundwater plume on the Port Hope Conversion Facility site. CNSC staff shall present their report at a public proceeding of the Commission, in the fall of each year.

Issues and Commission Findings

13. In making its licensing decision, the Commission considered a number of issues relating to Cameco's qualification to carry out the proposed activities and the adequacy of the proposed measures for protecting the environment, the health and safety of persons, national security and international obligations to which Canada has agreed.

Management

14. The Commission examined issues related to the program areas of Management System, Human Performance Management and Operating Performance in order to assess the adequacy of the programs and efficiency of their implementation.

Management System

15. The Management System covers the framework that establishes the processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives and fosters a healthy safety culture.
16. CNSC staff reported that Cameco's Quality Management Program Manual and its procedures provided adequate management controls to ensure all processes are conducted in a safe manner and in compliance with CNSC regulatory requirements. CNSC staff noted that the facility is also registered to the ISO 14001:2004 Environmental Management System, which is an internationally recognized standard for environmental management.
17. CNSC staff stated that it conducted several inspections over the licence period. CNSC staff noted that it did not identify any significant safety issues, and other inspection findings were satisfactorily resolved. CNSC staff noted that it would continue to monitor the effectiveness of Cameco's corrective actions during compliance inspections.
18. CNSC staff stated that Cameco's performance regarding its management system was satisfactory over the licence period.
19. In its intervention, the Canadian Nuclear Association (CNA) expressed the view that Cameco's commitment to continual improvement is embedded in the ISO 14001:2004 Environmental Management System. In response to further information requested by the Commission, the CNA representative explained that this standard allows for companies to establish targets for improving environmental performance, which is beyond legislative requirements.
20. The Commission asked for more information concerning the implementation of the environmental management system. A Cameco representative responded that Cameco had been recently re-registered to the ISO 14001 standard but noted that some minor improvements could be made regarding documentation and the procedures for implementing the environmental management system. The Cameco representative noted that the ISO registrar conducts annual audits of the environmental management system, and re-registration occurs every three years. CNSC staff concurred that improvements could be made regarding documentation and noted that there were no issues regarding releases or monitoring.
21. The Town of Cobourg, in its intervention, expressed support for Cameco, noting the importance of an effective quality management system to ensure the safety of workers and the public.

22. Based on its consideration of the presented information, the Commission concludes that Cameco has appropriate organization and management structures in place to adequately carry out the activities under the proposed licence.

Human Performance Management

23. Human Performance Management encompasses activities that enable effective human performance through the development and implementation of processes that ensure that there is a sufficient number of staff in all relevant job areas, and that they have the necessary training, procedures and tools in place to safely carry out their duties.

Staffing

24. The CNSC requires all Class I nuclear facility licensees to maintain sufficient qualified personnel in attendance at the facility to ensure at all times the safe conduct of activities authorized by the licence. CNSC staff reported that Cameco has established minimum staffing levels which account for the safe operation of the UO₂ and UF₆ plants, emergency response and security. CNSC staff stated that it is satisfied that Cameco has met the required minimum staffing levels.
25. E.S. Fox Ltd., in its intervention, expressed support for Cameco and mentioned that each Cameco employee must obtain security clearance and pass a drug and alcohol screening test. The Commission asked for more information in this regard. A Cameco representative explained that Cameco performs background checks on employees for security purposes, as well as pre-employment substance abuse testing. Cameco's representative also noted that Cameco performs substance abuse testing to ensure that employees are fit for duty. The Cameco representative noted that the testing is based on cause from behavioural observation. The Cameco representative further noted that Cameco would address any issues on a case-by-case basis.

Training

26. Cameco provided information regarding its training programs. Cameco stated that it has a wide range of training programs that are standardized across all of its operations. Cameco noted that it has implemented a Systematic Approach to Training (SAT) that covers the initial training of employees, routine re-qualification, as well as re-qualification of employees after an extended absence.

27. CNSC staff stated that, during the licence period, Cameco developed and implemented a SAT-based training program for its UO₂ and UF₆ operators, as well as for other higher risk positions on-site. CNSC staff noted that Cameco had a series of events in 2009 following the restart of the UF₆ plant after a two-year shutdown. CNSC staff explained that operator error was determined to be a factor in many of these events and, as result, Cameco developed improved training and qualification procedures for UF₆ plant operators. CNSC staff stated that, following inspections, it was satisfied with the corrective actions taken by Cameco to address this issue and that it was satisfied with Cameco's SAT-based training program and implementation. CNSC staff noted that it would continue to monitor the training program and the progress made by Cameco in resolving any identified deficiencies.

Conclusion on Human Performance Management

28. Based on its consideration of the presented information, the Commission concludes that Cameco has appropriate programs in place and that current efforts related to human performance management provide a positive indication of Cameco's ability to adequately carry out the activities under the proposed licence.

Operating Performance

29. Operating Performance includes an overall review of the conduct of the licensed activities and the activities that enable effective performance at the PHCF.

Conduct of Operations

30. Cameco stated that it has robust systems in place to ensure that its ongoing performance is maintained and that it achieves continuous improvement. Cameco noted that it tracks its operating performance using a comprehensive set of key performance indicators and objectives.
31. CNSC staff stated that it conducted seven inspections each year over the licence period and noted that inspection findings were addressed, or were being addressed, by Cameco in a timely manner and in accordance with corrective action plans that were reviewed and accepted by CNSC staff. CNSC staff stated that it was satisfied that Cameco operated the facility in compliance with the CNSC's regulatory requirements during the licensing review period.
32. Regarding the completion of follow-up actions from the previous licence renewal hearing in 2006, CNSC staff stated that Cameco had satisfactorily addressed ten of the eleven items, and noted that the remaining action was for Cameco to determine specific goals for air emissions from the facility. CNSC staff further noted that Cameco had submitted an Air Emissions Management Strategy, and that CNSC staff would monitor the implementation of this strategy through routine compliance activities to ensure that the improvements are implemented.

Work Procedures

33. CNSC staff stated that, during the licence period, Cameco developed, enhanced and implemented several error-reduction processes, including Job Hazard Analysis, Hazards and Operability reviews, and Cameco's Incident Reporting System for incident reporting and investigation covering incident root causes and corrective actions for all aspects of the operation of the facility. CNSC staff noted that it assessed Cameco's performance in implementing these processes through inspections and reviews. CNSC staff further noted that deficiencies found during these reviews and inspections were adequately addressed by Cameco in a timely manner.

Reportable Events

34. Cameco stated that all reportable events were followed-up with an investigation and corrective action plan. Cameco provided information concerning four significant events that occurred during the licence period, including the subsurface contamination event at the UF₆ plant in 2007, the series of events following the restart of the UF₆ plant in 2009, an indoor spill of electrolyte in 2011 and an event where a worker's finger was lacerated, also in 2011.
35. CNSC staff stated that Cameco continues to report unplanned events as required by the NSCA, its regulations and the licence conditions. CNSC staff noted that Cameco promptly reported incidents related to plant operations, lost time injuries and action levels for environmental releases. CNSC staff further noted that Cameco investigated these incidents to determine their root causes and took necessary corrective actions to prevent their recurrence. CNSC staff stated that it is satisfied with Cameco's event detection, reporting, investigation process, and timely implementation of corrective actions and lessons learned to prevent such incidents in the future.
36. Regarding the significant events that occurred during the licence period, CNSC staff stated that in all cases, CNSC staff was satisfied that acceptable corrective actions were taken in a timely manner. For the events that occurred in 2011, CNSC staff noted that it has reviewed and accepted the corrective action plans and that it would verify their implementation as part of routine compliance inspections at the UF₆ plant.
37. Several intervenors, including individuals, the Canadian Coalition for Nuclear Responsibility and the International Institute of Concern for Public Health, expressed concerns regarding the events that occurred during the licence period. Intervenors were of the view that these events demonstrated that Cameco's operating performance was not satisfactory. The Canadian Coalition for Nuclear Responsibility suggested that the CNSC should penalize licensees with fines or other regulatory action to ensure accountability for performance.

38. The Commission asked for more information concerning the events and how they related to Cameco's operating performance. A Cameco representative described Cameco's corrective action plan and explained how it ranks events for significance using a number of factors, including health and environment impacts. Cameco's representative stated that Cameco was satisfied with its performance over the licence period, noting the focus on safety, health and the environment, and that releases were well below regulatory limits.
39. The Commission enquired about CNSC staff's ratings of the licensee's performance. CNSC staff provided information regarding its review of Cameco's performance over the licence period. CNSC staff noted that certain aspects of Cameco's performance were rated 'below expectations' at some points during the licence period because of events such as the subsurface contamination, which will be discussed later in this Record of Proceedings. CNSC staff further stated that Cameco had to acceptably resolve the issues in order to meet requirements. CNSC staff noted that the rating of "fully satisfactory" would only be given in situations when a licensee has industry-leading performance, and noted that all licensees must demonstrate continuous improvement. CNSC staff further stated that it would be producing an annual industry report similar to its annual report on power reactors, which would allow the Commission and members of the public to compare the performance of Class IB nuclear fuel facilities, including Cameco's.

Conclusion on Operating Performance

40. Based on its consideration of the presented information, the Commission concludes that the operating performance at the facility provides a positive indication of Cameco's ability to adequately carry out the activities under the proposed licence, and to provide adequate protection to the health and safety of persons and the environment.

Facility and Equipment

41. The Commission examined issues related to the program areas of Safety Analysis, Physical Design and Fitness for Service in order to assess the adequacy of the safety margins provided by the design of the facility.

Safety Analysis

42. Cameco described the safety analysis for the Port Hope Conversion Facility. Cameco explained that its safety analysis, which includes the Safety Report, fire hazards analysis and flood risk assessment, is a systematic evaluation of the potential hazards associated with the facility that considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards. Cameco noted that the Safety Report for the facility is used to assess hazards and potential risks to workers, the public and the environment from operations.

43. CNSC staff stated that Cameco has continued to maintain the safety analysis for operations at the Port Hope Conversion Facility. CNSC staff noted that Cameco's Safety Report for the site was revised in 2010 and accepted by CNSC staff. CNSC staff further noted that it conducted compliance inspections during the licence period, and verified that Cameco has maintained all the safety barriers and protective systems required to ensure that the facility would operate safely.
44. CNSC staff stated that because the operating licence for the facility allows small quantities of enriched uranium to be used on-site for research and development purposes, the use and handling of enriched material is controlled by a nuclear criticality safety program. CNSC staff noted that there were no reportable events during the current licensing period related to this safety program. Furthermore, CNSC staff proposed that the new licence include a licence condition for the program to meet the requirements of the 2010 CNSC regulatory document RD-327⁴. CNSC staff further proposed that the total amount of enriched uranium on-site be controlled, as reflected in the Licence Conditions Handbook for the facility.
45. CNSC staff further stated that it requested that Cameco review initial lessons learned from the earthquake in Japan and re-examine the existing safety analysis, with a focus on the defence-in-depth concept. CNSC staff noted that Cameco had submitted its analysis with an implementation plan for addressing any significant gaps. Cameco stated that its review confirmed that the facility is capable of mitigating accidents in a manner that is protective of the public, workers and the environment. Cameco noted its commitment to conduct additional modelling of beyond design basis events for inclusion in its pre-incident plans in early in 2012. The Commission is satisfied that an action plan has been submitted to the CNSC.
46. The Commission asked for more information concerning the use and storage of enriched uranium at the facility. A Cameco representative responded that the quantities of enriched uranium used at the research and development facility were very small, particularly because there was no current research underway. Cameco's representative noted that the quantities of enriched uranium are kept to a minimum and reiterated Cameco's commitment to safely manage enriched uranium.
47. Several intervenors, including Families Against Radiation Exposure, Port Hope Community Health Concerns Committee and the Canadian Coalition for Nuclear Responsibility, expressed concerns regarding the impact of a flood or other severe weather scenarios on the facility. The Commission asked for more information in this regard. A representative from Cameco responded that Cameco can quickly and safely shut down the facility in the event of an accident, and that Cameco uses a comprehensive defence-in-depth approach to prevent and mitigate accidents. Cameco's representative described the measures for defence-in-depth at the facility, including process controls, system controls, ongoing monitoring, physical barriers and containment. Cameco's representative noted the importance of emergency preparedness to respond to accidents, as well as Cameco's commitment to complete the modeling of beyond design basis accidents for inclusion in its emergency plan.

⁴ CNSC regulatory document RD-327, "Nuclear Criticality Safety", 2010.

48. The Commission addressed the issue of whether the facility is on the floodplain of the Ganaraska River and whether Cameco has taken into consideration the impact of climate change. Cameco responded that the Ganaraska Region Conservation Authority floodplain study determined that the facility is not on the floodplain. Regarding climate change, a Cameco representative noted that Cameco has incorporated measures to protect the facility from a flood beyond what is required. CNSC staff stated that it reviewed several scenarios, including the highest recorded flood in 1980 and the probable maximum flood, which would be three times higher than the 1980 flood. CNSC staff stated that under the probable maximum flood, some areas of the site would be flooded but no water would get into the buildings. CNSC staff further noted that water would be captured and contained on-site.
49. The Commission asked what the consequences of a worst-case accident could be. CNSC staff responded that the consequences would be low, noting that there is no criticality risk at the site, and that the only risk would be the potential spread of uranium. CNSC staff further noted that such an accident would be covered by the Safety Report.
50. Some intervenors, including individuals, the Canadian Coalition for Nuclear Responsibility, the Port Hope Community Health Concerns Committee, the East Toronto Youth Nuclear Group, the International Institute of Concern for Public Health and Families Against Radiation Exposure, expressed concerns that there was no “buffer zone” around the facility to protect the public from a potential accident at the site. The Commission asked Cameco to address this issue. A Cameco representative responded that a buffer zone was not required for the facility because the defence-in-depth approach used at the facility is protective of the public and the environment. The Commission asked CNSC staff to explain whether there is a regulatory requirement for the facility to have a buffer zone. CNSC staff stated that there is no requirement for a facility to have a buffer zone as long as there are sufficient controls in place to protect the public and the environment. CNSC staff noted that the Port Hope Conversion Facility has several layers of containment to prevent a release of hazardous materials.
51. On the basis of the information presented, the Commission concludes that the systematic evaluation of the potential hazards and the preparedness for reducing the effects of such hazards is adequate for the operation of the facility and the activities under the proposed licence. The Commission recognises that a buffer zone is not required for the facility and is satisfied that the facility does not pose an unreasonable risk to the health and safety of persons or the environment in its present location.

Physical Design

52. Physical Design relates to activities that impact the ability of structures, systems and components to meet and maintain their design basis, taking into account planned modifications and changes in the external environment over time.

53. CNSC staff reported that Cameco has an acceptable plant design and change control process in place. CNSC staff noted that Cameco has a formal agreement with an authorized inspection agency, the Ontario Technical Standard and Safety Authority (TSSA), for pressure retaining components at the facility, which ensures that Cameco's components are installed in accordance with technical standards. CNSC staff noted that the changes to the facility over the licence period included improved subsurface civil structures and liquid effluent collection systems in both the UO₂ and UF₆ plants, the replacement of the main stack for the UF₆ plant, the addition of HEPA⁵ filters at the UO₂ and UF₆ plants to reduce fugitive emissions, the expansion of hazardous substance and radiation monitors in the UO₂ and UF₆ plants, and installed additional fire protection systems in accordance with *NFPA 801*⁶ requirements. CNSC staff stated that it was satisfied with Cameco's performance in this regard.
54. The Commission asked for more information concerning design changes to the facility. Cameco responded that its change control procedure is used to assess all changes that occur within the facility. A Cameco representative explained that Cameco conducts risk assessments to determine the significance of changes and noted that more significant changes would have to go through an internal change control committee for approval, as well as the approval of CNSC staff. CNSC staff noted that the change control process is a formal process in the licence that Cameco is required to follow.
55. On the basis of the information presented, the Commission concludes that the ability of systems, components and structures to maintain their design basis is adequate for the operation period included in the proposed licence.

Fitness for Service

56. Fitness for service includes preventative maintenance and in-service inspection and testing. Preventative maintenance ensures that the structures, systems and components remain effective over time. The in-service inspection and testing program applies to piping and vessels on-site that may deteriorate over time as a result of the conditions in which they operate.
57. Regarding maintenance, CNSC staff stated that the requirements for Cameco's Preventative Maintenance program for the safety related operating equipment is documented in the Quality Management Program Manual. CNSC staff noted that Cameco satisfactorily maintained its equipment over the licence period, and that Cameco's Preventative Maintenance program meets requirements.
58. Regarding the in-service inspection and testing program, CNSC staff reported that the Cameco technicians who carry out these inspections are certified in accordance with the Canadian General Standards Board. CNSC staff stated that Cameco properly addressed the issues identified during these inspections over the licence period.

⁵ High-Efficiency Particulate Air filters

⁶ National Fire Protection Association, *NFPA 801: Standard for Fire Protection for Facilities Handling Radioactive Materials*, 2008 edition

59. One intervenor, a former Cameco employee, raised several concerns regarding the condition of equipment. The intervenor submitted a list of concerns and made several recommendations. The Commission asked Cameco to address these comments. The representative from Cameco disagreed with many of the intervenor's concerns and responded to each item raised. The Cameco representative noted that Cameco encourages its employees to have a questioning attitude and to raise concerns, and that Cameco strives for continuous improvement to address any issues. CNSC staff also disagreed with the intervenor's concerns. CNSC staff noted that it follows up on inspection action items and ensures that Cameco's corrective action program is being followed.
60. The Commission asked for information regarding the safety significance of the issues raised by the intervenor. CNSC staff responded that the safety significance is low because there are safety systems in place to ensure that there are no releases to the environment in the event of component failure. CNSC staff noted that it would follow up on the intervenor's concern regarding the qualification of Cameco's inspection personnel responsible for the re-certification of the UF₆ shipping cylinders.
61. The Commission is satisfied that Cameco adequately addressed the issues raised by the intervenor. The Commission is satisfied that Cameco's corrective action process is in place to address any issues that may arise from preventative maintenance and in-service inspection and testing over the course of the licence period.
62. The Commission is satisfied with Cameco's programs for the inspection and life-cycle management of key safety systems. Based on the above information, the Commission concludes that the equipment as installed and maintained at the Port Hope Conversion Facility is fit for service.

Core Control Process

63. The Commission assessed the adequacy of the programs and efficiency of their implementation and examined issues related to the following program areas:
- Radiation Protection;
 - Conventional Health and Safety;
 - Environmental Protection;
 - Emergency Management and Response;
 - Waste Management;
 - Security;
 - Safeguards and Non-Proliferation; and
 - Packaging and Transport.

Radiation Protection

64. Radiation Protection covers the licensee's implementation of its radiation protection program in accordance with the *Radiation Protection Regulations*⁷. This program must ensure that radiation doses to persons and contamination are monitored and controlled As Low As Reasonably Achievable (ALARA), social and economic factors being taken into account.
65. The radiological exposures to workers associated with the operation of the facility are due to alpha, beta and gamma radiation emitted by the material being processed, natural uranium compounds. Cameco has designated all employees at the Port Hope Conversion Facility as Nuclear Energy Workers. Nuclear Energy Workers that have the potential to incur an effective dose in excess of 5 mSv are required to be monitored by a licensed dosimetry service, in accordance with the *Radiation Protection Regulations*.

Protection of Workers from Radiation

66. Cameco described its radiation protection program. Cameco explained that the facility is divided into three radiological safety zones with established barriers, including shielding, mandatory personal protective equipment and designated respirator-use, to ensure worker protection. Cameco noted that a combination of action levels, staff training and dose management tools, such as work planning and supervision, are used to further ensure radiation doses to workers are kept below regulatory levels and ALARA.
67. Cameco stated that during the licensing period no worker at Cameco PHCF received an effective or equivalent dose that exceeded the regulatory dose limits pursuant to the *Radiation Protection Regulations*. Cameco explained that the maximum individual effective and equivalent dose for workers during the licence period was 7.8 millisieverts per year (mSv/y) and 29.1 mSv/y, respectively, which were approximately 15.6 % and 5.8% of the of the annual regulatory dose limits of 50 mSv/y for effective dose and 500mSv/y for equivalent dose. Cameco further stated that, for the five-year dosimetry period from 2006 to 2010, the maximum cumulative effective dose to a worker at the facility was 35.7 mSv, which was 36 % of the regulatory limit of 100 mSv/5 years.
68. CNSC staff stated that it is satisfied that Cameco is adequately controlling radiation doses to workers, and that Cameco's radiation protection program meets requirements.
69. Several intervenors, including Cameco employees and unions, expressed support for Cameco's radiation protection program. Intervenors noted that Cameco follows the ALARA principle and monitors employee doses.

⁷ SOR/2000-203.

70. The Commission asked for more information concerning the application of the ALARA principle at the facility. CNSC staff responded that the objective of the ALARA principle is for licensees to decrease the dose to workers and the public, as well as contamination levels within the facility, through administrative controls and design and engineering controls. CNSC staff noted that licensees are expected to strive for continuous improvement in this regard. CNSC staff stated that it is satisfied with Cameco's efforts to keep doses ALARA.
71. The Port Hope Community Health Concerns Committee, in their intervention, expressed concerns on the lack of monitoring of past employees. The Commission asked for comments on this topic. The Cameco representative explained that, while there is no follow-up program for former employees, there is a program in place for the monitoring of dose levels for all existing employees. CNSC staff concurred with Cameco, and noted that Cameco's radiation protection program includes extensive monitoring of employees for radiation exposure, and that all of this information is collected by CNSC staff and sent to the National Dose Registry.
72. The same intervenor expressed the view that there is a lack of cohort and case-controlled studies in the Port Hope area, and that more studies need to be done. The Commission asked for CNSC staff's comments on this topic. CNSC staff explained that the CNSC information document INFO-0781⁸ does include the cohort and case-controlled studies that were done previously on nuclear energy workers in the Port Hope area. CNSC staff also noted that cohort and case control studies in a residential setting where radiation exposures are very low were not done because there was no individual exposure information. CNSC staff noted, however, that the Port Hope Synthesis Report includes a case control study of residential radon exposure.
73. Physicians for Global Survival, in its intervention, estimated that, statistically, three out of 100 nuclear energy workers would get cancer from exposure to occupational radiation at the regulatory limit of 20 mSv. Other intervenors raised similar issues regarding low doses of radiation. The Commission asked for more information on this subject. CNSC staff explained that the intervenors were using the linear no-threshold (LNT) relationship to calculate the probability of cancer among workers exposed at low doses of radiation. CNSC staff noted that this is not an appropriate use of this model, which is used by many international organizations, including the International Commission on Radiological Protection and the United Nations Scientific Committee on the Effects of Atomic Radiation. CNSC staff added that no workers in Canada receive exposures at the regulatory limits because of the implementation of radiation protection programs and ALARA requirements and, as such, the theoretical risk to those workers would be much lower. CNSC staff also pointed out the numerous studies that find no increase of cancer in Nuclear Energy Workers.

⁸ CNSC Information Document INFO-0781, *Understanding Health Studies and Risk Assessments Conducted in the Port Hope Community from the 1950s to the Present*, April 2009.

Protection of the Public from Radiation

74. Cameco provided information regarding the protection of the public from radiation. Cameco stated that the potential sources for radiation doses to the public from the facility are from intakes of air and water and exposure to gamma radiation, and noted that these sources were controlled and monitored in accordance with its environmental and radiation protection programs. Cameco explained that environmental monitoring results were used to determine the public dose rate for a hypothetical member of the public (critical receptor) living near the facility who would receive the maximum exposure to radiation from the facility. Cameco stated that the maximum calculated annual effective dose to the critical receptor for the main site of the facility was 0.064 mSv in 2007, which is 6.4 % of the regulatory public dose limit of 1 mSv/y, and well below the licence limit of 0.3 mSv/y.
75. CNSC staff stated that it is satisfied that no member of public received a dose that approached or exceeded the regulatory limit of 1 mSv /y or the more restrictive licence limit of 0.3 mSv/y. CNSC staff stated that it is satisfied that Cameco is adequately controlling radiation doses to members of the public.
76. Many intervenors, including individuals, Physicians for Global Survival, the Port Hope Community Health Concerns Committee, the Canadian Coalition for Nuclear Responsibility, the International Institute of Concern for Public Health and Families Against Radiation Exposure, expressed concerns regarding the risks associated with radiation. Intervenors were concerned about the potential health effects associated with exposure to radiation and suggested that there is no safe dose of radiation.
77. McMaster University, in its intervention, expressed the view that the low levels of radiation from Cameco's operations are not harmful to human health or the environment. The McMaster representative explained that the dose to members of the public from the facility is less than the dose they would receive from background radiation and medical exposures, and noted that the LNT model is conservative.
78. CNSC staff noted that the radiation protection requirements in Canada are based on international requirements and are well within the safe limits of any exposure to radiation. CNSC staff stated that it uses the LNT model as the basis for the dose limits and the ALARA requirements in its *Radiation Protection Regulations*. CNSC staff further stated that the regulatory limits are far below levels where health effects have been observed in studies and are protective of all members of the public, including infants.
79. Physicians for Global Survival noted the higher incidence of cancer of the trachea, bronchus and lung in Port Hope as found in CNSC information document INFO-0781, and suspected that this was caused by inhaled contaminants from the nuclear industry. The Commission asked for more information on this topic. CNSC staff responded that the increased incidence of cancer is not unique to Port Hope but is also found in the

whole Northumberland County, and that it is considered by the regional public health agency to be primarily caused by smoking. CNSC staff added that, having done a review of the scientific literature, these types of cancer are not typical of exposure to the low levels of uranium found in Port Hope.

80. Physicians for Global Survival also expressed the view that the current Canadian standard for tritium in drinking water of 7,000 Bq/L is not protective of the population. In response to comments requested by the Commission on this topic, CNSC staff explained that the current Canadian standard is based on the recommendation from the World Health Organization and that Health Canada considers it to be safe. CNSC staff noted that the nuclear facilities in Port Hope do not release tritium in the atmosphere.
81. Physicians for Global Survival suggested that the CNSC should use epidemiological data from more populated areas such as in Europe to determine health effects from exposure to releases from nuclear facilities, citing the German KiKK study that found elevations of childhood leukemia around nuclear power plants. The Commission asked for more information on this statement. CNSC staff explained that the German Radiation Protection Institute formed a committee of experts to review this study. This committee determined that there was no relationship between the cluster of childhood leukemia near the Krümmel power plant and radiation exposure. CNSC staff noted the existence of many other childhood leukemia clusters that are not near nuclear power plants. CNSC staff cited another French study concluding that there is no relationship between childhood leukemia and radiation exposure near nuclear power plants. CNSC staff also pointed out that no increase in childhood leukemia has been found in Port Hope.
82. In their intervention, the Port Hope Community Health Concerns Committee reported the results of a peer review by Dr. Mintz of two Health Canada studies, concluding a significant increase of cancer among the residents of Port Hope. The Commission asked for more information on this topic. CNSC staff responded that they thoroughly reviewed Dr. Mintz's interpretation of the data. CNSC staff disagreed with Dr. Mintz's conclusion that there was no information on exposures of the members of the public in Port Hope, and stated that this information is available since credible, independent experts for the federal government had performed extensive dose reconstruction and evaluation work. CNSC staff also stated that the numerous health studies of the residents of Port Hope have shown that there is no increased risk resulting from radiation exposures in this area.
83. One intervenor expressed concerns regarding Cameco's Site 2 waste storage area, located on Dorset St. East. The Commission asked for more information regarding the hazards associated with this site. A Cameco representative responded that scrap and waste materials are safely stored in drums at the site, which is a licensed facility that meets radiation protection requirements. CNSC staff concurred, noting that the radiation levels are low and that CNSC staff inspects the site on a quarterly basis.

Conclusion on Radiation Protection

84. Given the preceding discussion regarding the health effects associated with radiation exposure, the Commission is satisfied that the regulatory limits are protective of human health. Furthermore, the Commission is satisfied that the implementation of the radiation protection program and ALARA requirements ensure that the doses received by workers and members of the public are well below the regulatory limits. Regarding health studies, the Commission is satisfied with CNSC staff's findings that there is no increased risk to the residents of Port Hope associated with the operation of Cameco's facilities.
85. Based on this information, the Commission is of the opinion that, given the mitigation measures and radiation protection programs that are in place to control hazards, Cameco will provide adequate protection to the health and safety of persons and the environment.

Conventional Health and Safety

86. Cameco stated that it has established conventional health and safety policies and programs for the facility, including training, to ensure the protection of workers from physical, chemical and radiation hazards. Cameco noted that it has a Workplace Health and Safety Committee and a Policy Health and Safety Committee, in conformance with the Human Resources and Skills Development Canada (HRSDC) regulatory requirements. Cameco also provided information regarding lost-time injuries. Cameco stated that there were six lost-time injuries over the licence period.
87. CNSC staff noted that, in addition to the NSCA and its regulations, Cameco's activities and operations must comply with Part II of the *Canada Labour Code*⁹ and other applicable federal and provincial health and safety related acts and regulations. CNSC staff further noted that the regulation of conventional health and safety at the facility involves HRSDC, which has the lead role and applies its regulatory requirements, and the CNSC. CNSC staff further noted that it takes an overview role, monitors compliance with its regulatory reporting requirements and, on occasion, consults with HRSDC staff if any issues are identified.
88. CNSC staff stated that it was satisfied with Cameco's performance regarding conventional health and safety. CNSC staff stated that Cameco addressed all inspection findings in a timely manner and in accordance with a corrective action plan that was reviewed and accepted by CNSC staff.
89. The Commission enquired about the management of Cameco's occupational health and safety programs. A Cameco representative responded that Cameco added three full-time positions to its workforce to provide oversight and implement the health and safety programs. Cameco's representative noted that the health and safety workers are

⁹ R.S.C., 1985, c. L-2.

trained and certified. Cameco's representative further noted that Cameco has a joint health and safety committee with representation from the labour union and staff representatives.

90. The Commission asked about the lost-time injuries that occurred over the licence period. A Cameco representative responded that the individuals had all returned to work with no residual health effects. Cameco's representative noted that they had only minimal time away from work. The Cameco representative further stated that Cameco also tracks injuries that require medical treatment, and that it includes all employees and contractors working on the site in its statistics.
91. The Commission noted the relatively high frequency of hand injuries in Cameco's statistics and asked for more information regarding corrective actions to address this issue. The Cameco representative responded that Cameco had identified the trend regarding hand injuries and raised awareness of this issue at the facility. Cameco's representative stated that Cameco had conducted personal protective equipment assessments to ensure that the proper type of gloves is being used for specific tasks.
92. The Commission asked about communication between workers in the event of an accident. Cameco's representative responded that employees carry radios and there is a dedicated internal phone system with multiple locations in the vicinity of critical safety systems. The Cameco representative further responded that some areas of the facility have alarm indicators for the safety showers.
93. Several intervenors, including United Steelworkers Local 13173, United Steelworkers Local 8562, Canadian Nuclear Workers Council, the Northumberland Labour Council and Cameco employees, expressed the view that the Port Hope Conversion Facility was a safe workplace. The intervenors emphasized the importance of occupational health and safety at the facility. The Commission asked about the relationships between Cameco's management and labour unions. The unions responded that there is a positive relationship and noted that the health and safety committee works to resolve issues that employees may have. A Cameco representative agreed with the intervenors and noted the strong safety culture at the facility.
94. The Commission is satisfied that the health and safety of workers and the public was adequately protected during the operation of the facility for the current licence period, and that the health and safety of persons will also be adequately protected during the continued operation of the facility.

Environmental Protection

95. CNSC regulations require that every licensee take all reasonable precautions to protect the environment and control the release of nuclear and hazardous substances into the environment.

96. Cameco stated that it maintains a comprehensive Environmental Protection Program at the Port Hope Conversion Facility, including policies, methods and procedures to identify, control and monitor all releases of nuclear and hazardous substances into the environment, and to protect the environment. Cameco noted that it is registered to the ISO 14001 Environmental Management System standard.
97. CNSC staff noted that, following the discovery of the UF₆ plant leak and subsequent subsurface contamination, CNSC staff required Cameco to do a complete review of its environmental compliance monitoring program to reflect the environmental conditions throughout the site and implement adequate monitoring and mitigation systems. CNSC staff stated that it is satisfied that Cameco has addressed this issue and noted that Cameco has complied with regulatory requirements.

Effluent Monitoring

Air Emissions

98. Cameco described the systems it has in place to control air emissions in the UF₆ and UO₂ plants, including scrubbers, ventilation, dust collection and HEPA filters. Cameco stated that its air emissions monitoring program consists of source and ambient monitoring, and that uranium and ammonia samples are analyzed on a daily basis. Cameco explained that it continuously samples the main UF₆ and UO₂ stacks for uranium, and the main UO₂ stack for ammonia. Cameco noted that fluoride emissions from the main UF₆ stack are sampled and analyzed on a continuous basis. Cameco further noted that the incinerator at the facility was permanently taken out of service.
99. Cameco stated that its air emission discharges were well below the emissions limits over the licence period. Cameco noted that there were five exceedances of an action level at the UO₂ plant main stack during the licensing period. Cameco explained that three exceedances were due to a correction factor being applied to past monitoring results following a third-party review of uranium emissions that showed that the results had been low. Cameco noted that another was due to a contaminated probe being used during stack probe maintenance. Cameco stated that the final action level exceedance was due to uranium material that had built up on a dryer fan housing and adjacent ducting being disturbed and released. Cameco noted that it implemented corrective and preventive measures to address these issues. Cameco further noted that emissions were well below the CNSC regulatory limit of 150 g of uranium per hour at all times.
100. Following a request from CNSC staff to review its action levels, Cameco proposed to amend the action levels from the main stacks of the UF₆ and UO₂ plants to be more stringent, with the exception of the action level for uranium from the UO₂ plant, which would remain the same. Cameco noted that the Port Hope Conversion Facility is regulated for air emissions, including noise, by the Ontario Ministry of the Environment (OMOE) under a Certificate of Approval in accordance with the Ontario *Environmental Protection Act*¹⁰.

¹⁰ O. Reg. 419/05

101. CNSC staff stated that it is satisfied that air emissions from the facility were effectively controlled and well below their respective licence limits for the licence period. CNSC staff noted that the current uranium emission licence limits are equivalent to a dose of 50 μSv to the most exposed member of the public, and that these licence limits are consistent with international practice and other CNSC licences.
102. Several intervenors, including Cameco employees, expressed the view that releases to the environment are minimal, and that Cameco makes the environment a priority and is dedicated to reducing these releases as much as possible.
103. The Commission asked for more information concerning the third-party review of emissions that led to the correction factor being applied to past emissions. Representatives from Cameco responded that when Cameco conducted sampling concurrent with the third-party, the third-party was measuring consistently higher emission rates coming out of the UO_2 main stack. Cameco representatives stated that Cameco retroactively applied the correction factor to ensure that all of its results were consistent with the third-party measurements, effective January 1, 2009. A Cameco representative noted that the three days when an action level was exceeded were days where maintenance work was being done on emissions control equipment. CNSC staff stated that it was satisfied with the measures taken by Cameco to address this issue.
104. CNSC staff noted that, in June 2011, the OMOE announced that a new air standard for uranium would take effect on July 1, 2016. CNSC staff explained that the new standard would be for an annual average concentration of $0.03 \mu\text{g}/\text{m}^3$ for uranium and uranium compounds in particulate matter less than 10 micrometers in diameter. CNSC staff noted that Cameco committed to conduct additional modeling and assessment once guidance for modeling is finalized by the OMOE. CNSC staff further stated that, given the current low releases from the Port Hope Conversion Facility, CNSC staff expects Cameco to comply with the future ambient air standard.
105. The Commission asked for more information concerning the new standard. A Cameco representative responded that Cameco's current operations meet the standard and that Cameco is confident that it would meet the new requirement in the future. A Cameco representative explained that the OMOE is currently developing guidance for the new standard and, once that guidance is available, Cameco would apply for a renewal of its Certificate of Approval under the new limit. Cameco's representative noted that Cameco would continue operating under its existing Certificate of Approval until that time.
106. Regarding noise, Cameco stated that it undertook a number of initiatives to reduce the noise generated by the facility in 2011, including adjustments to the outdoor paging system, the installation of silencers and acoustical louvers on selected stacks and exhausts and replacing outdoor motors.

107. One intervenor expressed concerns regarding the noise generated by operations at the facility. The Commission asked for more information on this subject. A Cameco representative responded that Cameco has met with neighbouring members of the public to discuss noise and noted the initiatives it has taken to reduce noise levels. Cameco's representative noted that noise levels are regulated by the OMOE under a Certificate of Approval.

Water Emissions

108. Cameco stated that it does not discharge any liquid process effluent to the Port Hope harbour or Lake Ontario. Cameco explained that, in 2007, it ceased discharging liquid effluent to the Port Hope harbour by using a combination of rerouting and reusing liquid within the process, and venting the waste recovery evaporator steam to the atmosphere. Cameco noted that other liquid discharges from the facility include once-through, non-contact cooling water, which was approved pursuant to a Permit to Take Water and a Certificate of Approval granted by the OMOE, a sanitary sewer discharge that meets the requirements of the municipal by-law, and stormwater and groundwater discharges from the facility. Cameco noted that all of these discharges are monitored in accordance with the site environmental management program.
109. Despite the fact that it had not been releasing any liquid process effluent, Cameco proposed that its operating licence retain the existing licence condition 5.5 and limits for process water effluent. Cameco explained that it wished to retain the flexibility to do so due to the increased demand on its water treatment facility from its groundwater treatment wells. Cameco noted that it was evaluating additional treatment processes, employing technologies such as reverse-osmosis, which may require the re-establishment of a treated process liquid effluent discharge. Cameco proposed to submit information regarding the new treatment process and propose action levels for CNSC staff acceptance and incorporation into the Licence Condition Handbook (LCH) prior to re-establishing the treated process liquid effluent discharge. Cameco noted that there would be no liquid effluent discharges until they had been reviewed and accepted by CNSC staff.
110. CNSC staff stated that it reviewed Cameco's request and determined that the Commission could reinstate the current licence limits for liquid effluent releases, provided that appropriate action levels can be set. CNSC staff noted that the current liquid effluent release limits are protective of the environment. CNSC staff further noted Cameco's commitment not to make any changes to its existing activities until CNSC staff has accepted the proposed treatment process and associated action levels. In this regard, CNSC staff proposed that the Licence Conditions Handbook could provide for Cameco to provide notification, including information on alternate treatment processes and proposed action levels for CNSC staff approval, at least two months prior to releasing any liquid effluent. CNSC staff added that Cameco would also need to get the appropriate authorizations from the OMOE.

111. Lake Ontario Waterkeeper, in its intervention, proposed that Cameco's licence should not include a condition permitting the discharge of treated process water. Lake Ontario Waterkeeper suggested that Cameco should not revert to discharging process water without first returning to the CNSC for a licence amendment and notifying the public.
112. The Commission questioned the need to keep the licence condition and asked for more information on the subject. A Cameco representative responded that, due to the implementation of the pump and treat system and the added groundwater treatment wells around the facility, Cameco is close to the capacity of its existing water treatment facilities. The Cameco representative explained that because Cameco may implement a new treatment technology to address the increased treatment volume, Cameco would require the flexibility to release treated effluent. Cameco's representative emphasized that Cameco's proposal was to release treated water from the site in accordance with the existing, safe licence limits and noted that Cameco had operated to those standards in the past.
113. The Commission sought further information regarding Cameco's existing treatment technology. A Cameco representative responded that Cameco currently uses an evaporation system to treat the water, and noted that the emissions from that system are controlled within site limits through the emission management program. Cameco's representative noted that that system is near 90 percent capacity and noted Cameco's request would ensure that the system can operate reliably if there is an increased volume of water to be treated at the facility. The Cameco representative noted that Cameco is looking at other options, such as reverse osmosis, which would be more energy-efficient but would require a treated liquid effluent release.
114. During the discussion at the hearing, CNSC staff stated that it agreed with the position of Lake Ontario Waterkeeper that, rather than include the condition in the licence, Cameco could apply for a licence amendment to resume the discharge of treated process water effluent once it has submitted the information on alternate treatment processes and proposed action levels for CNSC staff approval. The Commission agrees with this proposal.
115. The Commission finds that it is not necessary for Cameco to retain the existing licence condition regarding the release of process waste water effluent. The Commission is of the view that Cameco has taken a positive step in removing these releases and encourages Cameco to avoid reverting to such past practices. The Commission acknowledges the reasons for Cameco's request and notes that Cameco can apply for a licence amendment in the future if Cameco considers it absolutely necessary to resume this practice. The Commission expects that Cameco would submit a detailed proposal at that time.

Subsurface Contamination

116. Cameco stated that, in response to the finding of subsurface contamination at the UF₆ plant in 2007, Cameco completed a site-wide environmental investigation to characterize soil and groundwater contamination on-site in 2008. Cameco noted that it also developed a new groundwater monitoring program. Cameco stated that as part of its investigation and remediation of the subsurface contamination, it installed new liquid management infrastructure in the UF₆ and UO₂ plants, and installed groundwater collection and control systems. Cameco noted that it submitted groundwater and surface water monitoring reports to the CNSC and OMOE.
117. Cameco further stated that it completed a site-wide risk assessment in 2008, which was updated in 2009 and 2010, following the implementation of a Site-Wide Environmental Management Plan. Cameco noted that it has demonstrated that, with the groundwater control measures in place, there is no unreasonable risk to employees, the public or the environment from subsurface contamination on-site.
118. CNSC staff noted that, in consideration of the ALARA principle, the objective of the Site-Wide Environmental Management Plan was to build upon the existing environmental management program by identifying additional means to further reduce contaminant discharges to the Port Hope Harbour and Lake Ontario to levels as low as reasonably achievable. CNSC staff noted that the installation of four additional pump-and-treat wells was identified as the preferred option for reducing contaminant discharge to the harbour, and that these wells were successfully installed and began operating in 2011.
119. Cameco stated that the pump-and-treat system has two purposes. Cameco explained that the primary purpose of the pump-and-treat system is to ensure that the subsurface contamination beneath the UF₆ plant remains in place by maintaining a zone of groundwater capture around the building, and that the second purpose is to reduce the overall contaminant loadings to the harbour from the groundwater by reducing the total volume of groundwater that reaches the harbour. Cameco noted that the pump-and-treat system is reducing the total flow of groundwater to the harbour by approximately 40 percent and would reduce the total loading of uranium to the harbour by approximately 70 percent from pre-pumping conditions. Cameco further noted that the monitoring program is used to ensure that the pump-and-treat system meets these objectives, and is reviewed on an annual basis.
120. CNSC staff stated that it is satisfied that human health and the environment are not at risk from contaminant discharges from the site.
121. The Commission asked for more information regarding the movement of the contamination plume in the groundwater. In its submission for Day 2 of the hearing, Cameco presented figures that showed the movement of the groundwater plume on the site. Cameco explained that the 13 groundwater collection wells of the pump-and-treat

system were achieving the objectives of the Site-Wide Environmental Management Plan. Cameco noted that the collection wells were maintaining the zone of capture around the UF₆ plant, and are also controlling groundwater flow in the areas of the former UF₆ plant and the UO₂ plant.

122. The Commission sought more information regarding the effectiveness of the pump-and-treat system. A Cameco representative responded that the pump-and-treat system has worked as intended by maintaining the zone of capture around the buildings and reducing the movement of contamination into the harbour. Cameco's representative further stated that Cameco monitors the effectiveness of the system through its groundwater monitoring program, which is also reviewed by the CNSC and the OMOE. Cameco's representative noted that Cameco would continue to operate the pump-and-treat system for the foreseeable future. CNSC staff stated that the monitoring provides information regarding the amount of contamination being removed from the groundwater. CNSC staff further stated that although the buildings have been remediated and the source of contamination has largely been removed, it is expected that the system would remain in operation until the Port Hope Conversion Facility is decommissioned.

Stormwater Management

123. Cameco stated that it would implement a new stormwater monitoring program based upon the findings of the storm water control study conducted in 2009 and 2010. In addition, Cameco's Vision 2010 project is anticipated to begin addressing the legacy buildings and subsurface contamination at the facility. It is expected that this should further improve groundwater and storm water discharges from the site.
124. Lake Ontario Waterkeeper, in its intervention, noted that the amount of uranium in Cameco's stormwater is more than double the CNSC's Optimization Screening Objective of 100 micrograms per litre (µg/L), and is significantly higher than the discharged process effluent from any uranium mine or mill in Canada. Lake Ontario Waterkeeper proposed that Cameco should stop discharging contaminated stormwater to Lake Ontario. Lake Ontario Waterkeeper also suggested that Cameco should collect and test stormwater prior to discharge and ensure that releases meet standards that are protective of the environment.
125. The Commission asked for more information regarding the submission made by Lake Ontario Waterkeeper. A Cameco representative responded that stormwater management is included in its commitments with the OMOE. Cameco's representative stated that the site-wide environmental risk assessment determined that there was no risk to the public or the environment associated with stormwater discharges. Cameco's representative noted that stormwater management would continue to be a key component of Cameco's environmental management plan. CNSC staff concurred that there was no risk associated with stormwater releases and noted that releases of uranium from stormwater are around two to three percent of the risk assessment criteria. CNSC staff stated that it was satisfied that Cameco was following the OMOE requirements for stormwater.

126. Regarding the Optimization Screening Objective of 100 µg/L, CNSC staff responded that CNSC uses this design objective for treatment of effluent containing uranium. CNSC staff stated that although the uranium in stormwater has been measured to concentrations of about 218 µg/L, the total volume going to Lake Ontario is small, much less than any mining operation annual discharge. CNSC staff further stated that there is no adverse impact to Lake Ontario as a result. CNSC staff noted that stormwater management would be included in the Vision 2010 project.
127. The Commission asked for more information from the OMOE. A representative from OMOE responded that although Cameco does not currently have a Certificate of Approval for stormwater discharges, any changes to the stormwater management plan would require a Certificate of Approval. A Cameco representative noted that Cameco would be submitting information to the OMOE regarding the new stormwater monitoring program later in 2012.

Environmental Monitoring

128. Cameco described its environmental monitoring plan. Cameco noted that this plan includes monitoring of emissions to air, water and land. Cameco explained that, in addition to monitoring air emissions, stormwater and groundwater, Cameco samples ambient water quality, as well as vegetation and soil at locations around the facility and in the local area.
129. CNSC staff stated that, based on the monitoring of fluoride-sensitive vegetation in the environment, there is no significant impact on vegetation due to fluoride emissions from the facility.
130. CNSC staff provided information regarding soil monitoring. CNSC staff stated that, based on measurements taken in the Port Hope Waterworks parking lot monitoring location adjacent to the facility, which had been remediated with clean soil, there is no measurable impact on soil due to current uranium emissions from the facility in Port Hope.
131. The Port Hope Community Health Concerns Committee, in its intervention, expressed the view that there is no regular independent monitoring of Cameco's emissions and of the surrounding environment. This intervenor also stated that the OMOE should be involved in the environmental monitoring of Cameco's facilities in the Port Hope area. The Commission asked for comments on this topic. CNSC staff explained that Cameco's environmental monitoring program is thoroughly reviewed to ensure that the data submitted is credible. CNSC staff also noted that, using the new CNSC laboratories, a CNSC environmental monitoring program would begin the next fiscal year. CNSC staff confirmed that Cameco's environmental monitoring program includes sampling on the surface and at deeper levels to confirm that there is no accumulation of uranium in the surface soil.

132. The Commission sought further information from the OMOE. The OMOE representative commented that they performed soil sampling in the Port Hope area in 1986 and in 2000, and noted a decrease of uranium concentration in soil over time. The OMOE representative explained that this decrease is caused by soil movement and leaching, and because the uranium releases from the Cameco facilities are small. The OMOE representative also described soil sampling programs around the Port Hope Town Hall, where no measurable changes in concentration were noted, and in Marina Park, where there were variations in uranium concentration over time attributed to sample contamination. The OMOE representative also described the last sampling program in the new Port Hope waterworks that started in 2005. The OMOE representative noted that the results to date do not show any evidence of uranium accumulation. The OMOE representative further noted that natural variability of uranium in soil make evidence of uranium accumulation difficult to obtain.
133. Regarding groundwater, CNSC staff stated that groundwater quality across the site is improving. CNSC staff noted that levels of uranium, fluoride, ammonia, nitrate and arsenic removed from the groundwater pumping wells have decreased over the licence period. CNSC staff stated that it is satisfied that the pumping wells continue to remove these contaminants before they reach the harbour. CNSC staff noted that Cameco has planned to install new pumping wells for the area around the original UF₆ plant.
134. CNSC staff stated that surface water is sampled in the Port Hope harbour at thirteen locations, including samples just below the water surface and just above the harbour sediment layer at each location. CNSC staff noted that the cooling water intake located in the Port Hope harbour near the mouth of the Ganaraska River is also monitored on an ongoing basis. CNSC staff further stated that the surface water quality in the harbour adjacent to the facility has been monitored since 1977 and has shown improvement in that time.
135. CNSC staff reported that the concentrations of parameters analyzed in the surface water in the harbour meet the provincial water quality objectives, with the exception of uranium, which has slightly exceeded the interim objective of 5 µg/L on occasion, at some locations. CNSC staff noted that the proposed Port Hope Area Initiative project is intended to clean the harbour and the surrounding areas, and that CNSC staff have asked Cameco to coordinate with other stakeholders, including the Municipality and the Port Hope Area Initiative, in order to prevent future recontamination of the harbour from Cameco's operations.
136. CNSC staff stated that it was satisfied that Cameco adequately compiled the soil and groundwater data collected during recent and historic characterization activities at the Port Hope Conversion Facility site.
137. Lake Ontario Waterkeeper, in its intervention, expressed concerns regarding the impact of the facility on aquatic life and noted that the licence limits exceed the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life. Lake Ontario Waterkeeper proposed that the licence limits should be commensurate with both

provincial water quality objectives and Canadian Environmental Quality Guidelines. The Commission asked for more information concerning the protection of aquatic life around the facility. CNSC staff responded that the values of contaminants in Lake Ontario and the Port Hope harbour are well below the Canadian Environmental Quality Guidelines for the Protection of Aquatic Life. CNSC staff noted that the uranium concentration at the intake of the Port Hope water supply from Lake Ontario is less than one µg/L, which is well below the guideline of 15 µg/L. CNSC staff further noted that the guidelines are not meant to be effluent limits, and that the effluent limits are set to ensure that the water quality objectives are met in the receiving environment, in accordance with OMOE requirements. CNSC staff stated that there is no risk to the environment from the facility.

Conclusion on Environmental Protection

138. The Commission is of the opinion that, given the mitigation measures and safety programs that are in place or will be in place to control hazards, Cameco will provide adequate protection to the environment.
139. The Commission is satisfied that there is no significant impact on public health or the environment from the subsurface contamination, provided it continues to be effectively managed and monitored. The Commission directs CNSC staff to include information concerning the movement of the groundwater plume in its annual report to the Commission.
140. The Commission does not accept Cameco's request to retain the existing licence condition regarding the release of process water effluent and notes that Cameco can apply for a licence amendment in the future.

Emergency Management and Fire Protection

Emergency Management

141. Cameco described its measures for emergency management at the Port Hope Conversion Facility. Cameco stated that it has an Emergency Response Plan for the facility that assigns specific accountabilities and sets out processes and procedures to protect the health and safety of persons and the environment in the case of an emergency. Cameco explained that its Emergency Response Team consists of approximately 40 designated members.
142. Cameco noted that it has an emergency response and training assistance agreement with the Municipality of Port Hope, which provides added emergency response capability. Cameco explained that this agreement ensures that both organizations have the opportunity to train together to prepare for emergencies that could require a joint response. Cameco noted that it provides the Port Hope Fire and Emergency Services with the necessary equipment and training to effectively respond to emergencies at the Port Hope Conversion Facility.

143. CNSC staff stated that it confirmed through inspections of Cameco's emergency exercises that Cameco has adequately implemented its emergency plan. CNSC staff stated that it is satisfied that Cameco's emergency management program and its implementation meet requirements.
144. The Port Hope Community Health Concerns Committee, in its intervention, stated that Cameco and Port Hope are not listed as part of the Ontario Provincial Nuclear Emergency Response Plan (PNERP). The Commission asked for comments on this topic. CNSC staff reported that the Emergency Measures Ontario (EMO) division in Ottawa confirmed that the Cameco facilities in Port Hope are covered under the provincial emergency plan. The Emergency Measures Ontario representative explained that the OMOE has a very strong role throughout the PNERP, including environmental monitoring after a nuclear emergency and providing meteorological and hydrological support. The EMO representative added that, in Ontario, the municipality provides the initial response, and that the province provides additional resources if the municipality is unable to deal with the event. The EMO representative noted that there are resources available to respond to an emergency, if necessary.
145. One intervenor expressed concerns that the Port Hope telephone alerting system may not work in the event of an emergency, citing the experience of a recent water crisis in Port Hope where the system had to be used. The Commission asked for more information on this subject. The Mayor of Port Hope responded that the system uses telephone numbers based on geographic location, but noted that cell, Voice over Internet Protocol (VoIP) and cable phone systems were not reached. The Mayor of Port Hope stated that this issue has been addressed through the implementation of a registration system. The Mayor of Port Hope added that residents can register their numbers online or through the Port Hope fire department. The representative from EMO stated that Port Hope meets the requirements of the *Emergency Management and Civil Protection Act*¹¹.
146. The Commission asked for information about the collaboration between Cameco and the municipality. Representatives from United Steelworkers Local 8562, during their intervention, stated that they have conducted drills with the municipal fire department and police department. The Port Hope fire marshal noted the agreements between Cameco and the municipality. Cameco explained that it has extensive co-ordination with the municipality, including the community response plan and regular drills.
147. The Commission asked for more information concerning Cameco's on-site response to emergencies. A Cameco representative responded that Cameco's Emergency Response Team would address any incidents on site and noted that the municipal emergency services would only act in a supporting role if necessary. CNSC staff noted that it audits drills, and noted that it is satisfied that Cameco is qualified and prepared to respond to emergencies.

¹¹ R.S.O. 1990, CHAPTER E.9.

Fire Protection

148. Cameco described its fire protection measures at the facility. Cameco stated that the fire protection program meets the requirements of the *National Fire Code of Canada*¹², the *National Building Code of Canada*¹³, and *NFPA 801*. Cameco explained that a defence-in-depth approach was used to ensure that the fire protection measures would be adequate.
149. Cameco noted that the fire protection program is made up of the fire hazards analysis and fire protection supporting documents. Cameco explained that the fire hazards analysis identifies fire hazards and their potential impact related to life safety, radiation safety, environmental protection and asset protection. Cameco noted that, during the licence period, it completed a fire hazards analysis that meets the requirements of *NFPA 801*.
150. CNSC staff stated that it reviewed Cameco's fire protection program and implementation and found them to be acceptable. CNSC staff noted that Cameco addressed all of the recommendations arising from the fire hazards analysis through its corrective action plan and that Cameco committed to update the fire hazards analysis every five years.
151. The Commission asked for more information concerning the updates to the fire hazard analysis. A Cameco representative responded that the fire hazards analysis is reviewed every five years and updated every time a modification is made to any plant structures.

Conclusion on Emergency Management and Response

152. Based on the above information, the Commission concludes that the fire protection measures and emergency management program at the facility are adequate. The Commission is of the opinion that Cameco will provide adequate protection to the health and safety of persons, the environment and national security in cases of emergency and unplanned events.

Waste Management

153. Waste Management covers the licensee's waste management program in place and the planning for decommissioning of the facility.

¹² National Fire Code of Canada, 2005.

¹³ National Building Code of Canada, 2005.

Waste Management

154. Cameco described its Waste Management Program. Cameco explained that the objectives of this program are to minimize the generation of waste at the facility and dispose of wastes and by-products generated in accordance with regulatory requirements. Cameco noted that radiological criteria have been established for classifying wastes and that all non-contaminated solid waste is recycled or disposed of at a local municipal landfill site, in accordance with the *Nuclear Substances and Radiation Devices Regulations*¹⁴. Cameco further noted that contaminated combustible waste is packaged and shipped to its Blind River Uranium Refinery for incineration.
155. Cameco described the waste generated by the facility. Cameco stated that the UF₆ plant generates a fluoride slurry by-product that is subsequently dried, packed in drums and sent to a licensed facility to recover residual uranium content. Cameco further stated that the UO₂ plant generates an ammonium nitrate by-product solution that is treated to reduce uranium and radium to levels less than 10 mg/L and 370 mBq/L, respectively, and then released to a local agricultural supply company for use as a fertilizer. Cameco noted that the material is analyzed to ensure that the uranium and radium levels are below the CNSC requirements for release.
156. Cameco noted that radioactive, non-combustible wastes other than the fluoride by-product are presently being stored in on-site warehouses. Cameco further noted that contaminated solid wastes generated from the UF₆ plant rehabilitation activities during 2007 and 2008 were packed and stored safely at Site 2 of the facility. CNSC staff stated that the last 7,500 drums containing contaminated soil had been shipped to a licensed facility in the US for disposal as of the end of May 2011.
157. Cameco stated that historic low level radioactive wastes from the facility's previous use by Eldorado, prior to the formation of Cameco in 1988, would continue to be managed by Cameco on-site until the proposed Port Hope Area Initiative (PHAI) Long-Term Waste Management Facility is built to receive these wastes at the Welcome Waste Management Facility site. Cameco anticipated that some of the historic waste would be sent to the Long-Term Waste Management Facility during the next licensing period.
158. CNSC staff stated that it conducted an on-site review of Cameco's waste management practices at Cameco's Site 2 storage facility and found that there was no established drum storage, inspection and maintenance program being followed. CNSC staff noted that although waste inventories were being maintained, it is not possible to easily verify the inventory or visually inspect the integrity of storage containers due to the storage arrangement of drums inside the warehouse. CNSC staff stated that Cameco had committed to address these deficiencies. CNSC staff stated that it would continue to verify the implementation of this commitment during future compliance inspections. CNSC staff stated that it is satisfied that Cameco is adequately managing its waste.

¹⁴ SOR/2000-207.

159. The Commission asked for more information concerning the management of waste drums at Cameco's Dorset Street warehouse location. A Cameco representative responded that Cameco was assessing the condition of the waste storage drums in the two warehouses as part of its on-going waste management program, and that it would complete the process by December 2012. Cameco's representative stated that Cameco routinely inspects the warehouse buildings, and noted that there is no risk to the public or the environment from the drums that have not yet been inspected under this program.
160. The Commission enquired about Cameco's scrap metal recycling. A Cameco representative responded that Cameco cleans and recycles scrap metal material generated on-site and from Cameco's Fuel Manufacturing and Blind River facilities.
161. The Commission asked for more information about Cameco's management of hazardous chemical waste. Cameco's representative responded that a by-product of the UF₆ process is recycled through a facility in the United States. Cameco's representative noted that Cameco has used the process for many years and would continue to do so.
162. Several intervenors, including individuals, Physicians for Global Survival and the International Institute of Concern for Public Health, expressed concerns regarding the management of low-level radioactive waste. The Commission asked for more information in this regard. A Cameco representative responded that Cameco generates about 100 tonnes of solid waste annually and noted that it has safe, approved outlets for all of the types of waste. Cameco's representative explained that Cameco minimizes the volume of annual waste that is generated by recycling materials and by-products as much as possible. Cameco's representative further noted that there are no liquid wastes from the facility.
163. Families Against Radiation Exposure, in its intervention, expressed concerns regarding the fertilizer waste product. The Commission asked for more information on this subject. A representative from Cameco explained that ammonium nitrate is a by-product of Cameco's process, and that it is processed and sold as fertilizer material. The Cameco representative noted that the CNSC and Agriculture Canada have reviewed the product and found it to be safe. Cameco's representative further noted that the uranium content in the product is lower than other commercial fertilizers. CNSC staff confirmed that it, along with Agriculture Canada, Health Canada and the OMOE, had reviewed the product and found there were no risks. CNSC staff further stated that uranium in soil and fertilizers are not bio-available, and are not absorbed by plants or humans.

Decommissioning

164. The Commission requires that the licensee have operational plans for decommissioning and long-term management of waste produced during the life-span of the facility.

165. CNSC staff stated that licensees are required to maintain an acceptable preliminary decommissioning plan that sets out the manner by which the nuclear facility will be decommissioned in the future. The preliminary decommissioning plan must be kept current to reflect any changes in the site or facility, and meet the requirements of CSA standard *N294-09*¹⁵ and the guidance of CNSC Regulatory Guide *G-219*¹⁶. CNSC staff noted that the preliminary decommissioning plan for the Port Hope Conversion Facility must be reviewed and revised by Cameco every five years or when the Commission requires, in accordance with its operating licence. CNSC staff reported Cameco has maintained an acceptable preliminary decommissioning plan in accordance with its licence.
166. Cameco stated that it submitted an updated preliminary decommissioning plan in November 2010 that incorporated the site-wide environmental management plan. CNSC staff stated that that this preliminary decommissioning plan was acceptable.
167. The Municipality of Port Hope, in its intervention, raised questions regarding decommissioning. The Municipality of Port Hope noted that the preliminary decommissioning plan calls for waste to be managed at Cameco's facility in Blind River and questioned whether there are provisions in place in the event that the transport and storage of waste to Blind River is not possible. The Commission sought further information in this regard. A Cameco representative responded that Cameco has submitted its plan with the Municipality of Blind River and noted that it would continue to consult with the public on that plan. Cameco's representative further stated that Cameco would continue to revise the preliminary decommissioning plan in accordance with regulatory requirements. CNSC staff noted that, when the site is to be decommissioned, Cameco would have to submit a comprehensive decommissioning plan and be required to cover the full costs of decommissioning.
168. Some intervenors asked whether the preliminary decommissioning plan could be made available for public comment. The Commission sought further input in this regard. A Cameco representative responded that Cameco's preliminary decommissioning plan is confidential. CNSC staff concurred that, traditionally, these are protected documents. CNSC staff noted, however, that it could review the information in preliminary decommissioning plans and look into making some of it available to the public. The Commission agrees with this suggestion from CNSC staff and requests that CNSC staff look at the matter of the disclosure of preliminary decommissioning plans.

Conclusion on Waste Management and Decommissioning

169. Based on the above information and considerations, the Commission is satisfied that Cameco is safely managing waste at the Port Hope Conversion Facility. Furthermore, the Commission is satisfied that the preliminary decommissioning plan is acceptable for the purpose of the current application for licence renewal. The Commission

¹⁵ CSA standard N294: Decommissioning of Facilities Containing Nuclear Substances, 2009.

¹⁶ CNSC Regulatory Guide G-219, "Decommissioning Planning for Licensed Activities", 2000.

requests that CNSC staff look at the matter of the disclosure of preliminary decommissioning plans and report back to the Commission at a future proceeding of the Commission.

Security

- 170. With respect to site security issues, the Commission was provided with separate, protected CMDs, which were considered in a closed session.
- 171. The Commission concludes that Cameco has made adequate provision for ensuring the physical security of the facility, and is of the opinion that Cameco will continue to do so during the proposed licence period.

Safeguards and Non-Proliferation

- 172. The CNSC's regulatory mandate includes ensuring conformity with measures required to implement Canada's international obligations under the Treaty on the Non-Proliferation of Nuclear Weapons. Pursuant to the Treaty, Canada has entered into safeguards agreements with the IAEA. The objective of these agreements is for the IAEA to provide credible assurance on an annual basis to Canada and to the international community that all declared nuclear material is in peaceful, non-explosive uses and that there is no undeclared nuclear material or activities in this country.
- 173. CNSC staff stated that the Port Hope Conversion Facility site is subject to safeguards requirements as set out in the operating licence for this facility. CNSC staff noted that compliance includes the timely provision of reports on the movement and location of all nuclear materials, the provision of access and assistance to IAEA inspectors for verification activities, and the submission of annual operational information as well as accurate design information on plant processes and procedures.
- 174. CNSC staff reported that Cameco complied with safeguards requirements over the licence period, including providing the CNSC and IAEA with reports and information, and providing the IAEA the necessary access and assistance for it to perform its inspections.
- 175. CNSC staff stated that the proposed new licence includes requirements in line with CNSC regulatory document, *RD-336*¹⁷, which became effective in January 2011. CNSC staff noted that this regulatory document sets out the requirements for accurate and standardized accountancy of nuclear material inventories, and describes the reporting requirements of nuclear material.
- 176. The Commission enquired about the oversight of enriched uranium at the facility. A Cameco representative responded that Cameco works cooperatively with the IAEA, which conducted 11 inspections over the licence period and is aware of the material in inventory, including enriched uranium.

¹⁷ CNSC Regulatory Document RD-336, "Accounting and Reporting of Nuclear Material", 2011.

177. Some intervenors, including Families Against Radiation Exposure and individuals, expressed concerns regarding the United States' use of depleted uranium that may have originated from the Port Hope Conversion Facility. The Commission asked for more information on this subject. A Cameco representative responded that Cameco currently does not produce any products with depleted uranium. Cameco's representative noted that, in the past, Cameco produced counterbalances and shielding for peaceful purposes, and that it has not produced any depleted uranium for weapons purposes. CNSC staff noted that the 1955 Canada/US Nuclear Cooperation Agreement prohibits the use of Canadian nuclear materials for non-peaceful purposes.
178. Based on the above information, the Commission is satisfied that, in the areas of safeguards and non-proliferation at the Port Hope Conversion Facility, Cameco has made and will continue to make the necessary provision for maintaining national security and the measures necessary for implementing international agreements to which Canada has agreed.

Packaging and Transport

179. Packaging and transport covers the safe packaging and transport of nuclear substances and radiation devices to and from the Port Hope Conversion Facility. Cameco must adhere to the *Packaging and Transport of Nuclear Substances Regulations*¹⁸ and Transport Canada's *Transportation of Dangerous Goods Regulations*¹⁹ for all shipments leaving the site. The *Packaging and Transport of Nuclear Substances Regulations* apply to the packaging and transport of nuclear substances, including the design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage and unloading of packages.
180. Cameco provided information regarding its Packaging and Transportation Program. Cameco explained that UO₂ is packaged in drums and transported by road from the Port Hope Conversion Facility to Cameco's Fuel Manufacturing Facility in Cobourg, Ontario, as well as by road and water to Japan and Korea. Cameco noted that a small amount of material is transported by air for customer evaluation purposes. Cameco further noted that, in all cases, the drums meet *Packaging and Transport of Nuclear Substances Regulations* requirements. Cameco further stated that UF₆ is transported in certified cylinders by road or water to the United States, as well as overseas to the United Kingdom, Germany, Holland and Japan.
181. Cameco also described its transportation emergency response plan and noted that the plan was approved by Transport Canada.
182. CNSC staff stated that Cameco has complied with the *Packaging and Transport of Nuclear Substances Regulations* and the *Transportation of Dangerous Goods Regulations*. CNSC staff stated that it is satisfied that Cameco's Packaging and Transportation Program meets requirements.

¹⁸ SOR/2000-208.

¹⁹ SOR/2001-286.

183. In its intervention, the Port Hope Community Health Concerns Committee questioned why the European Union requires that UF₆ cylinders have special blanketing as a protective measure to prevent overheating, but that Canada does not. The Commission asked for more information on this topic. The Cameco representative stated that the UF₆ cylinders meet all relevant national and international regulatory requirements, and noted that they have been safely transported for several years. The Cameco representative added that the models used to measure whether the cylinder meets thermal requirements of being able to withstand an 800°C fire for 30 minutes are different in Europe, which is why the European Union requires a thermal blanket. CNSC staff concurred with Cameco, and noted that the IAEA accepts cylinders with or without thermal blankets.
184. The Port Hope Community Health Concerns Committee also expressed concerns regarding neutron radiation emitted by these cylinders. The Commission asked for comments on this topic. CNSC staff explained that the results from a study done by Cameco on the neutron dose rates during transport showed that the highest dose to a nuclear energy worker from neutron radiation would be 0.16 mSv, consistent with previous studies and less than ten percent of the annual average effective dose to the critical worker groups. CNSC staff noted that the potential dose to a member of the public would be less than 0.003 mSv per year, which is a small fraction of the regulatory dose of 1mSv for a member of the public.
185. The Commission further asked about the possibility of shielding for neutrons. A Cameco representative responded that neutrons are difficult to shield, but agreed with CNSC staff that doses from exposure to neutrons during transport are low and well-documented. Cameco's representative also noted that the results from their study on this topic have been accepted by CNSC staff. CNSC staff commented that the package used for transport undergoes leak testing and, once the package is filled, a dose measurement around the package is performed. CNSC staff stated that the precautions used to protect against other types of radiation also protect against neutrons. CNSC staff also noted that the packages containing nuclear material used by Cameco emit low energy neutrons, which do not travel far and, therefore, the general public's exposure to these neutrons is negligible.
186. The Port Hope Community Health Concerns Committee expressed concerns that radiation doses from neutrons would not be recorded on the workers dose records, and that it might prevent workers from receiving compensation in the case of radiation-related illnesses. This intervenor stated that, in the United States, doses to workers have been recalculated to take into account neutron radiation exposure that is not captured by standard dosimeters. The Commission asked for more information on the estimation of doses to workers in Canada. CNSC staff explained that they require special dosimeters for workers most likely to be exposed to neutrons, and that neutron radiation doses are estimated for other nuclear energy workers, including the workers who transport UF₆ cylinders. In the case of Cameco workers, CNSC staff stated that Cameco currently has enough information to provide a realistic estimate of neutron radiation doses. The intervenor requested that CNSC staff provide its analysis of the neutron risk from UF₆ cylinders in transport. CNSC staff stated that it would do so.

187. Based on the above information and considerations, the Commission is satisfied that Cameco is meeting regulatory requirements regarding packaging and transport. The Commission is also satisfied that workers are adequately protected from radiation exposure during transport and that their radiation doses are properly estimated and recorded. The Commission expects CNSC staff to provide the Port Hope Community Health Concerns Committee with the requested information concerning the neutron risk from UF₆ cylinders in transport.

Other Information

Application of the *Canadian Environmental Assessment Act*

188. Before making a licensing decision, the Commission must be satisfied that all applicable requirements of the *Canadian Environmental Assessment Act*²⁰ (CEAA) have been fulfilled.
189. CNSC staff indicated that the application to renew the licence for the facility under subsection 24(2) of the NSCA is not prescribed for the purposes of paragraph 5(1)(d) of the CEAA in the *Law List Regulations*²¹. Since there are no other CEAA triggers for this licence renewal, CNSC staff stated that an environmental assessment under CEAA is not required.
190. CNSC staff noted that Cameco is currently undertaking an environmental assessment for its proposed Vision 2010 project. CNSC staff noted that this project is not included in the proposed licence for the Port Hope Conversion Facility. CNSC staff stated that if the environmental assessment were approved, a licence amendment application would be considered by the Commission in a separate, future public hearing process.
191. Based upon the above assessment, the Commission is satisfied that an environmental assessment under the CEAA is not required for Cameco's application for licence renewal.

Cost Recovery

192. A Class I licensed facility is subject to the requirements of Part 2 of the CNSC *Cost Recovery Fees Regulations*²². Fees are normally charged on an annual basis and are paid by the licensee on a quarterly basis. CNSC staff noted that Cameco paid its cost recovery fees in full during the licence period.

²⁰ Statutes of Canada, S.C. 1992, c. 37

²¹ Statutory Orders and Regulations, S.O.R./94-636.

²² SOR/2003-212.

Financial Guarantee

193. In order to ensure that adequate resources are available for a safe and secure future decommissioning of the Port Hope Conversion Facility, the Commission requires that an adequate financial guarantee for realization of the planned activities be in place and maintained in a form acceptable to the Commission throughout the licence period. The financial guarantee must meet the criteria of CNSC Regulatory Guide *G-206*²³. The Commission approved Cameco's financial guarantee, which was in form of an irrevocable letter of credit from a Canadian bank in the amount of \$96 million, in September 2007.
194. CNSC staff stated that it had reviewed and accepted Cameco's revised preliminary decommissioning plan from November 2010. CNSC staff noted that the decommissioning cost estimate increased from \$96 million to \$101.7 million. Cameco stated that it would update the letter of credit for the full amount of the revised decommissioning costs from the 2010 preliminary decommissioning plan and provide a copy of the letter to the CNSC once the Commission accepts the revised decommissioning cost.
195. One individual and the Municipality of Port Hope expressed concerns regarding the cost estimate for the financial guarantee for the facility and recommended a higher amount. The Commission asked for more information on this topic. The Cameco representative responded that the cost estimate developed for the Port Hope Conversion Facility was accepted by CNSC staff. CNSC staff confirmed that they examine the submitted cost estimates for each facility and, when it is approved, the licensee needs to implement an acceptable form of financial guarantee. CNSC staff stated that the driving factor for the decommissioning cost of a facility such as the Port Hope Conversion Facility is not the cleanup of the site, but the taking down of the buildings on site. In Cameco's case, the financial guarantee is in the form of an irrevocable letter of credit payable to the CNSC. CNSC staff also noted that Cameco is required to revise its cost estimate every five years.
196. Based on this information, the Commission is satisfied that the preliminary decommissioning plan and related financial guarantee are acceptable for the purpose of the current application for licence renewal. The Commission accepts Cameco's proposed financial guarantee in the form of an irrevocable letter of credit from a Canadian bank in the amount of Canadian \$101.7 million.

²³ CNSC Regulatory Guide G-206, "Financial Guarantees for the Decommissioning of Licensed Activities", 2000.

Nuclear Liability Insurance

197. The *Nuclear Liability Act*²⁴ applies to any nuclear facility in Canada that has the potential to undergo a nuclear criticality event and has therefore been designated by the Commission for the purposes of the *Nuclear Liability Act*. This requires that the facility must have, as a minimum, a critical mass of enriched uranium. If a facility possesses a critical mass or more of enriched uranium then it must be designated, under the *Nuclear Liability Act*, as a nuclear installation. The facility then has to carry nuclear liability insurance.
198. CNSC staff explained that due to the amount of enriched uranium used and stored at the Port Hope Conversion Facility site, the facility has been designated as a nuclear installation. CNSC staff further stated that Cameco has the required insurance and meets the requirements of the *Nuclear Liability Act*.
199. One intervenor questioned the liability insurance for the facility. The Commission asked for more information in this regard. CNSC staff responded that Cameco has the required liability insurance for non-radiological events, and noted that the liability under the *Nuclear Liability Act* is for damages resulting from a criticality event.
200. The Commission is satisfied that Cameco has the required insurance and meets the requirements of the *Nuclear Liability Act*.

Vision 2010 and the Port Hope Area Initiative

201. Cameco stated that the Port Hope Area Initiative and Vision 2010 projects would occur during the licence period and noted that both projects were undergoing separate environmental assessments. Cameco further noted the importance of ensuring the safe implementation of the Vision 2010 project, with careful planning and oversight to ensure that all objectives are met, alongside the objectives of the Port Hope Area Initiative. Atomic Energy of Canada Limited provided information about the Port Hope Area Initiative in its intervention. CNSC staff noted that these projects were not associated with the proposed licence renewal and that they would be considered by the Commission in separate, future public hearing processes.
202. Several intervenors, including individuals, the Municipality of Port Hope, Physicians for Global Survival and the East Toronto Youth Nuclear Group raised issues regarding these projects, including waste storage and cost. The Commission notes that these issues should be addressed in the context of the processes established for those projects.

²⁴ R.S.C., 1985, c. N-28

Public Information Program and Aboriginal Consultation

Public Information Program

203. A public information program is a regulatory requirement for licence applicants and licensed operators of Class I nuclear facilities, such as nuclear generating stations. Public information programs are assessed against criteria set out in draft Regulatory Guide G-217²⁵.
204. Cameco described its public information program. Cameco explained that it has undertaken a wide range of initiatives to share information and interact with the community of Port Hope, including open forums and newsletters, as well as phone calls, e-mails and meetings with individuals and local organizations. Cameco noted that it is committed to providing the community with accurate and transparent reporting of environmental practices and performance, and that it has a dedicated Web site for the Port Hope Conversion Facility. Cameco further noted that it provides updates to Port Hope city council and regularly meets with the Mayor and Chief Administrative Officer of the Municipality of Port Hope. Cameco also provided information concerning a 2011 survey of Port Hope residents that found a majority of Port Hope residents are supportive of Cameco's operations in Port Hope.
205. CNSC staff stated that it reviewed Cameco's public information program and found it to be acceptable.
206. The Municipality of Port Hope, in its intervention, expressed support for Cameco and stated that Cameco is a good corporate citizen. The Municipality of Port Hope noted that Cameco had improved its community relations over the past licence period and expressed that Cameco's public information program has kept the public informed of its operations. The Town of Cobourg also expressed support for Cameco.
207. The Commission noted the results of the survey indicated that one third of residents of Port Hope may have some concerns regarding the facility. The Commission asked for more information on these concerns. A Cameco representative responded that the residents' comments centered on environmental concerns, such as potential leaks, spills, fires or radiation dangers; health and safety issues such as long-lasting health effects or water quality; the facility's location and that it detracts from the waterfront; and waste management concerns related to disposal and safeguards.
208. The Commission asked for more information regarding the range of Cameco's public information activities. Cameco's representative responded that Cameco's community forums are open to the public and are advertised in a Northumberland County newspaper that extends beyond Port Hope to Cobourg and the surrounding region. Cameco's representative noted that the primary interest in the facility is from local residents and the newsletter is sent to residents of Port Hope. The Cameco representative further noted that Cameco posts community forum presentations and information on its Web site.

²⁵ CNSC Draft Regulatory Guide G-217, "Licensee Public Information Programs", 2004.

209. The Port Hope Community Health Concerns Committee, in its intervention, complained about the lack of public information regarding approvals by CNSC staff. The Commission asked for comments on this topic. CNSC staff explained that the licence format has been changed to include a Licence Conditions Handbook, one of the purposes being to make the information more visible. CNSC staff stated that approvals that are deemed of interest to the public will be reported to the Commission in a public meeting as soon as practicable and will not wait for the annual report to be made public.
210. One intervenor presented information concerning a survey of Port Hope high school students. The intervenor suggested that the results of the survey demonstrated that while youth are exposed to information about the nuclear industry and Cameco's operations, they may not have a strong understanding of the subject. The intervenor noted that it is often difficult to engage youth and emphasized the important role of school and parents in providing information. The East Toronto Youth Nuclear Group, in their intervention, expressed an interest in Cameco's activities but noted that there are mixed messages regarding the safety of the nuclear industry.
211. The Commission asked for more information concerning Cameco's outreach to youth. A Cameco representative responded that Cameco has a variety of activities in its public information program, as well as teaching seminars, scholarships and involvement in the community. Cameco's representative noted that Cameco does not use social media and acknowledged the difficulty in engaging youth. The Commission encourages Cameco to improve this aspect of its public information program.
212. The Commission asked if Cameco allows tours of its facility. A Cameco representative responded that Cameco does allow tours upon request. Cameco's representative noted that Cameco does not have 'open house' tours because the tours need to be done in a controlled manner for safety and security reasons.
213. Several intervenors, including charitable organizations and community groups, highlighted that Cameco had provided them with financial support. Other intervenors asked if Cameco could provide a list of all of the organizations to which it had donated. The Commission asked if Cameco made this information available. Cameco committed to making such a list available, but noted that some information may be confidential.

Aboriginal Consultation

214. CNSC staff stated that, as an agent of the Crown and as Canada's nuclear regulator, the CNSC recognizes and understands the importance of consulting and building relationships with Canada's Aboriginal peoples. The CNSC ensures that all its licensing decisions under the NSCA and decisions pertaining to environmental assessments under the CEAA uphold the honour of the Crown and consider Aboriginal peoples' potential or established Aboriginal or treaty rights pursuant to section 35 of the *Constitution Act, 1982*.²⁶

²⁶ *The Constitution Act, 1982*, being Schedule B to the Canada Act 1982 (U.K.), 1982, c. 11.

215. CNSC staff stated that, upon receipt of the licence renewal application from Cameco, it conducted research to determine the Aboriginal groups that may have an interest in the licensing decision. CNSC staff further stated that it sent notification letters to the identified groups on July 8, 2011, with follow-up phone calls, with information on the following:
- details regarding the licence application;
 - invitation to participate in the CNSC public hearing process; and
 - information regarding the CNSC's Participant Funding Program.
216. CNSC staff stated that it also requested information from the Aboriginal groups on how the Commission's decision may have an adverse impact on their communities. CNSC staff noted that no new potential impacts on surrounding lands were expected to occur as a result of the licence renewal application.
217. Cameco also described its consultation with Aboriginal peoples. Cameco stated that it includes the chiefs of the five nearest First Nations bands on its mailing list to ensure that the First Nations are aware of all community forums and other community events. Cameco noted that it had also met with the Métis Nation of Ontario.
218. CNSC staff stated that Cameco's licensed activity is not expected to cause an adverse impact to any potential or established Aboriginal or treaty rights. CNSC staff noted that the Port Hope Conversion Facility is located in the geographic area covered by the *Williams Treaties* of 1923, which does not secure hunting, fishing and trapping rights.
219. Families Against Radiation Exposure, in its intervention, questioned the effectiveness of CNSC staff's Aboriginal consultation activities. The Commission asked for more information on this subject. CNSC staff responded that they take the duty to consult very seriously and follow a codified process. CNSC staff described its Aboriginal engagement activities, including letters of notification, the CMDs for the hearing, the notification for participant funding, follow-up phone calls, reminders of the hearing and participant funding deadlines. CNSC staff noted that none of the Aboriginal groups responded with any concerns. CNSC staff stated that, based on this information, there are no concerns about adverse impacts to any Aboriginal rights in the area from the facility. CNSC staff noted that the duty to consult does not extend to Aboriginal groups outside Canada. A Cameco representative noted that Cameco would continue to consult with Aboriginal groups, including the Métis Nation of Ontario.

Conclusion on Public Information Program and Aboriginal Consultation

220. Based on this information, the Commission is satisfied that Cameco's public information program meets regulatory requirements and is effective in keeping the public informed on the facility operations. The Commission is satisfied that Cameco has adequately consulted with the public, Aboriginal persons and other stakeholders. The Commission is also satisfied that this licence renewal hearing process accords with the Commission's duty to conduct itself in a way to uphold the honour of the Crown.

Licence Length and Conditions

221. Cameco has applied to the CNSC for a five-year renewal of its operating licence for the Port Hope Conversion Facility. CNSC staff recommended that the Commission accept and grant the proposed five-year term. CNSC staff stated that Cameco is qualified to operate for the proposed licence period, and that there is adequate management and oversight in place for all processes.
222. CNSC staff proposed a new licence format for the operating licence. CNSC staff explained that the new licence format incorporates the use of a Licence Conditions Handbook (LCH) and is meant to strengthen regulatory oversight, increase regulatory effectiveness and efficiency, and reduce administrative efforts.
223. CNSC staff explained that the new licence incorporates a risk-informed approach, eliminates cascading references to changing working-level licensee documentation and establishes compliance verification criteria to be used by the licensee for self-compliance verification and by CNSC staff for a regulatory focus on risk-significant items. CNSC staff further explained that the proposed licence conditions refer to well-defined policies or programs, specific requirements in accepted standards and regulatory documents, and tables of numerical limits which define the limits of authorization issued by the Commission. CNSC staff noted that the new licence format has been implemented for other licensees' fuel facility operating licences.
224. In addition to the licence, CNSC staff provided information regarding the Licence Conditions Handbook. CNSC staff explained that the Licence Conditions Handbook consolidates compliance verification criteria, provides interpretations and clarifies how the licensee must be in compliance with the licence. CNSC staff further explained that the Licence Conditions Handbook is specific to each individual facility.
225. Several intervenors, including individuals, Physicians for Global Survival, the International Institute of Concern for Public Health, the Port Hope Community Health Concerns Committee, Families Against Radiation Exposure, the Canadian Coalition for Nuclear Responsibility and the Ontario Clean Air Alliance, opposed the licence renewal. One individual requested a two-year licence period, on the basis that the world has changing views and opinions on the nuclear industry. The Port Hope Community Health Concerns Committee also suggested a two-year licence, with the condition that within this two-year licence period, Cameco present a plan to fully decommission the facility.
226. Some intervenors, including individuals, Lake Ontario Waterkeeper, and the East Toronto Youth Nuclear Group, expressed some concerns regarding the operation of the facility and noted areas where Cameco could improve its performance.

227. Other intervenors, including individuals, Cameco employees, charitable organizations and community groups, the Municipality of Port Hope, the Town of Cobourg, United Steelworkers Local 13173, United Steelworkers Local 8562, E.S. Fox Ltd., Atomic Energy of Canada Limited, Northumberland Manufacturers' Association, Canadian Nuclear Workers Council, Northumberland Labour Council, McMaster University, United Brotherhood of Carpenters (Carpenters Union Local 397), Commissioners of the Port Hope Harbour and the Canadian Nuclear Association, expressed support for the proposed licence renewal. Intervenors were of the view that Cameco has safely operated the Port Hope Conversion Facility and would continue to do so over the life of the facility. Intervenors were also of the view that Cameco was an important part of community and economy in Port Hope.
228. The Commission asked CNSC staff for any advantages to the public for Cameco to have a longer licence period. CNSC staff responded that one advantage of a longer licence is that trends are more visible with multiple years of data, and that a more frequent and comprehensive verification of the licensee's compliance is possible. The Commission commented that the public does not perceive any real advantages for a longer licence period and asked CNSC staff how the planned annual report would grant the public opportunity for comments. CNSC staff confirmed its intent to provide relevant compliance data in the industry report and stated that it expects public interventions to be allowed.
229. Based on the provided information and above considerations, the Commission is satisfied that a five-year licence is appropriate. The Commission accepts the licence format, licence conditions and LCH as recommended by CNSC staff. The Commission also accepts CNSC staff's recommendation regarding the delegation of authority in the LCH. The Commission notes that CNSC staff can bring any matter to the Commission as applicable. The Commission directs CNSC staff to inform the Commission on an annual basis of any changes made to the LCH.

Conclusion

230. The Commission has considered the information and submissions of CNSC staff, Cameco and all participants as set out in the material available for reference on the record, as well as the oral and written submissions provided or made by the participants at the hearing.
231. The Commission concludes that an environmental assessment of the proposed continued operation of the facility, pursuant to the *Canadian Environmental Assessment Act* is not required.
232. The Commission is satisfied that the Cameco meets the requirements of subsection 24(4) of the *Nuclear Safety and Control Act*. That is, the Commission is of the opinion that Cameco is qualified to carry on the activity that the proposed licence will authorize and that Cameco will make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

233. Therefore, the Commission, pursuant to section 24 of the *Nuclear Safety and Control Act*, renews Cameco Corporation's Nuclear Fuel Facility Operating Licence for its Port Hope Conversion Facility located in Port Hope, Ontario. The renewed licence, FFOL-3631.0/2017, is valid from March 1, 2012 to February 28, 2017.
234. The Commission includes in the licence the conditions as recommended by CNSC staff and set out in the draft licence attached to CMD 11-H16. The Commission denies Cameco's request to retain existing licence condition 5.5 regarding the release of process waste water effluent. The Commission is of the view that Cameco has taken a positive step in removing these releases and encourages Cameco to avoid reverting to past practices. The Commission acknowledges the reasons for Cameco's request and notes that Cameco can apply for a licence amendment in the future if Cameco considers it absolutely necessary to resume this practice. The Commission expects that Cameco would submit a detailed proposal at that time.
235. The Commission delegates approval authority as described in the draft Licence Conditions Handbook that was submitted as attachment to CMD 11-H16.
236. With this decision, the Commission directs CNSC staff to prepare an annual industry report that includes the results of compliance activities carried out during the licence period pertaining to this facility. The report should also include detailed information on emissions and the movement of the groundwater plume on the Port Hope Conversion Facility site. CNSC staff shall present their report at a public proceeding of the Commission, in the fall of each year.



Michael Binder
President,
Canadian Nuclear Safety Commission

APR 10 2012

Date

Appendix A – Intervenors

Intervenors	Document Number
Lori Carter	CMD 11-H16.2
Debbie Hoselton	CMD 11-H16.3
Lake Ontario Waterkeeper	CMD 11-H16.4
Myron Szalawiga	CMD 11-H16.5
Gerald Crawford	CMD 11-H16.6
Junior Achievement Peterborough. Lakeland, Muskoka	CMD 11-H16.7
Jean-Pierre Pascoli	CMD 11-H16.8
Bill Edwards	CMD 11-H16.9
Cobourg Highland Games Society	CMD 11-H16.10
Marilyn Routly	CMD 11-H16.11
Jackie Brimblecombe	CMD 11-H16.12
Rachelle Torrieri	CMD 11-H16.13
United Steelworkers, Local 13173, represented by C. Leavitt and R. Davis	CMD 11-H16.14 CMD 11-H16.14A CMD 11-H16.14B
Ron Smith	CMD 11-H16.15
Mayor of the Town of Cobourg, represented by G. Brocanier	CMD 11-H16.16
Port Hope and District Chamber of Commerce	CMD 11-H16.17
Friends of Music	CMD 11-H16.18
Diane Flesch	CMD 11-H16.19
Gerhard Heinrich	CMD 11-H16.20
Bruce Cooper	CMD 11-H16.21
Municipality of Port Hope, represented by L. Thompson and C. Cannon	CMD 11-H16.22 CMD 11-H16.22A
E.S. Fox Ltd.	CMD 11-H16.23
Northumberland Players	CMD 11-H16.24
T.J. (Tim) Haynes Professional Corporation	CMD 11-H16.25
Suzanne Frankcom-Wright	CMD 11-H16.26
Cobourg Dragon Boat and Canoe Club	CMD 11-H16.27
Ed Lam	CMD 11-H16.28
All-Canadian Jazz Festival Port Hope	CMD 11-H16.29
Ron Davis	CMD 11-H16.30
Northumberland Sunrise Rotary	CMD 11-H16.31
Community Care Northumberland	CMD 11-H16.32
HMC Consulting	CMD 11-H16.33
Atomic Energy of Canada Limited, represented by C. Fahey and G. Case	CMD 11-H16.34 CMD 11-H16.34A
Eric Campbell	CMD 11-H16.35 CMD 11-H16.35A
Northumberland United Way	CMD 11-H16.36
John Morand	CMD 11-H16.37 CMD 11-H16.37A

Hannibal Farola	CMD 11-H16.38
Physicians for Global Survival, represented by L. Harvey	CMD 11-H16.39
Dan Rudka	CMD 11-H16.40
Christa Ingalls	CMD 11-H16.41
David Henderson	CMD 11-H16.42
Port Hope Figure Skating Club	CMD 11-H16.43
Michael Murchie	CMD 11-H16.44
Victor Allan Glover	CMD 11-H16.45
United Steelworkers Local 8562, represented by A. Lent	CMD 11-H16.46 CMD 11-H16.46A
Northumberland Manufacturers' Association	CMD 11-H16.47
Cobourg Waterfront Festival Central Board Directors, represented by P. Kulik	CMD 11-H16.48
Stephen F. Alexander	CMD 11-H16.49
Lou Rinaldi, former M.P.P., Northumberland-Quinte West	CMD 11-H16.50
Tim Seitz	CMD 11-H16.51
Canadian Nuclear Workers Council, represented by D. Shier, T. Fraser and G. McBride	CMD 11-H16.52
International Institute of Concern for Public Health (IICPH), represented by A. Tilman	CMD 11-H16.53 CMD 11-H16.53A
Lorne VanderDussen	CMD 11-H16.54
Northumberland Labour Council, represented by V. Salaverry	CMD 11-H16.55
Robert Jean	CMD 11-H16.56
Tom Fraser	CMD 11-H16.57
Northumberland Services for Women	CMD 11-H16.58
Pat McNamara	CMD 11-H16.59
McMaster University, represented by D. Boreham	CMD 11-H16.60 CMD 11-H16.60A
Gary McCracken	CMD 11-H16.61
Shane Watson	CMD 11-H16.62
United Brotherhood of Carpenters (Carpenters Union Local 397)	CMD 11-H16.63
Commissioners of the Port Hope Harbor	CMD 11-H16.64
Larry Johnston	CMD 11-H16.65
FishAbility Sports Club	CMD 11-H16.66
Joanne Rockey-Smith	CMD 11-H16.67
Chad Kavanaugh	CMD 11-H16.68
Nicole Emanuel	CMD 11-H16.69
Tom Lawson	CMD 11-H16.70
Marc Boucher	CMD 11-H16.71
Lori Gray	CMD 11-H16.72
The Friends of Wesleyville Village	CMD 11-H16.73
Thom Mambe	CMD 11-H16.74
Jack De Klerk	CMD 11-H16.75
Habitat for Humanity Northumberland	CMD 11-H16.76

Canadian Nuclear Association, represented by D. Carpenter and H. Kleb	CMD 11-H16.77
Graeme Lawson	CMD 11-H16.78
Sanford and Helen Anne Haskill	CMD 11-H16.79
Darryl Godfrey	CMD 11-H16.80
Patricia Lawson	CMD 11-H16.81
Derrick Kelly	CMD 11-H16.82
Ian McDonald	CMD 11-H16.83
Port Hope Community Health Concerns Committee, represented by F. More	CMD 11-H16.84
Families Against Radiation Exposure (FARE), represented by D. Kelly and K. Kamps	CMD 11-H16.85
John Wilcox	CMD 11-H16.86
Canadian Coalition for Nuclear Responsibility, represented by G. Edwards	CMD 11-H16.87
Steve Douglas	CMD 11-H16.88
Cobourg Community Centre	CMD 11-H16.89
Ron Moreau	CMD 11-H16.90
Capital Theatre Heritage Foundation	CMD 11-H16.91
Tyler Rouse	CMD 11-H16.92
Angelo Torrieri	CMD 11-H16.93
Jason Whitelaw	CMD 11-H16.94
Helen Caldicott	CMD 11-H16.95
Janet McNeill	CMD 11-H16.96 CMD 11-H16.96A
Ontario Clean Air Alliance	CMD 11-H16.97 CMD 11-H16.97A
East Toronto Youth Nuclear Group, represented by T. Waugh	CMD 11-H16.98