

1 **Atomic Energy of Canada Limited:**
2 **Environmental Assessment Screening**
3 **For AECL's proposal to continue**
4 **operation of the Nuclear Research**
5 **Universal (NRU) Reactor beyond its**
6 **Currently scheduled shutdown on**
7 **December 31, 2005**

8
9 **05-H12.1**

10 **Oral presentation by**
11 **Atomic Energy of Canada Limited**

12 **MR. VAN ADEL:** Thank you very much. Good
13 morning, Madam Chair, Members of the Commission, and thank
14 you for the opportunity to talk to you today about the
15 environmental assessment for the operation of the NRU
16 beyond 2005.

17 For the record, I am Bob Van Adel,
18 President and CEO of AECL and I am accompanied here today
19 by Dr. David Torgerson on my left, Senior Vice-President,
20 Technology and Chief Technology Officer for AECL, and on
21 my right, Dr. Paul Fehrenbach, Vice-President of the
22 Nuclear Laboratories Business Unit, as well as key members
23 of the AECL team have been working on this very important
24 project.

25 I would like to make a few opening remarks

1 and then we will ask Dr. Fehrenbach to direct specific
2 questions on behalf of our team.

3 In 1996, AECL informed the Atomic Energy
4 Control Board that the NRU Reactor would not continue
5 operating beyond 2005. That decision was based on the
6 assumption that a replacement facility would be operating
7 by now. That has obviously not happened.

8 So the NRU continues to be an important
9 source of medical isotope production and is Canada's
10 premier facility for nuclear power research and materials
11 research. We believe that it is essential to continue
12 operating NRU to meet these needs until a long-term
13 solution is developed.

14 As the world's largest source of medical
15 radionuclides, NRU provides more than 34,000 treatments
16 every day. NRU also produces the majority of the world's
17 medical isotopes, including Moly-99 and several longer
18 lived isotopes such as Cobalt-60, which is used for cancer
19 therapy. Production of these longer lived isotopes will
20 continue in the NRU after the dedicated isotope facility
21 is fully operational.

22 NRU is the only facility capable of meeting
23 the R&D needs of Canada's worldwide CANDU Power Program,
24 access to world-class domestic research. The reactor
25 remains essential for the continued sustainability and

1 growth of AECL as both a Canadian centre of excellence in
2 nuclear R&D and as a commercial vendor of CANDU reactors
3 and reactor services.

4 NRU is also of significant importance to
5 the Canadian nuclear industry and to the Canadian
6 scientific research community. It is the only source of
7 neutrons for the National Research Council's Canadian
8 Neutron Beam Centre which hosts independent and
9 collaborative research projects with professors and
10 students from 23 Canadian universities and by scientists
11 from 115 institutions in 19 countries.

12 NRU is a multipurpose research reactor that
13 continues to deliver enormous benefits to Canadians and
14 people around the world every day.

15 In contrast, the companies with larger
16 populations where single-purpose reactors are common, NRU
17 is a classic Canadian solution that provides a wide range
18 of capabilities to Canada's diverse science and technology
19 communities. It is a tribute to the scientists and
20 engineers at that time that the NRU remains a world-class
21 facility nearly 50 years later.

22 AECL takes pride in operating and
23 maintaining NRU in a safe and an environmentally sound
24 manner.

25 Since 1996, AECL has invested more than \$30

1 million in physical improvements to the NRU to ensure and
2 improve its safety and to date we have installed seven
3 safety upgrades and five are already in service.

4 AECL is investing an additional \$10 million
5 in the NRU Licence Ability Extension Program and we have
6 completed a comprehensive update of the NRU Safety Report
7 and thoroughly assessed the conditions of the facility to
8 make sure that it is fit to continue to operate, and we
9 have a robust Aging Management Program in which we
10 continuously replace and upgrade equipment as required.

11 So our proposal is to continue operating
12 NRU in its current configuration until about 2012 and we
13 are in discussions with the Ministry of Natural Resources
14 and the National Research Council about the future of the
15 NRU beyond 2012. Several options are being discussed,
16 including a major refurbishment of the NRU, replacing the
17 NRU with a new multipurpose facility or building several
18 new reactors, each to meet a specific NRU function.

19 Those discussions will carry on for some
20 time, but we are here today to discuss the Environmental
21 Assessment for Continued Operation of the NRU to about
22 2012.

23 While CNSC staff has issued a screening
24 report for the NRU Environmental Assessment, AECL has been
25 continuously monitoring and proactively taking steps to

1 improve the environmental performance of the NRU and our
2 other facilities at Chalk River.

3 I am pleased to report that in May of last
4 year we were successful in obtaining ISO 14001
5 Environmental Management System Certification for the
6 Chalk River Laboratories. This standard calls for a
7 continuous effort to improve environmental performance and
8 we are committed to that effort.

9 We completed an ecological effects review
10 for the Chalk River site in 2004, which the CNSC staff has
11 accepted, and shared the results with the First Nations
12 citizens groups and other key stakeholders through a
13 series of meetings in January and we have also issued our
14 environmental plan for 2005-06 which identifies the
15 projects we are upgrading to the ISO 14001 standard.

16 We agree with the conclusion of CNSC staff
17 screening report that continued operation of the NRU will
18 pose minimal risk to the environment.

19 AECL has worked hard to make information on
20 the environmental assessment and AECL's request to
21 continue operation of the NRU accessible to our
22 stakeholders. We have provided many opportunities for
23 those stakeholders to make suggestions and voice their
24 concerns including letters and offerings of briefings to
25 federal, provincial, municipal elected officials in

1 Renfrew and Pontiac Counties, to the Chief and Council of
2 the Algonquin First Nations and to identified citizens
3 groups and through four public information sessions held
4 in our key communities near the facility. All of this
5 information has been posted on our website.

6 The results of the consultation activities
7 support the CNSC staff's recommendation that the EA be
8 approved. The Commission has received several letters of
9 support from continued operation of the NRU and we are
10 very appreciative of the support and interest from our
11 community stakeholders.

12 In conclusion, the continued operation of
13 NRU is vital to Canadians and to thousands of people
14 around the world. We have invested in safety upgrades to
15 the facility and are implementing programs to ensure that
16 NRU continues to operate safely. We intend to demonstrate
17 to the satisfaction of CNSC staff and the Commission that
18 AECL is fully capable of operating NRU safely beyond 2005.

19 Should the Commission accept the EA, I can
20 confirm that AECL has the resources and the people to
21 operate the facility in a safe and environmentally sound
22 manner.

23 Thank you. This concludes my remarks.

24 **THE CHAIRPERSON:** Thank you very much, Mr.
25 Van Adel.

1 I would like now to turn to the CNSC staff,
2 as noted in CMDs 05-H12, 05-H12.A, and I would like to
3 turn to Mr. Barclay Howden, the Director General
4 responsible.

5 Mr. Howden.

6 **05-H12 / 05-H12.A**

7 **Oral presentation by**

8 **CNSC staff**

9 **MR. HOWDEN:** Thank you. Good morning,
10 Madam Chair, Members of the Commission. For the record,
11 my name is Barclay Howden. With me today are Mr. Greg
12 Lamarre, Director of the Research Facilities Division, Mr.
13 Claude David, Acting Director and Environmental Assessment
14 Specialist with the Processing Facilities and Technical
15 Support Division, Dr. Patsy Thompson, Director of the
16 Environmental Protection and Audit Division and Mr.
17 Constantine Nache, Project Officer with the Research
18 Facilities Division.

19 CMD 05-H12 concerns the Environmental
20 Assessment of the continued uninterrupted operation of the
21 National Research Universal, which is NRU, Reactor.

22 Atomic Energy of Canada, AECL, has applied
23 for authorization to continue to operate the NRU Reactor
24 at Chalk River beyond December 31st, 2005.

25 The authorization of this activity requires

1 an amendment to AECL's nuclear research and test
2 establishment operating licence pursuant to section 24 of
3 the *Nuclear Safety and Control Act*, the NSCA.

4 In accordance with the requirements of the
5 *Canadian Environmental Assessment Act*, a screening
6 environmental assessment was conducted resulting in the
7 screening report, which is the subject of today's
8 presentation.

9 The presentation will ask for your decision
10 on the recommendations presented in the screening report.

11 I will now ask Mr. David to present the
12 CMD.

13 Thank you.

14 **MR. DAVID:** Thank you. For the record, my
15 name is Claude David. Good morning Madam President and
16 Members of the Commission.

17 Today I would like to present to you the
18 screening report for the environmental assessment of
19 AECL's proposal to continue to operate the NRU Reactor
20 until 2012.

21 In presenting the screening report I will
22 briefly outline AECL's proposal. I will also review the
23 environmental assessment process applied to this project,
24 present the project environment interactions identified in
25 the environmental assessment and comment on the need for

1 implementation of mitigation measures and follow-up
2 considerations and, finally, make recommendations to you
3 with regards to the screening report.

4 The proposed continued and uninterrupted
5 operation of the NRU is an undertaking in relation to
6 physical work and is defined as a project under paragraph
7 2(1)(a) of the *Canadian Environmental Assessment Act*. No
8 changes to the day-to-day operations or to the design of
9 the reactor are being proposed for this project.

10 The purpose of the proposed life extension
11 of the NRU Reactor until 2012 is to allow AECL to continue
12 its activities in support of nuclear power development,
13 isotope production, fundamental research in neutron
14 physics and other commercial applications.

15 This slide illustrates some of the steps
16 undertaken by CNSC staff to fulfil the requirements of the
17 *Canadian Environmental Assessment Act*, all of which are
18 described in more detail in the CMDs.

19 First I will describe the schedule for this
20 EA. On this topic, I would note that the EA process
21 lasted approximately seven months from the date of
22 determination that an EA was required to today's hearing.
23 I will also expand on some of the remaining steps listed
24 on this slide in this presentation.

25 This slide illustrates timelines for the EA

1 process applied to the NRU project against timelines
2 applied for typical environmental assessment screenings
3 conducted by the CNSC.

4 There are two changes to the EA process
5 that is typically applied by CNSC staff for the completion
6 of this assessment. The first change is related to the
7 preparation of technical studies and of the EA study
8 report. For the assessment of the NRU the preparation of
9 studies, including the study report, were not delegated to
10 AECL pursuant to subsection 17(1) of the CEAA, as is
11 normally the case for an EA screening completed by the
12 CNSC.

13 In the course of regulatory functions CNSC
14 required the AECL submit a number of reports, including a
15 site-wide environmental effects review and annual
16 performance and monitoring reports. These provided
17 sufficient information for staff to complete an EA
18 screening report.

19 The second change to the process is related
20 to the timing of public consultation on the screening
21 report. Normally, public consultation is conducted prior
22 to submission of the screening report to the Commission
23 Secretariat. For this assessment, public consultation was
24 conducted after submission of the screening report to the
25 Secretariat. Stakeholders, including federal expert

1 departments, were provided with a review period of about
2 four weeks. Dispositioning of the comments received on
3 the screening report are attached to supplementary CMD
4 H12.A and the EA screening report has been revised
5 accordingly as required.

6 The EA Guidelines approved by a designated
7 officer on March 30th, 2005 identified the scope of the
8 project considered in the assessment. The principal
9 project subject to this assessment is the NRU Reactor.
10 Systems and facilities considered ancillary include the
11 rod bays, experimental facilities, the emergency water
12 supply system, the reactor ventilation system and the main
13 exhaust stack.

14 Activities associated with day-to-day
15 operation of the NRU Reactor, such as reactor fuelling and
16 de-fuelling and management of waste produced as a result
17 of extending the operating life of the NRU Reactor are
18 also part of the scope of the project.

19 The scope of assessment includes all
20 factors required for screening EAs under the *Canadian*
21 *Environmental Assessment Act* and some of the discretionary
22 factors such as purpose of the project, need for and
23 requirements of a follow-up program and the likely effects
24 of the project on the capacity of renewable resources and
25 non-renewable resources to meet the needs of the present

1 and those of the future.

2 Federal departments and interested parties
3 provided input into the development of the EA Guidelines.

4 As previously mentioned, CNSC staff
5 prepared the EA screening report. This report was
6 attached to CMD 05-H12 and filed with the Commission on
7 April 29th, 2005. The CMD contained a CNSC staff
8 preliminary recommendation that the Commission accept the
9 conclusions of the screening report that the project is
10 not likely to cause significant adverse affects, subject
11 to consideration of any comments received on the EA
12 screening report.

13 CNSC staff committed to prepare a
14 supplementary CMD. Dispositioning comments received on
15 the report and confirming or modifying CNSC staff's
16 preliminary recommendation accordingly to the Commission.
17 Federal government departments and the Ontario Ministry of
18 the Environment and other interested parties were invited
19 to comment on the screening report.

20 The structure of the screening report is
21 intended to serve as a framework for explaining how the
22 assessment factors are systematically considered. The
23 introductory chapters, Chapters 1 to 6, describe the
24 screening process, including the application of the
25 *Canadian Environmental Assessment Act* and the

1 determination of scope and scope of project and scope of
2 assessment.

3 The project description section of the
4 report, Chapter 7, identifies the specific works and
5 activities of the project that have the potential to
6 interact with the surrounding environment during normal
7 operations and during malfunctions and accidents. For the
8 NRU environmental assessment the project description also
9 identifies mitigation measures that are already in place
10 to reduce or eliminate potential environmental effects.

11 Information about the existing environment,
12 Chapter 8, provides a baseline against which potential
13 environmental effects of project works and activities can
14 be assessed. The assessment of effects includes the
15 identification of potential interactions between the
16 project and the existing environment, the description of
17 the resulting changes likely to occur as a result of the
18 interactions, if any, the technically and economically
19 feasible mitigation measures that might be applied to each
20 likely effect, and the determination of the significance
21 of residual effects remaining after the application of
22 mitigation measures.

23 The screening report also provides a
24 consideration of the effects of this project, together
25 with those of other projects and activities that have been

1 or will be carried out and for which the effects are
2 expected to overlap in geographic area and time. This is
3 referred to as the assessment of cumulative effects. It
4 also describes the consultation activities undertaken by
5 the proponent and by CNSC staff. The report includes a
6 preliminary design and implementation plan for follow-up
7 and describes the approach for further developing the
8 follow-up program should the project be approved. And
9 finally, the screening report presents the conclusion
10 reached by CNSC staff and the resulting recommendations.

11 The NRU Reactor is located on federal lands
12 within the developed area of the Chalk River Laboratories
13 or the CRL site. The CRL site is located in Renfrew
14 County, Ontario on the shore of the Ottawa River, 200
15 kilometres north-west of Ottawa. Directly across the
16 Ottawa River are the Laurentian Hills in the province of
17 Quebec. Abutting the CRL property to the southeast is the
18 Canadian Forces Base, Petawawa. The village of Chalk
19 River lies to the southwest of the site and the town of
20 Deep River to the northwest.

21 Baseline conditions are established
22 according to characteristics of the biophysical
23 environment at the site and surrounding areas and the
24 area's socioeconomic setting. Biophysical characteristics
25 are described in the screening report in terms of

1 geological features, water quality, hydrology, aquatic
2 environment and terrestrial environment. Socioeconomic
3 characteristics are described in terms of the area's
4 population and economic base, land use, community
5 infrastructure and cultural and aboriginal interests.

6 This information provides baseline
7 conditions that form the foundation for the environmental
8 assessment.

9 At the initial screening all project
10 activities were examined to identify those that could
11 possibly interact with the environment. In all, 86
12 potential interactions were identified: 84 biophysical
13 interactions and two (2) positive socioeconomic
14 interactions. This information is presented in Chapter 9
15 of the EA Screening Report.

16 Each of the 84 interactions was then
17 assessed to determine its potential for a significant
18 measurable effect on the environment. Among the criteria
19 used for this assessment were regulatory standards and
20 guidelines, AECL compliance and monitoring reports
21 submitted to the CNSC, including a site-wide comprehensive
22 ecological risk assessment, and the expertise of CSNC's
23 specialists.

24 None of the project environment
25 interactions were determined to result in significant

1 measurable effects on the environment under normal
2 operating conditions. As a result, no interactions were
3 advanced to a detailed assessment. Therefore, no
4 additional mitigation measures beyond those that have
5 already been implemented are required as a result of this
6 environmental assessment screening. CNSC staff also
7 concluded that no measurable cumulative effects of
8 significance are expected.

9 The EA Screening Report's screening also
10 examined the effects of the environment on the project and
11 the effects of accidents and malfunctions, including the
12 effects of nuclear accidents and conventional accidents.
13 CNSC staff concluded that no significant measurable
14 effects are expected from such events.

15 To conclude, there are no proposed changes
16 to the design or day-to-day operation of the NRU Reactor;
17 only an extension of the operating period. The reactor
18 will continue to be operated in a similar manner. The
19 conclusion that the continued operation of the NRU until
20 2012 will not cause significant adverse effects on the
21 environment is supported for the most part by observed
22 data. Few assumptions had to be made in the completion of
23 this environmental assessment. This is a mature facility
24 where there is considerable operating experience and an
25 abundance of observed data that was used for the

1 completion of this environmental assessment.

2 Public consultation activities were
3 implemented to ensure that the public is provided with the
4 information required to understand the environmental
5 assessment of the project and to provide comment on the
6 findings presented in the screening report. The public
7 consultation activities were shared by CNSC staff and
8 AECL.

9 From February 7th, 2005 to February 23rd,
10 2005, CNSC staff sought comments from government
11 departments and the public on the EA Guidelines. Comments
12 were received from several federal departments, the Sierra
13 Club and the concerned citizens of Renfrew County. The
14 final EA Guidelines were distributed to federal
15 departments and other stakeholders, including the
16 Algonquins of Pikwàkanagàn -- excuse my pronunciation --
17 on April 11th, 2005. These comments were dispositioned in
18 CMD 05-H12 submitted to the Commission on April 29th,
19 2005.

20 The public was invited to comment on the
21 screening report through a Notice of Hearing which was
22 issued on April 7th, 2005. CNSC staff contacted by
23 telephone certain interested parties prior to April 29th
24 to ensure their participation in the process. CMD 05-H12,
25 along with a copy of a recent Ecological Risk Assessment

1 Report carried out for the Chalk River Laboratories' site,
2 was also provided directly to them.

3 In addition, comments were invited by way
4 of public notice advertisements which were placed in the
5 Renfrew Weekend News, the Ottawa Citizen, the Pembroke
6 Daily Observer, the Journal de Pontiac, the Pontiac
7 Journal, le journal Le Droit and the Windspeaker. CNSC
8 staff attended three of the four public information
9 sessions hosted by AECL in Deep River, Pembroke and in
10 Chapeau in the province of Quebec. These information
11 sessions were held in the latter part of May 2005.

12 Comments received on the screening report
13 are dispositioned in Appendix 1 of the supplementary CMD,
14 while copies of letters received from elected officials
15 from the Chalk River area are presented in Appendix 2 of
16 the supplementary CMD. The EA Screening Report has been
17 revised as a result of comments received. The revised
18 version of that report is attached as Appendix 3 of the
19 supplementary CMD.

20 As the responsible authority for the
21 project, the CNSC has an obligation to ensure that the
22 follow-up program is designed and implemented. The
23 objectives of a follow-up program are to verify if the
24 environmental effects of the project are as predicted and
25 to confirm that mitigation measures already implemented

1 continue to be effective in reducing, controlling or
2 eliminating potentially adverse environmental effects.

3 The follow-up program for the NRU life
4 extension project is associated with current operations of
5 the NRU Reactor and includes monitoring of chlorine
6 concentration in the NRU Reactor coolant, verifying the
7 screen size on the Chalk River Laboratories' water intake
8 pipe for conformance with *Fisheries Act* guidelines,
9 investigating the source of leaks that could potentially
10 be linked to NRU Reactor operations and the phasing out of
11 ozone depleted substances, the halon gas which is used as
12 a fire suppressant for the NRU.

13 The mechanism for ensuring that the
14 development and implementation of the follow-up program
15 will be the CNSC licensing and compliance program.

16 CNSC staff and other federal departments
17 have reviewed the environmental assessment documentation.
18 On the basis of this review, CNSC staff concludes that the
19 proposed continued operation of the NRU Reactor until
20 2012, taking into account mitigation measures already
21 implemented, is not likely to cause significant adverse
22 environmental effects.

23 CNSC staff recommends that the Commission
24 accept this conclusion and proceed with a course of action
25 consistent with Paragraph 21(a) of the *Canadian*

1 *Environmental Assessment Act*. That course of action would
2 be consideration by the Commission under the *Nuclear*
3 *Safety and Control Act* of the application by Atomic Energy
4 of Canada Limited to continue to operate the NRU Reactor.

5 This concludes my presentation. Thank you.

6 **MR. HOWDEN:** Madam Chair, Members of the
7 Commission, that concludes CNSC's staff presentation. We
8 are available to respond to questions.

9 **THE CHAIRPERSON:** Thank you, Mr. Howden.

10 We will now open the floor for questions to
11 both AECL and to CNSC staff and we will start with Dr.
12 McDill.

13 **MEMBER McDILL:** Thank you. In the first
14 round, my questions are quite specific.

15 With respect to the halon testing, or the
16 halon, it hasn't been released in 26 years. Is it certain
17 that it will release if required? Is there any testing
18 going on now?

19 **DR. FEHRENBACH:** For the record, it is Paul
20 Fehrenbach speaking. I would like to direct that question
21 to Bill Shorter, if I may, the manager of NRU.

22 **MR. SHORTER:** Good morning. For the
23 record, my name is Bill Shorter.

24 I can confirm the halon system is tested
25 every six months by a firm that comes in and tests it for

1 us.

2 **MEMBER McDILL:** That is great. Thank you.

3 My next question is with respect to the map
4 with have run off on page 66 of CMD 05-H12. I can quite
5 easily see that 4.4 is twice 2.2, but are these cubic
6 meters per hour, minute? What are the units so that I can
7 get some kind of feel for this, please, maybe as it is in
8 staff's document?

9 **(SHORT PAUSE)**

10 **MEMBER McDILL:** It is Figure 8.3.

11 **MR. HOWDEN:** Barclay Howden speaking.

12 We will have to double check the units and
13 we will come back to you in a couple of moments.

14 **THE CHAIRPERSON:** It does raise a very good
15 point, though, that Dr. McDill has made before that it is
16 important for the diagrams to be as fulsome as possible in
17 this case. So I think this raises an issue that we will
18 want to look at in a more systemic basis as well.

19 Dr. McDill.

20 **MEMBER McDILL:** My last question is --

21 perhaps, Madam Chair, you will step on my toes if
22 necessary. On page 106 in the area of "Accident
23 Selection", were significant events over the last number
24 of years looked at and possibly considered in that
25 accident selection scenario?

1 **MR. LAMARRE:** Greg Lamarre for the record.

2 The two accident scenarios discussed within
3 the Environmental Assessment Screening Report come from
4 the FSAR, the Final Safety Analysis Report for NRU and are
5 bounding.

6 So in effect, to answer your question, the
7 recent events that have been reported staff feels are
8 still bounded by these two most credible events that are
9 considered within the FSAR.

10 **MEMBER McDILL:** Thank you.

11 **THE CHAIRPERSON:** Dr. Barnes.

12 **MEMBER BARNES:** Yes, there is a lot of
13 information in this document, and I appreciate all the
14 work that staff has done to pull this together. In the
15 end, I think it can be a little challenging reading this
16 and trying to deduce what is really of no significant
17 hazard or value compared to what are the standards and so
18 on, depending on the areas we are looking at. I am going
19 to focus on just a few issues at least to start off with.

20 One is the issue of the impingement and
21 entrainment dealing with the issue of the screen size on
22 the inlet for the NRU Reactor which entrains about 9,000
23 fish per year which appears to exceed normal regulations.
24 That is mirrored in the comments made by Fisheries and
25 Oceans Canada.

1 Two points: If that is against
2 regulations, I wonder why there has not been action taken
3 previous to this. Second, in that section on page 97, it
4 also refers to the chlorination effects twice a week which
5 is done for the controlled biofowling on the pumps. I
6 wonder if those effects are in addition to the 9,000 fish
7 per year. The conclusion reached by staff is that the
8 effects are measurable, obviously, but once again, those
9 magic words come in but not significant.

10 I am not sure it is not significant to the
11 9,000 fish but since this is against another federal
12 regulations agency, I wonder why nothing has been done on
13 this and why staff feels this is not too much of an issue?

14 **MR. HOWDEN:** I am going to pass that
15 question to -- Barclay Howden speaking. I am going to
16 pass that to Dr. Patsy Thompson. I would like to respond
17 to Dr. McDill's question.

18 The flow is the annual mean flow in million
19 cubic meters per year.

20 **MEMBER McDILL:** So ten to six cubic meters
21 per year?

22 **MR. HOWDEN:** Yes, that is correct.

23 I will ask Dr. Thompson to respond to Dr.
24 Barnes.

25 **DR. THOMPSON:** Patsy Thompson, for the

1 record.

2 In terms of why no action was taken
3 previously, the *Nuclear Safety and Control Act* came into
4 force in 2000, giving the CNSC a mandate to protect the
5 environment, but the mandate and the context of the Act
6 and Regulations focus on the use and release of hazardous
7 substances and nuclear radioactive substances.
8 Entrainment and impingement are sort of physical habitat
9 issues that are not covered by our Act.

10 In other situations where environmental
11 assessments have been done, because the CNSC is the
12 responsible authority when impacts are noted, this is
13 usually covered in the follow-up program which then
14 becomes a licensing requirement. So that explains why no
15 action was taken by the CNSC in the past.

16 In terms of the Department of Fisheries and
17 Oceans, they were notified of the issue by consultation
18 from the CNSC consulting them on the content of the
19 screening report.

20 In terms of the significance of the impact
21 of killing 9,000 fish per year, I will ask Dr. Glenn Bird
22 to respond to that question.

23 **MR. BIRD:** For the record, my name is Glenn
24 Bird.

25 As stated in the report, the killing of

1 9,000 fish per year or in a higher estimate of the
2 combined NRU and NRX intake systems, the 14,000 fish per
3 year is a measurable effect locally in that these are --
4 the perch, trout and rainbow smelt are small forage fish
5 and they are very protective, and that the estimated loss
6 of production in the river, the Ottawa River system, is
7 about 63 hectares of production.

8 In a small system, that would be most
9 significant but because the Ottawa River is a large
10 system, this is only a small fraction of the production
11 within the system and there is a lot of recruitment coming
12 from upstream and downstream. So we are not seeing a
13 major impact on the population.

14 **MEMBER BARNES:** Is that your reading of the
15 comments made by DFO? Is it still not in contravention of
16 Fisheries and Oceans Regulations?

17 I appreciate it may not be a requirement
18 under the Act but in terms of the operation of this
19 facility, it still has to meet other regulations, does it
20 not?

21 **DR. THOMPSON:** Patsy Thompson for the
22 record.

23 As noted in the screening report and in
24 comments made by the Department of Fisheries and Oceans,
25 this is in contravention to the *Fisheries Act* and measures

1 are being taken to address the steps that are being taken.

2 The DFO and AECL have started discussions
3 on the proper screen size to be implemented. The
4 guideline, the DFO has provided the guideline to AECL.
5 AECL will be undertaking a safety review to make sure that
6 putting in screen sizes that would limit the water intake
7 would not cause nuclear safety issues. So this is being
8 handled.

9 The process that DFO follows is if for
10 safety reasons the proper screen size cannot be
11 implemented, then DFO has the option of issuing
12 essentially a permit that is an exception from following
13 the *Fisheries Act*. Section 32, I believe states that it
14 is illegal to kill fish by means other than fishing. So
15 if a proper screen size can't be put in place to limit
16 fish kill, then DFO can issue a permit to kill fish by
17 means other than fishing.

18 So those are the options being pursued by
19 DFO and discussions have been initiated with AECL to
20 resolve this issue.

21 **MEMBER BARNES:** I think ---

22 **THE CHAIRPERSON:** Sorry, Dr. Barnes, I
23 think it might be appropriate to ask AECL to comment on
24 this.

25 **MEMBER BARNES:** Could I ask if officials

1 from Health Canada, DFO and so on are in the room today or
2 not?

3 **THE CHAIRPERSON:** I don't believe there are
4 any DFO officials here at this time but, if you agree,
5 then AECL will comment.

6 **DR. FEHRENBACH:** Thank you. It is Paul
7 Fehrenbach for the record.

8 As Dr. Thompson noted, we are working with
9 the Department of Fisheries and Oceans to address this
10 issue. We have conducted an evaluation, as was noted,
11 about the potential effects of fish impingement and the
12 findings indicate as stated that although they are
13 measurable it is not likely significant in a large body of
14 water such as the Ottawa River.

15 Nevertheless, we are moving forward with
16 the recommended options to detect which one is most
17 acceptable. We are hopeful that the engineering and
18 safety studies that are underway will identify a method of
19 implementing a screen size sufficient to exclude most of
20 these species from impingement and that that will be able
21 to be implemented without safety impacts on the reactor.

22 **MEMBER BARNES:** I would like to turn to the
23 issue of the tritium which has been acknowledged as being
24 one of the principal areas of concern, at least as
25 referred to both in the atmospheric release and also in

1 the groundwater issues.

2 Turn to the groundwater issues and there
3 are a number of facets here I would just like to touch on.
4 On page 40, there is a general statement about the --
5 basically the lower third of the page, the last full
6 paragraph, "In January 2003, et cetera, tritium-
7 contaminated groundwater is found near the Power House"
8 and it goes on to discuss the measures taken to try to
9 determine the source of that leak which, as I understand
10 it, is still not known. And it is not quite clear to me
11 because we have seen figures before of groundwater plumes
12 with increased tritium values and in this document at
13 least there are no sort of amounts to my recollection of
14 the actual plumes.

15 Could I get an update as to -- is that true
16 that we are still not quite sure where that tritium is
17 coming from and could you give us some indication of the
18 size of that specific plume that we are talking about?

19 **DR. FEHRENBACH:** Yes, thank you. It is
20 Paul Fehrenbach for the record.

21 I think at the outset we should mention
22 that we have once detected -- once we detected the
23 presence of this plume we did an additional number of bore
24 holes to try and pinpoint the source and further quantify
25 the amount of activity in the plume, and it is worth

1 noting that it is a very small fraction of the derived
2 release limits from the property.

3 It is also worth noting that recently, in
4 the latest set of measurements, the activity levels are
5 dropping significantly which leads us to suspect that the
6 source of the plume may well have been one of the active
7 drain lines that has been repaired and replaced near NRU,
8 as opposed to NRU itself, but we continue to investigate
9 and pinpoint the actual source. It will take continued
10 effort to do that.

11 I emphasize again it is a relatively small
12 leak that is causing this probably and is going to be
13 difficult to detect with a high degree of certainty.

14 **MEMBER BARNES:** So your last statement is
15 in contradiction to the last statement on page 40. It
16 says the result, "makes it unlikely that drain system
17 leakage could be the source." So this is an update on
18 that.

19 **DR. FEHRENBACH:** This is an update on that.
20 This is new information that we have just recently
21 received.

22 **MEMBER BARNES:** And what would be the kind
23 of the area of that plume? Do you actually have enough
24 groundwater control wells to be able to document the
25 extent of that plume?

1 **DR. FEHRENBACH:** For the record, it is Paul
2 Fehrenbach.

3 I would like to ask Ray Lambert to respond
4 more completely to the question.

5 **MR. LAMBERT:** For the record, it is Ray
6 Lambert, Atomic Energy of Canada.

7 Yes, we have done a number of manhole
8 measurements between NRU and basically down water from --
9 if I could think of it -- from NRU towards the Ottawa
10 River so we have a fairly good map of the shape of the
11 plume between NRU and the Power House, as Dr. Fehrenbach
12 mentioned. However, when it comes up to NRU, finding the
13 actual point of release will take a little bit of --
14 somewhat more effort.

15 In terms of area, you can imagine a plume
16 standing down from NRU towards the Power House.
17 Unfortunately, I can't describe a shape very well verbally
18 but we do have it well mapped.

19 **MEMBER BARNES:** I was surprised that there
20 were no such maps in this document since that is one of
21 the -- it seems to me -- significant releases. The
22 information given on page 109-110 indicates that all the
23 groundwater values are above the Ontario Drinking Water
24 Quality Standards and correct and therefore that is sort
25 of the point source. Enhanced contamination is flowing

1 towards the Ottawa River. The conclusions once again are
2 that there are no real measurable effects or no real
3 environmental concerns and that is one that someone might
4 wish to imagine might be a concern; yet, we don't, it
5 seems to me, really have the pertinent data to show the
6 potential for this concern in this document.

7 **THE CHAIRPERSON:** Would the staff like to
8 comment specifically, if Dr. Barnes agrees, on what AECL
9 said but also on the issues of the shape and nature of the
10 plume?

11 **MR. HOWDEN:** Dr. Patsy Thompson is going to
12 reply to that question.

13 **DR. THOMPSON:** Patsy Thompson for the
14 record.

15 The results -- there is as part of the
16 licensing document a requirement to do a groundwater
17 monitoring program and there are an extensive number of
18 wells in the area around NRU and the Power House. This is
19 reported to the CNSC annually and as part of our
20 compliance verification.

21 The report, the screening report on page
22 108 and 109, describes the assessment that staff has made
23 of the significance of the tritium contamination in the
24 groundwater and on the basis of radiation dose to --
25 potentially living in the soil above the bedrock concluded

1 that the radiation dose would not be significant and since
2 the drinking water -- the groundwater is not a drinking
3 water source then there is no potential exposure for a
4 member of the public or workers on site.

5 Having said that, staff, through their
6 compliance verification program, is tracking the issue of
7 releases, uncontrollable releases to groundwater from NRU,
8 and AECL has just updated the information on their effort
9 in that. So it is being verified and followed up through
10 our normal compliance activity.

11 **MEMBER BARNES:** And two other related, more
12 specific, questions that refer to figures and tables on
13 figure 8.2, which is the stereographic cross-section of
14 the CRL site within the centre of the developed area, you
15 show a number of these wells. Relatively few of these
16 penetrate into the bedrock, which is fractured granitic
17 gneiss, and I wonder, do you have -- which is basically at
18 the level of the water table -- can you convince me that
19 there is adequate hydro-geological control to show the
20 potential for migration of such contaminants that we are
21 talking about within the bedrock?

22 On Table 8.2 you give porosity, but of
23 course this is fractured bedrock, so we are dealing with
24 fracture flow rather than as far as media flow here.

25 **(SHORT PAUSE)**

1 **MR. HOWDEN:** Barclay Howden speaking.

2 We can't reply directly to the bedrock
3 question because we don't have that information with us,
4 right at the moment.

5 **MEMBER BARNES:** One might assume that, as
6 that figure 8.2 shows, that there is a good deal of sand,
7 silty fine sand and medium fine sand, which most of the
8 wells penetrate that hydro-geologically most of the
9 contaminants might flow through the glacial sand deposits.

10 On Table 8.2, which is on page 71, you give
11 values, again, of porosity for the sand -- that is the
12 last item in Table 8.2 -- and the porosity given there is
13 35 to 45 per cent. Is that a real value? Are you going
14 to tell me that there is 45 per cent porosity in these
15 sands?

16 **(SHORT PAUSE)**

17 **DR. THOMPSON:** Patsy Thompson, for the
18 record.

19 The information in table 8.2 is based on
20 reports provided to the CNSC by AECL that have been
21 reviewed by our geoscience specialist. So the information
22 appears to be sound.

23 In terms of the issue of porosity and the
24 fractured bedrock, the information we have is that
25 groundwater flows towards the Ottawa River at a rate of

1 between 10 and 100 metres per year and that is the basis
2 for the assessment that is being used in this report.

3 **MEMBER BARNES:** Yes, but that is mainly
4 within the quaternity sands, as opposed to bedrock, right,
5 or is that in total?

6 **MR. BIRD:** Those flow rates are for within
7 the upper layer of the rock itself that has been reported
8 by AECL.

9 **MEMBER BARNES:** In the fractured basin?

10 **MR. BIRD:** In the fractured rocks.

11 **MEMBER BARNES:** Okay.

12 **THE CHAIRPERSON:** Dr. Barnes, if you agree,
13 we will ask AECL if they have any comments on that.

14 **MEMBER BARNES:** Right. And I might also
15 ask AECL if they want to comment on the 45 per cent
16 porosity reported in these sands.

17 **DR. FEHRENBACH:** Thank you. It is Paul
18 Fehrenbach, for the record.

19 Unfortunately, we don't have our geoscience
20 experts with us and so we cannot really add further to the
21 clarification of your question, Commissioner.

22 I would note that the information that is
23 being quoted in the Screening Report comes from a report
24 we had commissioned by Raven Beck Environmental Limited
25 who did this assessment for us.

1 **MEMBER BARNES:** I saw the reference to it
2 at the bottom of the page, but at 45 per cent you can see
3 that there is -- you know, you have to ask what kind of
4 sand these particular spheres of sand -- and to get 45 per
5 cent is rather exceptional. If you were in the oil
6 industry to get 45 per cent you would be leaping up and
7 down, right, because it is almost impossible to get that.

8 It also means, if you get 45 per cent, that
9 you have got a lot of potential for rapid migration of
10 fluids through it. That is what I am trying to get at
11 with the tritium plumes and so on, for which we have no
12 maps.

13 **DR. FEHRENBACH:** Yes, Commissioner, I would
14 note that the hydraulic conductivity is reported
15 separately, as a separately measured number, as well.

16 **MEMBER BARNES:** I wonder if I could -- just
17 maybe one other final question, Madam Chair, and that is
18 the airborne emissions. This is reported on Table 8.9.
19 This is from the Power House. And the value for basically
20 the last five years, '98 to '93 for CO2 is 31,000 tonnes,
21 give or take, and there are also values of NOx and SOx SO2
22 in there, which again are substantially above the
23 thresholds, which I realize is a threshold, given in Table
24 8.10 on the lower part of page 75.

25 So I wonder if staff -- I appreciate that

1 this is, in a sense, a point source in a location and it
2 may not contravene our own Act -- but nevertheless we are
3 looking at the environmental issues of this particular
4 nuclear facility. And elsewhere in the report, page 91,
5 it is pointed out that this represents -- for the CO2
6 levels -- .0067 per cent of the national total. It still
7 seems to me this is a substantial amount of emissions from
8 this one plant.

9 Again, the conclusion is that it is
10 essentially insignificant and not a concern. Is that
11 really what we should be examining here, or should we be
12 asking whether this value -- whether AECL, in the spirit
13 of cleaner air, in fact, shouldn't be looking at
14 technologies to try to reduce this level?

15 So for this kind of plant, is that level of
16 emissions, particularly those three values, or
17 particularly for CO2, is that what we should be expecting?

18 **DR. THOMPSON:** Patsy Thompson, for the
19 record.

20 The Screening Report essentially looks at
21 past emissions and predicted future emissions, to be able
22 to make a conclusion on the potential environmental
23 effects of the continued operation of the NRU reactor.

24 The information has been reviewed by
25 Environment Canada and the conclusion is supported by CNSC

1 staff, as well as by Environment Canada staff.

2 In terms of the thresholds for the criteria
3 air contaminants, those are reporting thresholds for
4 Environment Canada to be able to have an inventory of
5 releases nationally.

6 In terms of whether this is acceptable from
7 an operating point of view, this is more an issue that we
8 would look at under our compliance program. And through
9 our audits of the AECL Environmental Management System,
10 for example, we would look at pollution prevention
11 initiatives and Environment Canada gets reports and is
12 involved in some compliance verification activities with
13 CNSC staff.

14 So this can be pursued through our normal
15 licensing and compliance program. But, for the purposes
16 of the assessment, under CEAA to be able to make a
17 conclusion, we had to look at current emissions and we
18 base the assessment essentially on the continued operation
19 to make sure that we were conservative in our assessment.

20 **MEMBER BARNES:** I understand that, but in
21 certain cases where there is a feeling that the emission
22 levels are too high, that is the point of the Follow-up
23 Program, and I didn't notice this being one of the
24 activities being directed within the Follow-up Program.

25 I am just asking, really, whether this is a

1 value that should be of concern?

2 **DR. THOMPSON:** Patsy Thompson, for the
3 record.

4 The information we have and the reviews
5 that have been done by Environment Canada do not give us
6 any information to say that this is a concern and should
7 be pursued aggressively. So we are satisfied that the
8 operation is in compliance with our requirements, but also
9 other requirements.

10 The Follow-Up Program is intended to deal
11 with issues of, for example, non-conformance or where
12 there is a need to verify the predictions that have been
13 made in terms of environmental impacts.

14 In this case, the environmental
15 significance of those releases are low and not significant
16 and it wasn't deemed necessary to put it in the Follow-Up
17 Program.

18 **THE CHAIRPERSON:** Dr. Dosman.

19 **MEMBER DOSMAN:** Thank you, Madam Chair. I
20 have several questions, one for AECL and several for
21 staff.

22 I wonder if I might, Mr. Van Adel, ask you,
23 on the issue of the length of life of the NRU in the 1990s
24 -- 1996 was predicted the NRU would be phased out by this
25 time. And just judging from the tone of your comments, I

1 wonder if you might share some of your long-range
2 thinking?

3 Do I now take it that it's quite possible
4 that the NRU might be refurbished? You indicated 2012 but
5 possibly for the indefinite future with successful
6 refurbishment?

7 **MR. VAN ADEL:** Thank you. Bob Van Adel,
8 for the record.

9 We have been continuously in dialogue with
10 the Government of Canada, various departments in the
11 government and with the NRC and other users of the
12 facility.

13 On the question of the longevity of the NRU
14 and what we might do to replace the NRU by way of meeting
15 the requirements for a long-term research facility or
16 another research facility and to cover the other functions
17 once the primary isotope production activity is
18 transferred to the DIF.

19 About four and a half years ago, five years
20 ago, when the Government of Canada examined the issue,
21 there was some momentum around replacing the NRU with a
22 new research reactor, a brand new facility, but the cost
23 of that was judged to be very large and also, there was
24 some issue in the government's mind about the long-term
25 future of the nuclear industry and whether the power

1 industry was going to continue to grow and therefore place
2 demands on a future facility or whether it was going to,
3 in fact, slowly be phased out.

4 As well, there were questions about what
5 might be the real requirement for a replacement reactor
6 and what might it look like.

7 And so AECL, when the government decided to
8 delay that decision for some time, AECL embarked on
9 examining alternatives because we realized at some point
10 that the NRU reactor will reach a point at which it is
11 desirable not to carry on.

12 And so there are a number of proposals that
13 have been looked at and one of them is the possible
14 refurbishment of the NRU reactor; that is, a complete
15 makeover of the reactor, which off the top of my head I
16 recall the cost of that would be something in the order of
17 \$200 million, to suggest that that is not just a trivial
18 sort of -- we are not fixing a few pieces of equipment.
19 That would be a full refurb of the reactor and that would
20 extend its life for 30-35 years, according to the
21 assessments.

22 And many of our counterparts around the
23 world have taken that approach and there are many examples
24 which I could cite here, reactors of 1960s genre, research
25 reactors having been completely refurbished in a similar

1 manner.

2 But we are also examining the possibility
3 of a brand new facility and that has many variations. It
4 could be a facility that meets some of the needs of the
5 scientific R&D community or meets all of the needs that
6 everyone might have, including some international
7 dimension.

8 So as a corporate priority -- and I will
9 talk about these later -- but as a corporate priority, we
10 have this year said and notified the government that we
11 are accelerating the examination of those issues and that
12 we want to engage with the government, starting in the
13 fall, in a dialogue about specifically which of those
14 options might be the most attractive so that we are
15 planning to replace the reactor at a reasonable point in
16 time as opposed to simply allowing ourselves to get into a
17 situation where we are under time pressure and other
18 constraints.

19 So I believe that if we are successful in
20 our endeavours, you will see that become part of the
21 agenda at the government decision making level and there
22 will be potentially Cabinet level discussions leading to
23 an acceptance of a recommendation for what to do in the
24 medium to long term.

25 So we are addressing it today and continue

1 to do so, but we have increased the emphasis on bringing
2 this to people's attention so that we don't end up with a
3 so-called neutron gap in terms of the R&D community and
4 the other uses.

5 **MEMBER DOSMAN:** Thank you.

6 Madam Chair, if I might ask some specific
7 questions relating to worker health?

8 And I note that perhaps for AECL that there
9 are some 82 workers, at least in 2003, judging by Table
10 8.5, that are operating the NRU on a regular basis and
11 their average whole-body dose equivalent was 7.5
12 milliSieverts. And I am just wondering; that is an
13 average dose and I wonder if AECL or staff, or perhaps
14 both, might comment on what the range was and whether
15 there were any workers that were approaching 50
16 milliSieverts for the year or 100 milliSieverts over a
17 five-year period?

18 **DR. FEHRENBACH:** Paul Fehrenbach, for the
19 record.

20 I would like to direct that question to Ray
21 Lambert, the Director of Health and Environmental
22 Programs.

23 **MR. LAMBERT:** Thank you. For the record,
24 Ray Lambert, AECL.

25 The maximum dose at Chalk River in 2004 was

1 15.8 milliSieverts below our -- the average doses
2 typically range, with the majority of people, somewhere
3 below 10 milliSieverts, typically around 5. I don't have
4 a report that gives specifically NRU. I am reading from
5 our Chalk River Annual Report.

6 **MEMBER DOSMAN:** All right.

7 And, Madam Chair, if I might, that is the
8 point that I would like to make, that I see data for the
9 average across Chalk River, but it was specifically for
10 employees and operators at the NRU facility that I was
11 wondering about maximum doses. We have got the average,
12 but it would be nice to have the range.

13 **MR. LAMBERT:** Ray Lambert again with Atomic
14 Energy of Canada.

15 The maximum dose I recited is from NRU.
16 The individual received it while working in NRU.

17 The range of exposures in NRU are shown at
18 Table 8.5. Sorry, the average is shown in 8.5. The
19 range, if I recollect, will be somewhere between 1
20 milliSievert to about 10-11 milliSieverts. As I said,
21 maximum of 15, average of 7.5, but that is by memory I am
22 reciting.

23 **DR. FEHRENBACH:** I would note,
24 Commissioner, that the numbers show a decrease over time
25 and that that is one of our metrics that we follow closely

1 and put a lot of stock in is monitoring and reducing doses
2 to both workers and to the public.

3 **MEMBER DOSMAN:** Thank you.

4 I am wondering, Madam Chair, if I might ask
5 staff to comment?

6 **MR. HOWDEN:** Barclay Howden speaking.

7 Our radiation protection specialist is
8 Caroline Purvis, who is here. I will ask her to comment
9 on our view of the doses as well as the control of doses
10 within the NRU Reactor. Thank you.

11 **MS. PURVIS:** For the record, I am Caroline
12 Purvis, Radiation Safety Specialist.

13 Yes, we concur with the reported doses as
14 Mr. Ray Lambert stated. AECL has instituted a
15 comprehensive ALARA Program in the past year, and so the
16 control of doses has certainly increased for special jobs.

17 So yes, we would concur that the doses are
18 showing a small downward trend and we are satisfied with
19 the control of doses to workers in NRU.

20 **MEMBER DOSMAN:** Thank you, Madam Chair.

21 I wonder if I might go on to Table 8.7?
22 Perhaps staff, since staff has assembled this table,
23 Summary and Comparison of Employees Safety Performance at
24 CRL site. And there's two issues. One is the "Severity
25 of Injuries" row is blank and I was just wondering if that

1 was inadvertent or if staff could provide any further
2 information on that seeming lack of information?

3 **MR. HOWDEN:** Barclay Howden speaking.

4 The "Severity of Injuries" is actually
5 listed below that line for Chalk River site and in the
6 U.S. NSC. So the line with "Severity of Injuries" is just
7 like a heading.

8 **MEMBER DOSMAN:** Thank you. I can see now
9 what you have done.

10 The number of 17 in 2002, is that a large
11 number and were any of these life-threatening, or what was
12 the severity of the injuries?

13 **MR. HOWDEN:** Barclay Howden speaking.

14 That information was provided to AECL, Dr.
15 Dosman, so I would like to suggest that they respond to
16 that question.

17 **MEMBER DOSMAN:** AECL, may I ask you to
18 respond, please?

19 **DR. FEHRENBACH:** Paul Fehrenbach for the
20 record.

21 I would like to direct that detailed
22 questions to Ray Lambert, please.

23 **MR. LAMBERT:** For the record, Ray Lambert,
24 AECL.

25 Most of the accidents occurring at Chalk

1 River are your typical slip-falls, pulling back strains.
2 Severity represents the number of days lost as a result of
3 either going to a physician or resting up in bed.

4 I don't have a record in front of me. I
5 can't, off the top of my head, think of any serious injury
6 that occurred but I'm going by memory.

7 **DR. FEHRENBACH:** Again, just for
8 clarification, I would like to point out that that is
9 another one of the metrics that we follow very closely.
10 And while the data here goes up to 2002, we are
11 experiencing now again a downward trend in both the
12 frequency and severity of lost-time injuries on the site
13 with a more aggressive Occupational Health and Safety
14 Program that we have introduced.

15 **MEMBER DOSMAN:** Thank you for that
16 information, Mr. Fehrenbach.

17 I might just ask staff, on the table next
18 to page 112 of CMD 12.A, I wonder, would staff be willing
19 to help interpret this table for me? The writing is quite
20 small and there are no headings on the table, and not
21 withstanding my new glasses, I am having a little
22 difficulty handling this table.

23 **MR. HOWDEN:** Barclay Howden speaking.

24 Claude David will respond to your question.

25 **MR. DAVID:** For the record, my name is

1 Claude David.

2 This is what we call the Interaction Table.
3 The top row lists the environmental components that were
4 examined. The side row to your -- or the side column on
5 the left-hand side of the table lists the various
6 installations and activities that actually form part of
7 the scope of project. So each of the items you see on the
8 left-hand side column were examined with respect to each
9 of the environmental components that are listed in the top
10 row.

11 Now, the numbers actually identify the
12 actual interactions. In the presentation it was mentioned
13 that 86 interactions were identified for the purposes of
14 this assessment, and we could have used dots to identify
15 those interactions but we decided to use numbers so we
16 could better track the further assessment of those
17 interactions and relate those to those numbers on this
18 Table.

19 **THE CHAIRPERSON:** Do you have a further
20 question, Dr. Dosman?

21 **MEMBER DOSMAN:** Yes.

22 So is this table, if you like, a summary
23 that prepares us for Table 9.1; is that the idea?

24 **MR. DAVID:** Yes, that is correct. Each of
25 those interactions should appear in Table 9.1.

1 **MEMBER DOSMAN:** Thank you.

2 I have one other question for staff. It's
3 a fairly minor detail question that refers to Table 8.8.
4 I note that for arsenic the number of 3.55 plus or minus
5 14 in 1998 is exactly the same number as 3.55 plus or
6 minus 14 listed for the five-year average, and while that
7 could occur by chance, I am just wondering if there is any
8 possibility of an error in that table?

9 **MR. HOWDEN:** Could I clarify your question,
10 Dr. Dosman? Are you talking about the Argon-41 on the
11 top? Okay. Thank you.

12 **(SHORT PAUSE)**

13 **THE CHAIRPERSON:** If you would like to have
14 time, staff, to do that, if Dr. Dosman agrees, we could
15 come back with a clarification of that so that we are not
16 spending time looking at it.

17 **MEMBER DOSMAN:** Most certainly.

18 **DR. THOMPSON:** Patsy Thompson, for the
19 record.

20 On Table 8.8, the first row refers to
21 Argon-41. Essentially the five-year average 3.55 time
22 stamp to the 14 is coincidentally the same as the 1998
23 number. So it is a coincidence but the number is factual.

24 **MEMBER DOSMAN:** Thank you.

25 **THE CHAIRPERSON:** Mr. Taylor.

1 **MEMBER TAYLOR:** Thank you, Madam Chair.

2 My first question relates to a detail of
3 the scope of the project. Could staff please clarify for
4 me that Figure 5.1 represents graphically the scope of the
5 project? Paragraph 5 of the report is entitled the "Scope
6 of the Project".

7 **MR. HOWDEN:** Mr. David will reply.

8 **MR. DAVID:** For the record, my name is
9 Claude David.

10 The scope of project, if we are going to
11 use this Figure 5.1 -- the scope of the project assessed
12 for this environmental assessment included all of the
13 installations within the NRU building, and that includes
14 the area for back-up power. It also includes the NRU
15 Reactor and the experimental facilities, and there is a
16 bay-water area. It also included the roof vents that are
17 located on the roof of the NRU building.

18 The scope of the project also included the
19 assessment of Tank 1, which has now been replaced by a new
20 holding tank facility. That was included as part of the
21 scope of the project.

22 Also part of the scope of the project was
23 the Switchyard/Powerhouse. This facility provides the
24 power to allow the NRU Reactor to operate.

25 Also included in the scope of the project,

1 bottom left-hand corner, is the Fuel Fabrication Facility.
2 The two facilities themselves, which my understanding is
3 where we manufacture the fuel that goes into the NRU
4 facility, and perhaps AECL could expand on that a bit
5 more.

6 Also included in the scope of the project
7 is the waste management areas in terms of the wastes that
8 are generated from the operation of the NRU facility.
9 Different types of waste are routed to various waste
10 management areas, and I'm referring to solid waste in this
11 case.

12 Also included as part of the scope of the
13 project was the active liquids that are routed to the
14 waste treatment centre via Tank 1 or the new -- now the
15 new ---

16 **MEMBER TAYLOR:** Sorry. Maybe I can
17 interrupt you, just to save time. At the bottom of that,
18 underneath the drawing of the NRU building, is the MOLLY-99
19 production and the FISST tank. Are those included in the
20 scope of the project?

21 **MR. DAVID:** The MOLLY-99 and FISST tank
22 were not included as part of the scope of this project.

23 **MEMBER TAYLOR:** Thank you. That is why,
24 because I noticed in one of the answers you said that
25 operation of the MOLLY-99 production wasn't part of the

1 scope of the project and I couldn't quite understand it
2 because I had assumed that all these things were part of
3 that. Okay. Thank you.

4 The only other comment I have is in the
5 main description of the project, in Chapter 7, for
6 example, in 7.7, "Plant Life Management Program", the
7 staff described the plant life management program in a
8 paragraph: It is currently implemented to ensure that all
9 structures, et cetera, et cetera, meet the requirements
10 for continued operation.

11 I am sure that the objective of the
12 program, but is it a reasonable description of the program
13 given the various incidents that have occurred in the last
14 year or so?

15 **MR. LAMARRE:** Greg Lamarre, for the record.

16 Just for clarity sake, the plant life
17 management program is being considered under the future
18 license ability extension, a licensing decision that will
19 come to the Commission this fall and next year. The
20 statements in there, as the Commission member has noted,
21 are perhaps not totally accurate in that the plant life
22 management program isn't at this point fully implemented.
23 We will be reporting back on that in greater detail in
24 October and then in 2006 as to the measures put in place
25 by AECL in support of their license ability extension

1 program.

2 What they currently have, as AECL staff
3 previously mentioned, is an aging management program that
4 looks at obsolescence and degradation and repairing those
5 systems and components as they come up for renewal and
6 replacement. To go with that will be AECL currently
7 putting in place a comprehensive plant life management
8 program and periodic inspection program that, as I said,
9 we will be able to comment on further at the next set of
10 hearings if a positive decision is taken by the Commission
11 members on the Environmental Assessment Screening Report.

12 **MEMBER TAYLOR:** Okay, thank you.

13 **THE CHAIRPERSON:** Mr. Graham.

14 **MEMBER GRAHAM:** Thank you. Some of my
15 questions have been or asked, but as a follow up I have
16 three lines of questions.

17 As a follow up to Dr. Barnes, with regard
18 to questions with regard to the fish kill, my specific
19 question would be you gave a specific amount, 9,088. This
20 is to AECL. So I would presume that they were counted so
21 you could get that number. That is not just a -- they
22 were actually counted as they were.

23 To see that many fish killed, was there not
24 some sort of concern that you were in contravention of the
25 DFO regulations and so on before this screening came

1 about?

2 **DR. FEHRENBACH:** For the record, it is Paul
3 Fehrenbach.

4 I would like to ask Ray Lambert to respond
5 to that question, please.

6 **MR. LAMBERT:** Ray Lambert, for the record.

7 The study undertaken to determine the
8 impact on the fish at NRU included consultation with DFO
9 and sharing our report with DFO at the time. There was no
10 indications in our communications with DFO or feedback
11 that would lead us to believe we were in any non-
12 compliance with regs.

13 The study was undertaken in 2002. Further,
14 in our discussions with DFO at this time, though there are
15 guidelines that we are applying against -- we are applying
16 guidelines recommended or put forward by DFO to determine
17 what is required in terms of screening or trying to keep
18 fish out of the water intake, but there still is a part in
19 the regulations that accepts -- that recognizes that DFO
20 can give an exemption for the intake.

21 So I believe it was perhaps understood back
22 in 2002 that we likely felt we were within that clause.
23 So there was no feedback at the time with DFO that told us
24 we were in non-convention and they had no concerns with
25 the report when we presented it to them in 2002.

1 **DR. FEHRENBACH:** Just for further
2 clarification if I could, Commissioner, the study that we
3 are talking about where the documented data came from was
4 the result of a count. It was done as part of the
5 environmental effects review which was undertaken in 2002
6 and that these are relatively small fish, the bulk of them
7 that we are talking about. So the numbers can be quite --
8 -

9 **MEMBER GRAHAM:** I realize that but I guess
10 my question is the 9,088 fish were over what period of
11 time?

12 **MR. LAMBERT:** One year.

13 **MEMBER GRAHAM:** One year? Was any
14 application ever made to DFO for an exemption?

15 **DR. FEHRENBACH:** Paul Fehrenbach, for the
16 record.

17 Those discussions are underway, as was
18 discussed earlier, with respect to the -- if possible, we
19 will introduce screen measures to further exclude small
20 fish from impingement and if not, if that is not possible,
21 then we will continue the discussions with respect to an
22 exemption.

23 **MEMBER GRAHAM:** I guess the only reason my
24 line of questioning is this way is that this dates back to
25 2002, I believe, and that study was -- was that 9,088 done

1 in 2002 or 2003 or was it just done recently?

2 **DR. FEHRENBACH:** Paul Fehrenbach, for the
3 record.

4 I would like to ask Ray Lambert to provide
5 that clarification.

6 **MR. LAMBERT:** The report on the fish study
7 was released in 2002. There has been no other fish study
8 done at NRU. We are currently doing another fish study on
9 the water intake on our NRX -- what we call our water
10 intake for NRX which is the waters, including water for
11 our MAPLEs.

12 **MEMBER GRAHAM:** As a follow-up, and I am
13 not going to belabour any longer, but my concern is that
14 you were aware of this in 2002. We are in 2005 and we are
15 still studying -- and it is still being studied. The time
16 lapse it takes to have things, to have problems resolved
17 is of concern.

18 My question would be to CSNC staff. Do you
19 concur that it takes a long time to have something
20 resolved, especially an issue like this?

21 **DR. THOMPSON:** Patsy Thompson, for the
22 record.

23 In terms of the issue that needs to be
24 resolved, the issue is now part of the follow-up program
25 to the environmental assessment and DFO has indicated that

1 their expectation is that this be resolved for the fall.
2 So the timelines now are quite short.

3 In terms of what has happened in the past,
4 it is difficult to say whether this is a reasonable or
5 unreasonable timeline. In terms of staff's review of the
6 environmental effects review documents, the documents were
7 submitted to us over an extended period of time and staff
8 commented on this issue that this is something that needed
9 to be followed up by AECL and it is being done now. But
10 the environmental effects review -- the review of this
11 document by staff was finalized, I believe, in the fall
12 and we have -- AECL has addressed our comments and are
13 implementing the items that needed to be followed up.

14 **MEMBER GRAHAM:** I am still concerned that
15 it takes nearly three years to resolve a problem of screen
16 size and so on.

17 Anyway, my other question with regard ---

18 **THE CHAIRPERSON:** Sorry, Mr. Graham, I
19 wonder if I can do a supplementary on that ---

20 **MEMBER GRAHAM:** Sure, sure, go ahead.

21 **THE CHAIRPERSON:** --- as I think you have
22 raised an interesting point.

23 My sense is the line of questioning that a
24 number of Commission members have taken on this is it is
25 really not the role of an environmental assessment to pick

1 up long-term issues on a facility. It is to say that if
2 we continue operating it, what will be based on our
3 present information, what are the future projections which
4 would, you know, seem to me quite different than -- it is
5 quite different than what we would consider an important
6 issue.

7 This facility is located on water. It is
8 located on a river. It would seem to us, and I think we
9 are somewhat aware, as some of the Commission members have
10 said, is that there have been a number of issues that we
11 have had to follow up with and talked about Environment
12 Canada and now we are talking about Fisheries.

13 I think that it does raise legitimately in
14 the mind of the Commission the issues of the connection
15 between the Environmental Effects Study, environmental
16 oversight per se, the involvement of other federal bodies
17 and ensuring on the part of both -- the primary
18 responsibility resting with the licensee but also a
19 coordination responsibility on the staff that we are
20 taking enough of a holistic systematic look at these
21 facilities to ensure that if we didn't have this EA that
22 it would be going on.

23 So my sense is from your comment, Dr.
24 Thompson, that this -- and please correct me if I am wrong
25 -- is that this was identified in the Environmental

1 Effects Study that was done by AECL, if I am correct; that
2 it was analyzed and even if we hadn't had this EA, that
3 that would have been raised to the proponent and to DFO
4 and been handled.

5 That is the concern, I think. Would this
6 have been detected in what we think is a pretty self-
7 evident issue, which is the impact on fish in the Ottawa
8 River which is right next door to the facility. So that
9 is, I think, the question, Dr. Thompson.

10 **DR. THOMPSON:** Patsy Thompson, for the
11 record.

12 In terms of the review done by staff, the
13 issue was identified. We have, I would say, a well-oiled
14 working relationship with Environment Canada in terms of
15 dealing with issues that are of common interest.

16 In terms of working with the Department of
17 Fisheries and Oceans, the relationship isn't as well
18 developed. We have been working with the Department of
19 Fisheries and Oceans on similar issues for nuclear power
20 plants in Ontario and getting staff from DFO to respond to
21 communication from the CNSC in a timely manner has not
22 always been easy. This situation has been resolved and we
23 believe that what has happened over the last few months
24 has given us a better understanding of the process that
25 DFO follows and whose door we should be knocking on.

1 So moving forward, the relationship with
2 DFO is one that has improved and I think will continue to
3 improve. So we should not see such delays in responding
4 or dealing with issues in the future.

5 **THE CHAIRPERSON:** I suppose what I
6 understand broadly, and also in the specific instance, I
7 mean, this is the responsibility of DFO. It is the
8 *Fisheries Act*. It is not our Act. We do have a
9 responsibility for coordination, a responsibility of
10 oversight of facilities, but I guess what I am hearing
11 here is we are not just talking to CNSC staff and we are
12 not just talking to the proponent but we are talking to
13 DFO about their responsibilities and their
14 accountabilities as well for oversight in this particular
15 facility. I think that is important as well.

16 Back to Mr. Graham. Sorry, Mr. Graham.

17 **MEMBER GRAHAM:** Well, that is quite all
18 right because what I wondered the other day when I was
19 reading this was whether if we hadn't had the screening,
20 would some of these things have been caught or not or is
21 it -- or fleshed out or is this just part of the ongoing
22 and it got written up in this as part of ongoing work that
23 was being done, or is it relevant only to an EA screening.

24 Along that same line, and I don't want to
25 get into a licensing question, but I do want to ask a

1 question with regard to staffing, training and especially
2 unplanned events.

3 The reportable events, there was a mention
4 in your presentation, in AECL's presentation, that the
5 unplanned events and the study of root cause, detailed
6 root cause investigations.

7 Just for clarification or more or less
8 satisfaction of mind, all of your unplanned events, has
9 there been a root cause followed up and -- first of all,
10 AECL and then the CNSC staff -- are you satisfied that a
11 root cause analysis has been successfully completed on all
12 those unplanned events?

13 **THE CHAIRPERSON:** And I think the
14 connection to the EA is that we are really looking at the
15 future planning, particularly the effect on environmental
16 areas.

17 **DR. FEHRENBACH:** For the record, it is Paul
18 Fehrenbach speaking.

19 Our event investigation method is in place.
20 We do root cause analyses on every event and we track the
21 follow-up.

22 However, I must say that the robustness of
23 our process is not what we would like it to be at this
24 time. It has been noted as an area for improvement and we
25 are working hard to improve it.

1 I am prepared, if you are interested, to
2 discuss some of the various things we are doing to improve
3 the process but it will address both the backlog of
4 actions that we have for the lower levels, significance
5 items as a result of root cause investigations and the
6 timeliness of completion of those.

7 **MEMBER GRAHAM:** I think those can be dealt
8 with at the time of licensing if that proceeds to that,
9 but I guess what I wanted to know is you are not satisfied
10 and you are working on trying to improve it? I guess that
11 is your basic answer and I wonder if CNSC staff would like
12 to answer or comment also?

13 **MR. HOWDEN:** Thank you. Barclay Howden
14 speaking.

15 I am going to ask Greg Lamarre to give you
16 some comments, but as an introductory note, for the
17 purposes of the EA, the two events that are described, we
18 are satisfied that they are boundings such that the
19 effects can be used for the environmental assessment. But
20 clearly, the ongoing evaluations of the events in day-to-
21 day operation are important because they may shed new
22 information on these bounding events. At this moment we
23 are still satisfied the bounding events are indeed the
24 bounding events.

25 But I will now ask Greg Lamarre to comment

1 on our day-to-day view of the assessment of the events or
2 investigation of the events.

3 **MR. LAMARRE:** Greg Lamarre, for the record.

4 I will be brief because I am sure these
5 discussions will come up this afternoon.

6 Essentially, we concur with Dr.
7 Fehrenbach's comments that we see deficiencies in AECL's
8 -- what they call their OPEX program, their Operational
9 Experience Program that drives the root cause analysis,
10 the identification of deficiencies and the corrective
11 actions that then fall out.

12 We have got concerns that AECL is not
13 consistently hitting the root causes such that the
14 corrective actions that are then identified truly get to
15 those underlying systemic-type issues and factors that
16 they need to prevent reoccurrence.

17 So essentially, in summary, we do have
18 concerns. There are some actions in place. There has
19 been a meeting in which staff and AECL discussed issues
20 and staff clearly laid out where they see the deficiencies
21 being in AECL's OPEX Program and AECL is to provide some
22 follow-up to that meeting as to how they are going to
23 correct some of those deficiencies in their OPEX Program.
24 But once again, I think we can get into more specifics
25 this afternoon, if you would like, unless you would like a

1 little bit more detail, Mr. Graham?

2 **MEMBER GRAHAM:** Well, that will be handled
3 at another time.

4 My other question was with regard to the
5 discharge, and it was on page 32 of the report, 7.5.4 and
6 I read there that "Chlorine is injected twice weekly into
7 the NRU pump well to control slime and algae formation".

8 The amounts of chlorine that are injected -
9 - and also I presume that then is discharged into the
10 Ottawa River because -- if I follow the reading of that,
11 and my question is, has there been an analysis done as to
12 the amount of chlorine that is being discharged, the
13 percentage or the control of how much is being discharged
14 into that pipeline and the effects it would have on the
15 Ottawa River?

16 That question would be first of all to
17 AECL.

18 **DR. FEHRENBACH:** Paul Fehrenbach, for the
19 record.

20 Yes, there is an analysis done and I will
21 pass the question to Ray Lambert for further
22 clarification.

23 **MR. LAMBERT:** For the record, Ray Lambert,
24 Atomic Energy of Canada Limited.

25 As you mentioned, chlorine is used in the

1 NRU water. The output from the NRU water goes into our
2 process sewer and the process sewer is analyzed for total
3 residual oxidant, which would include chlorine. However,
4 I understand there is also a residual report in our annual
5 reports on electrical monitoring and compared to
6 standards.

7 The standards also follow up a
8 recommendation coming of the EA for some additional
9 chlorine monitoring of the Ottawa River to verify our
10 understanding of what we are releasing and I believe we
11 are going to follow through on that.

12 **MEMBER GRAHAM:** Yes, well that was why I
13 was asking the question. I wonder if anybody else from
14 AECL would like to comment on what your future plans are
15 with regards to chlorine monitoring.

16 **DR. FEHRENBACH:** For the record, Paul
17 Fehrenbach. I would like Paul Lafrenière to add further
18 clarification.

19 **MR. LAFRENIÈRE:** Paul Lafrenière, for the
20 record.

21 Yes, two years ago we were involved with an
22 extensive study in the residual chlorine levels in the
23 water treatment plant. We brought in consultants who
24 analyzed our system and provided us with recommendations
25 on the optimization of the Chlorine Residual Program.

1 That has since been done and we have received an
2 endorsement on our practices there.

3 As far as the future is concerned, we are
4 currently involved with studies in a waste treatment plant
5 area. So this specific aspect would also be brought into
6 that area. Studies will be available I believe in the --
7 probably over the calendar year.

8 **MEMBER GRAHAM:** Would CNSC staff like to
9 comment on concurrence or requirements?

10 **DR. THOMPSON:** Patsy Thompson, for the
11 record.

12 Chlorinated waste water is a toxic
13 substance under Schedule 1 of CEPA and it is for that
14 reason that it is being not only monitored but there is
15 also an expectation that the use of chlorine be looked at
16 in terms of optimization of the amount of chlorine that is
17 being used.

18 It is recognized that chlorine needs to be
19 used to control biofouling but we expect AECL not only to
20 monitor the concentrations of chlorine going out but also
21 to do work to ensure that they have optimized the use of
22 chlorine. It is currently identified in the Follow-Up
23 Program to the environmental assessment.

24 **MEMBER GRAHAM:** Thank you. I had some
25 other questions but I will pass until -- okay.

1 The other question I had was with regard to
2 the power and I read somewhere, and I haven't found it
3 just yet right here now, that some of the lines, power
4 lines and so on to the pumps and so on, travel submerged
5 and so on, underwater and so on. I am not sure where I
6 have read it at the time but I had made notes to that.
7 And I guess testing of the lines and testing of auxiliary
8 power and so on, what is -- how is that done and is it
9 done in a safety manner? Electricity travels very well in
10 water, sometimes if there is a bad connection and so on.

11 My questions are, how often do you check
12 all of your -- for safety measures, all of your submerged
13 pumps and all of your electrical appliances -- not
14 appliances but the equipment that is below water, that is
15 submerged?

16 **DR. FEHRENBACH:** Paul Fehrenbach, for the
17 record.

18 In general, it is our practice not to have
19 electrical conduits submerged in water. We certainly have
20 a lot of buried services on the site that go through
21 conduits, closed conduits from what are typically
22 described as manholes or large concrete bunkers with
23 connections. So in terms of testing on those lines, you
24 periodically go in and have access to the various
25 junctions to ensure that the conduits remain fit for

1 service and the lines are not interfered with.

2 Further clarification on your question, if
3 there are any pumps and submerged cables, I will refer to
4 Paul Lafrenière or Bill Shorter, please, for further
5 clarification.

6 **MEMBER GRAHAM:** No, that can be left
7 because I will have to find it again without getting into
8 detail.

9 There was one other question I had, though,
10 with regard to -- and this had come up through some of my
11 notes from previous meetings -- with regard to storage
12 tanks, the new storage tank and there is the old one that
13 is being discontinued and I am trying to think of the
14 number and I can't get it.

15 But my concern is when you decommission the
16 storage tank that was leaking and so on, is it --
17 decommissioning, is that removed or how is that dealt with
18 or it is just left there and left until a later date for
19 decommissioning?

20 **DR. FEHRENBACH:** Paul Fehrenbach, for the
21 record.

22 The first thing that is done, of course, is
23 that the tank is drained and is put into a safe shutdown
24 state. There is a formal process of doing that before it
25 can be turned formally over to decommissioning. Once it

1 is in a safe shutdown state, such that the liquids are
2 removed from it and it is then safe to begin other work,
3 the decommissioning program puts a plan together to decide
4 how to further proceed.

5 Ultimately, the tank will be deconstructed
6 and removed from its location and the site, returned
7 either to another use, to brownfield condition or to
8 greenfield condition, depending on what the future
9 requirements for that particular piece of real estate are.
10 But the tank will not be left in its current condition
11 indefinitely.

12 **THE CHAIRPERSON:** My question is to CNSC
13 staff with regards to the table that you put forward as
14 the EA schedule and the typical CNSC EA versus the EA
15 process that was used for the NRU.

16 My questions are the following. Are you
17 convinced that this still meets the requirements of the
18 *Canadian Environmental Assessment Act* and what -- there is
19 going to be a follow-up on one of the interventions, one
20 of the following CMDs, I believe, on the issue of
21 transparency in a specific sense, but when you designed
22 the NRU EA process and implemented it, are you -- what
23 were the parameters that you followed in terms of ensuring
24 that this met what would be called a CNSC typical EA in
25 spirit if not exactly in timeliness?

1 So those are my questions to staff.

2 **MR. HOWDEN:** Mr. David will reply to it
3 first on whether it meets the requirements of the CEA Act,
4 and secondly, we do have a policy for consultation and why
5 we feel that we are satisfied that we have met our own
6 policy.

7 **MR. DAVID:** Claude David, for the record.
8 The issue of transparency involves the way
9 the screening report was prepared and for this particular
10 screening the studies were not delegated by the CNSC to
11 AECL for reasons that were previously explained.

12 There was a certain level of cooperation or
13 consultation between CNSC staff and AECL for the
14 preparation of the project description. The facility
15 itself is very much the heart of the whole Chalk River
16 Laboratory site and specialists and project officers
17 prepared the project description through reading many,
18 many volumes of documents, synthesizing, reducing that
19 information and then further reducing that information, to
20 come up with a project description that was both
21 reasonably short ---

22 **THE CHAIRPERSON:** Sorry, Mr. David, I think
23 I just want to go back to specifics.

24 I think if the Commission wants to have
25 questions with regards to the project description, that is

1 fine. I think, as Mr. Howden said, my questions were
2 really quite specific in terms of the analysis by staff of
3 those two questions.

4 So maybe, Mr. Howden, you could comment?

5 **MR. HOWDEN:** Yes. Barclay Howden speaking.

6 With regard to the requirements of the
7 *Canadian Environmental Assessment Act*, this Act does not
8 require consultation on a screening level report.

9 However, the policy of the CNSC has been to
10 consult on screening levels. So we do meet the
11 requirement of the *CEA Act*.

12 In terms of our policy, we normally have a
13 consultation period on the guidelines and the screening
14 report.

15 In this case what we did was we put the
16 draft guidelines out. There was an opportunity to
17 comment, which is our normal process.

18 We put out a preliminary screening report
19 with an opportunity to comment, which is our normal
20 process.

21 We put out a draft screening report after
22 the preliminary screening report was reviewed, which
23 included the disposition of the comments by stakeholders,
24 including members of the public.

25 The difference was, is that that period of

1 time from that point to the hearing was quite short. It
2 was a one-week period, as normally there is about a 30-day
3 period. However, in doing this we were satisfied that
4 there was adequate consultation done because we did engage
5 people and they did comment.

6 Two, we went out to -- specifically
7 contacted each known stakeholder in advance and actually
8 supplied the information to them directly. So we were
9 targeting them to make sure that they did not get missed.

10 Third thing, we did put advertisements in
11 all the local papers to try to make sure anyone that we
12 had not been able to target would have an opportunity.
13 And we did capture one person that we had not targeted who
14 did come in. That was Mr. Hendry.

15 Finally, AECL, during the preparation of
16 the screening report which is being done by us, did hold
17 public consultation activities. There were four. We
18 attended three, such that we could be satisfied that there
19 was sufficient time for -- there was sufficient
20 opportunity for people to get involved. As well, these
21 consultations were done in more than one place, so that
22 there was a geographical spread.

23 We were in Quebec, Deep River, Pembroke --
24 I am not sure where the fourth place was. So with all
25 that combined, we felt that the consultation was adequate

1 and that there was sufficient transparency so that people
2 would have the opportunity to comment.

3 In terms of transparency, as Mr. David has
4 said, in order for us to get this environmental assessment
5 factually correct for you, it was necessary to liaise with
6 AECL to make sure that we had the facts. The assessment,
7 though, was done by CNSC staff. So the independence was
8 introduced there.

9 I will just conclude with that and respond
10 to any follow-ups.

11 **THE CHAIRPERSON:** The consultation that was
12 done by AECL in Quebec, did the CNSC staff attend that
13 consultation?

14 **MR. HOWDEN:** Yes, we did. Mr. David went
15 to Chapeau and we can provide further comments on that, if
16 you wish.

17 **THE CHAIRPERSON:** Yes, I would like a
18 little bit more detail with regard -- and perhaps -- it
19 was AECL who did the consultation; they may wish to
20 comment, if I am correct, in that they ran the
21 consultation in Chapeau.

22 Particularly, from my past experience,
23 there is a number of small communities there and I just
24 wondered if the mayors of all of those small communities
25 had been contacted and if they attended, or if there was

1 sort of a municipal input, as well as actual citizens of
2 those areas who attended that -- I am talking specifically
3 about Chapeau here.

4 **DR. FEHRENBACH:** For the record, this is
5 Paul Fehrenbach.

6 I would like to ask Ms. Donna Roach, our
7 Manager of Community Relations, to respond to the
8 specifics of the Chapeau meeting.

9 **MS. ROACH:** Good morning. For the record,
10 my name is Donna Roach. I am the Manager of Community
11 Relations.

12 Yes, all of the communities in Pontiac
13 County were invited to attend. We advertised in the local
14 papers and we also sent invitations about the -- sorry --
15 we sent letters describing the project to all of the
16 mayors in the communities, inviting them to have a
17 briefing if they so requested. We actually moved the
18 location to Chapeau from previous locations because that
19 came from the communities themselves, saying, "We think
20 that you would get more people coming to your sessions if
21 you were in Chapeau." And we had a very good turnout
22 there.

23 In addition to that, we also received late
24 yesterday -- and I believe that this has been received by
25 CNSC staff as well -- the Mayor of Chapeau, Ile-aux-

1 allumettes, Densyl Spence, is also our community contact
2 with all of the elected officials. And they presented a
3 resolution in favour of the EA approval.

4 **THE CHAIRPERSON:** Thank you.

5 We are going to take a 10-minute break and
6 we will be back. Thank you.

7 --- Upon recessing at 10:30 a.m.

8 --- Upon resuming at 10:42 a.m.

9 **THE CHAIRPERSON:** If you could take your
10 seats, ladies and gentlemen, we are ready to commence.

11 We will now go to round two questioning. I
12 will ask Dr. Barnes if he would like to start.

13 **MEMBER BARNES:** Maybe two or three comments
14 first, based on the line of questioning of others.

15 And again to staff, you were asked to look
16 at the scope and define it, but maybe for my interest,
17 from Figure 5.1 why was the Moly-99 production not
18 included, which I think was the spirit of Mr. Taylor's
19 question but not really answered?

20 **MR. DAVID:** For the record, my name is
21 Claude David.

22 The Moly-99 production facility was not
23 included because it is not required for the NRU Reactor to
24 operate.

25 **MEMBER BARNES:** Okay. Then I'll make a

1 comment on the -- if you allow me, Madam Chair -- on the
2 fish.

3 Just an observation, because obviously the
4 inlet is required to allow the NRU to exist, to operate,
5 and it seemed to me that the line of questioning was going
6 slightly askew there. It seems to me that it really is
7 AECL's responsibility, not the lines of questions that I
8 think went to staff who were trying to document this, or
9 the fact that DFO may not have been aware of it. It seems
10 to me that AECL is operating a facility. It's taking in
11 water. It's emitting water, which has a thermal pulse to
12 it. Both of those activities impinge on the biological
13 aspects of the Ottawa River and it's the responsibility of
14 the licensee to make sure that there is no undue effects
15 on the life within the regulations, both of our Act as
16 well as those of other bodies, in this case obviously
17 Fisheries and Oceans Canada.

18 We deal with these fish issues, I think, on
19 most nuclear power plants that come up. So it's no
20 surprise to AECL. So I was a bit surprised that AECL
21 appeared to be looking for exemption as opposed to fixing
22 the problem, which was to address the screens.

23 I know you are going to look at the screens
24 and that's part of the Follow-up Program, but it did seem
25 to me that the responsibility lay with AECL to be aware of

1 Fisheries and Oceans Canada rules and regulations.

2 **DR. FEHRENBACH:** If I may just respond to
3 that. I realize it wasn't quite a question, but
4 nonetheless you raised some interesting observations.

5 First of all, I would like to point out
6 that when we became first aware of the magnitude of the
7 fish impingement as a result of our Ecological Effects
8 Review, which was done by a consultant for us, the
9 conclusion of that review by the consultant was that it
10 was not a significant impact. So it did not seem to us,
11 at that time in 2002, to be an issue that warranted urgent
12 attention.

13 More recently, in fact quite recently,
14 within the last six months, we have become aware that
15 Department of Fisheries and Oceans has a guideline; not a
16 regulation in this case but a guideline, which we intend
17 to honour now that we are aware of it, and we are in
18 discussion with the Department of Fisheries and Oceans as
19 to how that might be achieved.

20 We would prefer to be able to put in place
21 a situation like a screen which stops the issue, and that
22 is the focus of the engineering assessment. It is not
23 just a study to look at the situation. We are actually
24 doing an engineering assessment, getting down into the
25 specifics of the mesh size, how the screen would be

1 emplaced without impairing the operation of the reactor.
2 So it is more than a study. It is a serious engineering
3 assessment and that would be our preferred solution and
4 the one which we would intend to implement as a follow-on
5 to this Environmental Assessment Report.

6 I would also like to, without minimizing
7 the issue at all, put it into a little bit of perspective
8 for us. The 9,000 fish a year of the type that we are
9 noticing represents a small ice cream container a day or
10 less, and it's about 25 or two dozen minnows a day, which
11 is about what the average fisherman goes through an
12 average afternoon fishing in the Ottawa River.

13 So when you compare that with the magnitude
14 of the benefits of operating NRU and the 34,000 people a
15 day that receive direct health benefits from the
16 radioisotopes, it didn't seem to us in that balance also
17 to be an urgent issue.

18 Nonetheless, I don't want to minimize the
19 fact that there are Department of Fisheries and Oceans
20 Guidelines which we are now aware of and which we intend
21 to honour.

22 **MEMBER BARNES:** Thanks. I think you raise
23 the issue which we face in trying to read these documents
24 and I'm sure are a challenge for the staff in just how
25 much information is needed for this process, because there

1 is no indication of size of fish, right, and so on and so
2 on. So I'll leave the fish alone.

3 But I'll make another comment, if I may,
4 and that is just again one of Mr. Taylor's points, I
5 think, was the Plant Life Management Program. If we are
6 looking at a major plant and this is a screen review for
7 environmental assessment for a plant that might, for
8 example, only have seven years life left, that's one
9 thing, but if it's -- I'll take Mr. Van Adel's speculation
10 that it might go on for another 30 years -- then I think
11 we are here looking at issues here that really should be
12 looked at in a much longer term for a particular activity,
13 a freeze-frame at the moment and so on.

14 But I was surprised at how little
15 information was given on 7.7 on page 34 under Plant Life
16 Management Program.

17 Let me turn just to a few more questions of
18 ---

19 **DR. FEHRENBACH:** Could we respond just to
20 clarify?

21 **MEMBER BARNES:** Of course.

22 **DR. FEHRENBACH:** The comments by Mr. Van
23 Adel were referring to the question about the longer-term
24 future, and this is happening in parallel with what we are
25 here discussing today.

1 Today we are focussed on the environmental
2 impact of operating NRU for a period between now and about
3 2012; not the longer term future. And in that regard we
4 do have now an Aging Management Program, if you prefer to
5 call it that, which is fairly robust, and we can describe
6 that in more detail if you like.

7 But if we come back for the longer term
8 operation or refurbishment of NRU, that is a different
9 situation and there will be a much more significant
10 refurbishment. There will be an analysis of that. It
11 will be a very significantly different situation. But
12 even for the interim we are putting in place a more robust
13 Life Management Program to ensure -- the basic purpose of
14 this is to ensure that every system in NRU is fit for
15 purpose and remains fit for purpose over the operating
16 lifetime that we envisage between now and 2012.

17 **MEMBER BARNES:** I just want to conclude
18 with three quick, short questions.

19 On page 80 on Table 8.15 you list the
20 Ottawa River water quality for annual average radionuclide
21 concentrations between 1998 and 2003 from the various
22 sites down the river, and they are essentially the same
23 listings of Tritium gross, beta-gross alpha or total
24 Strontium and Cesium-137, but in the middle of the diagram
25 for the CRL downstream, Cesium-137 is not listed. I

1 wonder why that would be?

2 That's the third one up from the bottom.
3 Your 28 kilometres downstream, 18 kilometres working up,
4 and then the CRL downstream. And in contrast to all the
5 other categories Cesium-137 as well as total Strontium is
6 missing, but I was more interested in the Cesium value.
7 Is there a reason?

8 **MR. HOWDEN:** Barclay Howden responding.

9 I think that is an oversight on our part
10 and it should have been in there. I'm not sure if we have
11 the information available to provide to you but we did
12 assess the information.

13 **MEMBER BARNES:** Do you recall in the
14 assessment whether there were any surprises or any
15 anomalous values, and values of significance here?

16 **DR. THOMPSON:** Patsy Thompson, for the
17 record.

18 The data is from the AECL Annual Reports,
19 and those reports are reviewed for compliance by staff and
20 we have not, over the past years, noted increasing trends
21 that would be of concern, and my expectation, although we
22 don't have the data this morning, is that there is no
23 inconsistency in terms of the trends at Pointe au Baptême,
24 which is the station that is missing the Cesium data.

25 **MEMBER BARNES:** Okay. If I could turn to

1 page 92 and running onto 93, these are the non-
2 radiological -- the normal operation surface water and
3 sediments under non-radiological and it refers to -- I am
4 just reading at the top of page 93 and it is also
5 commented on, if I recall, in Environment Canada's
6 response:

7 "It is not possible to evaluate
8 whether cadmium and selenium levels
9 exceed the CCME guideline values for
10 drinking water and protection of
11 aquatic life since analytical
12 detection limits used by AECL-CRL are
13 greater than CCME guideline values."

14 Environment Canada suggests and I think you
15 have adopted this in the follow-up is that you will modify
16 the analytical techniques there to allow you to better
17 measure cadmium and selenium levels, but it raises the
18 question in my mind when you are doing these values, why
19 are you using analyses that in fact are not providing you
20 with this information?

21 So maybe it is a question to staff; why has
22 -- well, it could be to AECL first and then to staff.
23 AECL, why are you using techniques that do not allow you
24 to detect these, and to staff, why is this happening?

25 **THE CHAIRPERSON:** So we will start with

1 AECL, please.

2 **DR. FEHRENBACH:** For the record, Paul
3 Fehrenbach speaking.

4 I will take that question under advisement
5 for the moment. I don't have an answer immediately
6 available.

7 **MEMBER BARNES:** Okay. It is also referred
8 to in EC-9 of the Disposition of Comments from Environment
9 Canada.

10 **THE CHAIRPERSON:** Perhaps we could move to
11 staff then, Dr. Barnes?

12 **MEMBER BARNES:** Yes.

13 **THE CHAIRPERSON:** Is there any comments
14 from the staff?

15 **MEMBER BARNES:** The conclusion was that
16 therefore, EC recommends that the proponent lower the
17 detection limits for those cadmium and selenium for future
18 monitoring.

19 **DR. THOMPSON:** Patsy Thompson, for the
20 record.

21 This is an issue that staff dealt with
22 under our Compliance Program. In reviewing the
23 environmental effects review documents from AECL, we
24 requested that this issue be addressed in future
25 monitoring.

1 **MEMBER BARNES:** May I just -- forgive me.
2 Out of interest, it comes back to the cooling water
3 intake. I am looking at page 96, the second paragraph. I
4 will read it:

5 "Cooling water for the NRU is taken
6 from 24 metres below the river
7 surface."

8 Going on:

9 "The water temperature of the intake
10 ranges from a low of 1 degree C in
11 January to a high of 20 degrees C in
12 September."

13 Are you really taking in 20 degrees C from
14 24 metres in the Ottawa River?

15 **DR. FEHRENBACH:** For the record, Paul
16 Fehrenbach.

17 I would like to ask Bill Shorter, the
18 Manager of the NRU, to respond to that question, please.

19 **MR. SHORTER:** For the record, this is Bill
20 Shorter.

21 I can confirm that our inlet water
22 temperatures approach 20 degrees in September.

23 **MEMBER BARNES:** Good. It wasn't that when
24 I swam there.

25 I wonder if I could just ask one more

1 question and that is at Table 9.3, which I'm going to have
2 to start with finding where it is. It is on page 130 and
3 these are the "Hazard quotients for significant exposures
4 to hazardous substances in the Ottawa River" and you will
5 see there under the "Offshore zone process sewer" under
6 the column "Max", both of those are in bold and
7 underneath, it says "Bold values indicate both benchmark
8 and background exposure levels are exceeded".

9 Would AECL like to indicate really what
10 these values mean and the significance of that exceedance
11 in all those components?

12 For example, in Table 9.4, most of the --
13 if you look at the last few words, "Therefore, all HQs are
14 less than 1", but in 9.3, most of them are substantially
15 above 1, right up to 6.3.

16 **DR. FEHRENBACH:** For the record, Paul
17 Fehrenbach.

18 I would like to ask Ray Lambert to respond
19 to that, please.

20 **MR. LAMBERT:** Thank you. Ray Lambert,
21 Atomic Energy of Canada, for the record.

22 This observation that -- where we have a
23 few incidents where chemical doses were depicted to exceed
24 benchmarks was identified in the Ecological Effects Review
25 and a recommendation was put forward which we are

1 following through on to do baseline further studies to
2 determine the effect of the stress on the biota present.

3 So far, there is no indication. In fact,
4 our data indicates that there has been no impact on the
5 population of species but we are following through on the
6 recommendation of the Ecological Effects Review for
7 further study.

8 The benchmark values I believe were -- as I
9 mentioned, came out of our -- I believe they are the ones
10 that came out of our Ecological Effects Review which are
11 based on internationally accepted values for the
12 particular species identified. Exceeding a benchmark is
13 an indication that we should do more follow-up work which
14 we are doing.

15 **MEMBER BARNES:** I wonder if staff, Dr.
16 Thompson, might interpret those numbers for me in terms of
17 the magic word "significance" particularly on the animals
18 listed there.

19 **DR. THOMPSON:** Patsy Thompson, for the
20 record.

21 The conclusions from the assessment
22 essentially indicate that the risk quotients that are
23 bolded are above 1 and would be an indication that an
24 effect is expected. In terms of the significance, because
25 the spatial extent of the potential effects is very

1 limited, it was concluded not to be significant. If you
2 would like more detail, I would ask Glenn Bird to provide
3 more details if you would like.

4 **MEMBER BARNES:** I guess what I am getting
5 at is that in Table 9.1, which lists the potential
6 interactions of continuous operation of the NRU Reactor on
7 the environment, there was a remark about consistency with
8 every aspect looked at ended with "No Significant
9 Measurable Effect", right, without -- for all of them.
10 And yet, when I look at Table 9.3, that doesn't seem to
11 speak in those words but it comes back to (a) measurable
12 and (b) significant, and since these words are never
13 really defined in here, I was trying to look for some more
14 clear statement at this meeting.

15 **MR. BIRD:** Glenn Bird, for the record.

16 In Table 9.3, the numbers in bold, as Patsy
17 pointed to you, are the risk quotients or hazard quotients
18 greater than 1. Those hazard quotients are simply the
19 measured concentration of the contaminants in the sediment
20 divided by the benchmark. The benchmarks are Canadian
21 Council of Ministers of the Environment 1999 data for
22 sediment guidelines. A value of greater than 1 doesn't
23 mean there is an effect. It just shows there is a
24 potential for them.

25 In the column to the right, you can see the

1 hazard quotients for background. Many of the background
2 quotients are greater than 1 and 2. I would also like to
3 point out at this time for benthic invertebrates, the two
4 copper values, 13 and 12, should actually be 1.3 and 1.2
5 and that the benthos benchmark values that were used are
6 given at Table 4.2. So it is dividing the concentration
7 measured in the sediments by those benchmarks which were
8 not derived from toxicity tests.

9 **MEMBER BARNES:** Let me try this once more
10 and it's probably because I don't necessarily fully
11 understand this. You are telling me on the one hand there
12 is no significant measurable effect in Table 9.1, which
13 includes the things we are discussing here under this
14 Table 9.3, at least for hazardous substances in the Ottawa
15 River. And in every case there, every case under the HQ
16 for the background, it is above 1, all right? So as the
17 footnote indicates, the background is -- exposure levels
18 have been exceeded and then under the "Max", the bolded
19 numbers, they are all, many of them, significantly above
20 it, right up to 6.3.

21 I am trying to find out what is the real
22 significance of those numbers for those animals,
23 vertebrates and invertebrates that are listed there?

24 **DR. THOMPSON:** Patsy Thompson, for the
25 record.

1 Just in terms of clarification of the
2 measurable effect in comparison to a significant
3 measurable effect, a measurable effect would be one where
4 if the operation of the NRU in this case and ancillary
5 facilities would result in changes in water or sediment
6 quality that are measurable. This would be a measurable
7 effect.

8 Then, the next step is to say, well, there
9 is a measurable effect. Is this effect significant? That
10 is where we have used the hazard quotients to try to
11 understand the significance, the potential significance of
12 that measurable effect.

13 For the hazard quotients that you are
14 referring to, they are based on sediment quality
15 guidelines as Glenn Bird just mentioned. The guidelines
16 are based on a probability of effect. They are usually
17 conservative and because they are also very spatially
18 limited, although the hazard quotient is above one (1),
19 the spatial significance -- the spatially limited impact
20 makes it not significant. It is measurable but it is not
21 significant.

22 **MEMBER BARNES:** Surely, that is your
23 interpretation, which of course it is, but here we are
24 looking at the process that is feeding the exit water out
25 into the Ottawa River. There is a zone. You would say it

1 is limited but, nevertheless, I think -- I forget the
2 number now, but it is certainly a few hectares in which
3 when the sediments have been analyzed have increased
4 values of various substances; right? Here we are looking
5 at the values both for the background and the hazard
6 quotient for a number of organisms that live within that
7 area. So I would challenge that we are not necessarily
8 looking at a very tiny area. We are looking at an area
9 where this material flows out. I would rather see that
10 admitted rather than in Table 9.1 continually indicating
11 that there is no measurable significant effect. It seems
12 to me what you have shown here is that there is an effect
13 that is both measurable and it is significant within the
14 area of concentration from the process sewer.

15 The issue is, is it so significant that
16 AECL needs to do something about it? Maybe that is what
17 you mean by significance. Then I would ask is it possible
18 to do something about it? But those questions aren't
19 addressed, I think.

20 **DR. THOMPSON:** Patsy Thompson, for the
21 record.

22 Maybe two elements, to answer your
23 question. The first is the staff's determination of
24 significance is based on guidance provided by the Canadian
25 Environmental Assessment Agency in terms of interpreting

1 significance in relation to the *Canadian Environmental*
2 *Assessment Act*. There the interpretation is in terms of
3 are there likely to be significant impacts at the
4 population level? This is done essentially by looking at
5 the spatial extent, the likelihood and the temporal -- the
6 period during which the impact may last.

7 So this is the basis on which staff has
8 made its conclusion of significance. In terms of the
9 spatial extent and the likely significance of this for
10 populations of organisms the conclusion is not
11 significant.

12 You also should know that in Table 9.3 the
13 bolded hazard quotients are for the maximum
14 concentrations, not for the mean which there again limits
15 the spatial extent.

16 The second element to the issue is the
17 hazard quotients that are bolded are very similar to those
18 that are noted in background areas in the Ottawa River
19 where impacts on Benthic Invertebrates are not seen. So
20 although there is a measurable impact from the releases of
21 chemicals from the process sewer they are not out of line
22 with what is seen in background locations in the Ottawa
23 River.

24 A third element is the conclusion that
25 staff has reached in terms of significance of sediment

1 contamination in that area affected by the process sewer
2 is the fact that sediment samples were taken and bio
3 essays, toxicity bio essays were conducted on those
4 sediments in the lab. The results of those bio essays
5 show that the sediment is not toxic to Benthic
6 Invertebrates.

7 So those are the lines of evidence we have
8 used to draw the conclusion.

9 **THE CHAIRPERSON:** Are there further follow-
10 up questions? Dr. Dosman, do you have any follow up?

11 **MEMBER DOSMAN:** Madam Chair, just briefly,
12 I am just trying to fully understand Table 8.7 regarding
13 the lost time injuries. Table 8.7 on staff document --
14 perhaps staff would like to comment initially -- refers to
15 overall performance at the CRL site and I wonder whether
16 there is any information at the NRU facility for lost time
17 injuries?

18 **THE CHAIRPERSON:** Perhaps that would be
19 appropriately handled by AECL since this is their data and
20 then we can go to CNSC staff?

21 **MEMBER DOSMAN:** Well, thank you, Madam
22 Chair. That is perfectly fine.

23 **DR. FEHRENBACH:** We don't have the details
24 of data with us, but I would ask Bill Shorter to do the
25 best he can in providing the distinction between the Chalk

1 River site data and NRU staff data.

2 **MR. SHORTER:** For the record, this is Bill
3 Shorter.

4 Yes, the lost time injuries are tracked by
5 facility. They are reported in our annual safety report
6 that comes to staff. From my memory, unfortunately today
7 our typical values would be in the neighbourhood of two to
8 three lost time injuries per year, typically in the terms
9 of a strain-type injury. No significant injuries in my
10 recent memory, with respect to the facility, and that
11 would include all the people that work in the facilities,
12 not just the operating crew but the maintainers, the
13 tradesmen and the support staff.

14 **DR. FEHRENBACH:** Just for clarification,
15 what Bill just quoted is the number of lost time injuries
16 per year. What is in this table is a number of lost time
17 injuries, I believe, for 200,000 hours, which is the
18 standard norm, industry norm for reporting it. So Bill's
19 two to three would be much less than the 1.8 shown in the
20 table here.

21 **MEMBER DOSMAN:** Right. Well, thank you,
22 Mr. Fehrenbach. I appreciate that clarification.

23 In addition, I would just like to ask AECL
24 the comparison to U.S. National Safety Council's
25 statistics, correct me if I am wrong, do you know if those

1 are comparing to workers of similar type or is that the
2 broad range of U.S. workers which would include quite
3 dangerous occupations like construction, farming and so
4 on?

5 **DR. FEHRENBACH:** Paul Fehrenbach, for the
6 record.

7 I am not familiar with the makeup of what
8 is being compared here. Usually, we compare our
9 statistics to Canadian utility data, which was more akin
10 to the kind of work we are doing and also to the chemical
11 industry which is also similar to a large fraction of the
12 work we do at the Chalk River site.

13 In general, we tend to trend below the
14 chemical industry in terms of frequency of lost time
15 accidents. The data for the power reactor industry in
16 Canada is a little more varied. We are above some, below
17 some. Also, the direct comparison is a little tricky
18 sometimes because of the different definitions we tend to
19 use from one facility to another.

20 **MEMBER DOSMAN:** I am just trying to
21 interpret the data.

22 **THE CHAIRPERSON:** Well, perhaps, Dr.
23 Dosman, though I think we have got to put this in the
24 perspective of the EA. I think, if you see the definition
25 of the EA it is talking about the issue of projected

1 accidents for the continuations of facility. So perhaps
2 it is not so much -- if I could just frame it in the case
3 of in order for us to make a determination on the EA what
4 is the information that is given to us and is there any
5 lack of clarity in terms of a forecast as to whether this
6 facility could be continued? Perhaps that would be
7 helpful for you, and perhaps CNSC staff wish to comment?

8 **MEMBER DOSMAN:** Thank you for framing the
9 question in that manner, Madam Chair.

10 **MR. HOWDEN:** Thank you. Barclay Howden
11 speaking.

12 In terms of these types of events, we look
13 at the individual events as they might impact on the safe
14 operation of the facility, as Madam Keen has said, to be
15 able to determine whether our bounding accidents are still
16 bounding. We are satisfied that the information we have
17 is that the bounding accidents are there.

18 Just in terms of other issues, the lost
19 time injuries are dealt with by Human Resources
20 Development Canada and we liaise with them on the
21 regulatory issues which would be discussed under a
22 licensing hearing with you. But we are satisfied that
23 this is not impacting the environment.

24 **MEMBER DOSMAN:** Thank you, Mr. Howden.

25 **THE CHAIRPERSON:** Dr. McDill.

1 **MEMBER McDILL:** Thank you. All the way
2 back to where I started this morning with the units for
3 surface run-off.

4 If I could ask staff and the AECL with
5 respect to Figures 8.3, which is the surface run-off,
6 water run-off and drainage figure, Figure 8.6, which is
7 the monitoring figure, and Table 8.1, which is the summary
8 of the drainage basin areas. I will give you a second to
9 pull it all together.

10 So it is Table 8.1, Figure 8.3 and Figure
11 8.6. Everybody has got their post-it notes?

12 Once you gave me the units, I was able to
13 start putting this together. I was able to find the arrow
14 for Perch Lake, sort of bottom right-hand corner of 8.3.
15 I think that is the 1.8 times 10 to 6. I was able to find
16 Maskinonge Lake. Balmer Bay is way up at the top but
17 there is no surface water star on 8.6 and I am not sure if
18 there should be, but I think that is up there.

19 But Pumphouse Creek I have not been able to
20 find and I am wondering if someone could tell me where it
21 is because the surface run-off is the largest of all the
22 numbers.

23 **THE CHAIRPERSON:** Perhaps that is an
24 appropriate question for AECL.

25 **DR. FEHRENBACH:** Yes, it is an appropriate

1 question for AECL but I am afraid we don't have someone
2 right here who knows exactly where Pumphouse Creek is.

3 **MEMBER McDILL:** Okay.

4 Toussaint Lake and the Ottawa River --
5 Toussaint Lake I found. The Ottawa River number 1.9, I
6 guess, is up at the top. There is a 1.9 up at the top
7 pointing directly to the Ottawa River. So I am assuming
8 that is where that 1.9 is.

9 My question is -- not my question, my
10 statement is, as we go into the interveners' questions
11 this afternoon, I think it would helpful if we knew in
12 terms of 8.6, Figure 8.6, in very rough terms following up
13 to Dr. Barnes' question, the tritium plumes are where on
14 this map in general terms? Obviously, there is a bunch
15 down by CRL but maybe you could be just a little bit ---

16 **THE CHAIRPERSON:** I think it would be
17 appropriate if they answered now, if AECL answered now.

18 **DR. FEHRENBACH:** In Figure 8.6, the tritium
19 air is shown in the green boxes, but in general, the plume
20 we were discussing this morning is also associated with
21 the area of the little green boxes sort of in the middle
22 of the little red area labelled "CRL".

23 **MEMBER McDILL:** Thank you. So all of the
24 monitoring wells are down in that circle. I guess it is -
25 --

1 **DR. FEHRENBACH:** Well, the ones that we
2 were discussing this morning. There are three other
3 plumes that we are treating which are out in the waste
4 management areas.

5 **MEMBER McDILL:** Okay. That is way out on
6 the left?

7 **DR. FEHRENBACH:** That is right.

8 **MEMBER McDILL:** Maybe sometime I will find
9 out where Pumphouse Creek is. I was just trying to put it
10 all in context to this map so I knew where everything was.
11 Thank you.

12 **THE CHAIRPERSON:** Mr. Graham, do you have a
13 question? And then I'll ask Mr. Taylor after that.

14 **MEMBER GRAHAM:** I just have one more
15 question with regard to Table 8.15, Ottawa River water
16 quality for annual average.

17 There is a large jump below just downstream
18 from the CRL downstream in tritium from an average of 4,
19 4.29 to 3.16. That is the five-year average I am looking
20 at and my question to CNSC staff is, even with that high
21 jump and because the remarks on the very next page are
22 that it can be up to size 7,000 becquerels per litre, that
23 it is safe for drinking water.

24 Is that large increase significant enough
25 for concern to health in the Ottawa River for drinking

1 water, because I presume the Ottawa River does produce
2 drinking water downstream for various communities?

3 **DR. THOMPSON:** Patsy Thompson, for the
4 record.

5 The concentration of 316 becquerels per
6 litre, the five-year average that you refer to, is not
7 unexpected from the operation of the CRL site and it is
8 not a concern for human health. It is well below the
9 drinking water guideline as you mentioned and well below
10 levels that would be a concern for human health or for the
11 non-human biota.

12 There are monitoring activities going in
13 drinking water sources downstream of Chalk River and the
14 levels of tritium have always been well below drinking
15 water guidelines.

16 **MEMBER GRAHAM:** And can one presume that
17 the further down river you go, 18 kilometres to 28
18 kilometres as it reduces is because of dispersement and so
19 on?

20 My other question is the source of the
21 tritium and there are various places. There is the plume
22 and so on, that it may be coming from the plume as it
23 progresses. Can CNSC confirm to me that the monitoring,
24 that there are significant -- are there enough monitoring
25 wells to monitor the flow of the plume toward the Ottawa

1 River that we are satisfied that we have enough monitoring
2 areas?

3 **DR. THOMPSON:** Patsy Thompson, for the
4 record.

5 The measurements of tritium downstream of
6 Chalk River essentially originate from the process sewer,
7 the plumes that we were discussing earlier this morning,
8 as well as Perch Creek. Those are the three main sources,
9 with the process sewer and Perch Creek being the most
10 important.

11 There are enough monitoring wells to
12 monitor the actual groundwater plumes and there is
13 sufficient monitoring in the river to track any trends for
14 tritium and provide us information which we could take
15 action if needed.

16 **THE CHAIRPERSON:** Thank you.

17 That ends then the first round of
18 questions. We are going to now move to the interventions.

19 Before we start, I would note that we've
20 already read the more detailed written submissions from
21 the intervenors and these more detailed written
22 submissions will also be dully considered.

23 We have allocated approximately 10 minutes
24 for the oral presentations. I'd like to now move to the
25 oral presentation by Concerned Citizens of Renfrew

1 Country. This is outlined in CMD 05-H12.2 and we have Mr.
2 Hendrickson with us again.

3 Welcome, Mr. Hendrickson, and the floor is
4 yours, sir.

5 **05-H12.2**

6 **Oral presentation by**

7 **Concerned Citizens of Renfrew County**

8 **MR. HENDRICKSON:** Thank you, Madam Chair
9 and Commissioners for an opportunity to present. My name
10 is Ole Hendrickson and I am representing Concerned
11 Citizens of Renfrew County today.

12 I just wanted to start out -- there has
13 been some discussion already on the significant
14 development report that will be considered later regarding
15 the radiated fuel rod left without cooling for nearly two
16 minutes and if that illustrates some possible gaps in the
17 safety culture and management oversight.

18 Those kinds of events probably influence
19 the likelihood of future significant environmental effects
20 from operating the NRU Reactor more than probably anything
21 I am going to talk to you about in the next 10 minutes and
22 I am sure that you share our group's concerns about those
23 types of events.

24 I'll try to go quickly through some of my
25 main points. I'll talk briefly about this truncated

1 process in preparing the screening report and some of the
2 concerns we have about that; on the issue of the need for
3 quantitative data on particularly waste associated with
4 the seven-year duration of the project and management of
5 particularly high-level waste; and finally, a few remarks
6 on gaps in the -- what we see as gaps in the Environmental
7 Monitoring Program.

8 So in our view, the screening report did
9 not really address the seven-year timeframe of continued
10 operation until 2012. And this brought up some process
11 concerns about how CNSC staff and AECL may have interacted
12 in the preparation of the report and whether AECL might
13 have actually been pressuring CNSC staff to more or less
14 extend the scope of this project beyond the time, the
15 seven-year timeframe, in noting some of the comments that
16 the period of operation might even extend until 2050.

17 And there were some comments in the -- when
18 I looked at the dispositioning of comments from different
19 people it almost seemed that AECL might have had and
20 advanced look at some of the sections of the actual
21 screening report rather than the guidelines per se.

22 So we do seem to have a situation where
23 CNSC shared early versions of the screening report with
24 AECL and AECL was saying, "Well maybe we can change the
25 screening report so that it might apply for more than the

1 seven-year period." And that triggered some concern in
2 our group and we just thought that there was a need to
3 clarify the timelines and process of some of that
4 interaction between CNSC staff and AECL on this screening
5 report and whether that actually occurred in advance of
6 the finalization of the guidelines.

7 So, you know, we feel that all -- that we,
8 as intervenors, should have as much time as possible to
9 look at this. We also note that, looking at the
10 dispositioning of Health Canada's comments, they suggested
11 that maybe the extension of licensing period might be less
12 than seven years and they were raising concerns about
13 aging management and what we have talked about in terms of
14 plant -- the lifetime of the plant.

15 So I realize that that sort of issue will
16 be addressed in future, during the licensing hearings, but
17 those are concerns that we also share.

18 Then in terms of some of the cumulative
19 effects of this, in conjunction with other operations,
20 when we looked at the guidelines, we stated that we had a
21 special concern associated with the extended operation of
22 the NRU and its continuing use for medical isotope
23 production and the delays in full commissioning of the
24 MAPLE reactors, which are adding pressure to keep using
25 the NRU for Moly-99 and we felt that there should be some

1 kind of analysis of how medical isotope production might
2 interact with some of the other activities of the NRU.

3 We note that Health Canada also said they
4 would appreciate knowing the status of the MAPLE reactors
5 that are meant to replace the aging NRU -- at least for
6 medical isotope. And we just think that there is a big
7 difference between operating a 50-year old reactor on a
8 daily basis for medical isotope production, or operating
9 it for -- largely for research purposes or maybe also for
10 Cobalt 60 -- when there is more opportunity to shut the
11 reactor down for maintenance, and we are concerned about
12 higher accident risks with the ongoing daily operation for
13 medical isotope production and felt that those kinds of
14 risk scenarios might have been addressed in the screening
15 report.

16 Another third of issue around cumulative
17 effects has to do with section 9.6.4, which concluded that
18 cumulative effects from the project in combination with
19 ongoing and future CRL operations and projects are not
20 expected to occur and that the annual emissions will show
21 "no measurable change".

22 Well, we felt that basing that conclusion
23 solely on annual emissions ignores the fact that there is
24 a cumulative effect of the addition intermediate and high-
25 level waste that will be generated as a result of

1 operating the NRU for an additional seven years.

2 And one table which particularly puzzled us
3 was Table 7.2, which indicated that more than 80 per cent
4 of the high-level waste generated at CRL during the 1999
5 to 2003 period came from sources other than the NRU
6 Reactor, if we are interpreting that table correctly.

7 And since we are not aware of any other
8 major operating reactors at CRL, we were wondering, "Well,
9 what is the source of all these high level wastes," if
10 they are truly coming from non-NRU sources. And if some
11 of these might be external to CRL, then the variations in
12 those external sources in combination with what is
13 generated by the NRU could have a significant bearing on
14 cumulative effects.

15 And we noted that the EA Guidelines did
16 call for inventories of nuclear substances and other
17 hazardous materials and the sources and quantities of
18 waste predicted to be generated by the project and also
19 on-site processes for handling those wastes, which becomes
20 relevant, I guess, later today, when you talk about the
21 significant development in terms of managing some of the
22 irradiated fuel rods coming out, the reactor.

23 And we just could not find those kinds of
24 inventories and quantities in the screening report and it
25 just really observes that over the next seven years there

1 will be further waste generated and they will need to be
2 disposed of in the waste management areas. And, at the
3 present rate of waste generation, there is sufficient
4 space in Waste Management Area B tile holes to accommodate
5 these additional waste.

6 Yet, we recall -- and I am sure most are
7 aware -- that some of the tile holes at Waste Management
8 Area B are leaking, or at least admitting water, if not
9 leaking. And placing more waste in those tile holes seems
10 to be a problematic aspect of future operations. We are
11 quite aware that there is a proposed new facility which is
12 currently being assessed under the *Environmental*
13 *Assessment Act*, namely the construction operation of a
14 fuel packaging and storage project, which would take some
15 or perhaps all of the tile hole waste out and put them in
16 a more secure state. And yet the screening report did not
17 describe that particular project in any detail. But it
18 seemed that project would be fairly important in assessing
19 the ability of AECL to manage the cumulative effects
20 associated with the waste that would be generated during
21 the continued operations of the reactor.

22 We felt that the report should provide
23 information about particularly that fuel packaging and
24 storage project so that that would help assess the overall
25 impacts of prolonging the operations.

1 Now, then when we turn to mitigation and
2 follow-up, in section 7.2 of the report, we found a couple
3 of fairly problematic statements, and I will just quote
4 these.

5 One says:

6 "No measurable effects..."

7 -- and that is not even "significant measurable effects,"
8 but the statement is:

9 "No measurable effects are expected to
10 occur as a result of the continued
11 operation of the NRU reactor..."

12 And there has been a fair bit of discussion around that
13 because -- and the other one was:

14 "As a result of the assessment of this
15 project it is determined that no
16 additional mitigation measures are
17 required above and beyond the
18 environmental protection programs
19 which have already been implemented."

20 And we do find those problematic in terms
21 of the first statement. I mean, it clearly contradicts --
22 when you say "there are no measurable effects," the data
23 in the screening report show that there are isotope
24 releases via the process sewer. We have been talking
25 about them. There is Argon-41 and C-14 coming from the

1 reactor stack. There are wastes being generated and
2 stored in waste management areas. There are releases of
3 heavy metals and persistent organic compounds as well.
4 And all these things are measurable and -- or should be
5 measured, in fact.

6 And the second statement that:

7 "As a result of the assessment it is
8 determined that no additional mitigation
9 measures are required above and beyond
10 current environmental protection
11 programs."

12 Well, we do not feel that the screening
13 report itself really assessed the current environmental
14 protection programs at CRL. Our understanding is that is
15 basically done as part of the licensing hearing.

16 So that kind of determination does not seem
17 to flow from the scope of the work that was done in the
18 screening report. And so we are not sure that a
19 conclusion that "no mitigation measures are required above
20 and beyond existing environmental protection programs" is
21 appropriate and can be supported by the evidence provided
22 in the screening report.

23 When we look at the kinds of issues
24 identified for the Follow-Up Program, and this has all
25 been discussed quite a bit already this morning, there is

1 the size of the screen or the existence of a screen at the
2 cooling water intake and the fish impingement issues, the
3 source of the leaks that are potentially linked to the NRU
4 Reactor operations we have heard that may be those now
5 that -- that the thought is those may have been associated
6 with the old active drain system which has been removed,
7 and thanks to the Commissioners for delving into that.
8 And three issues that might require additional monitoring,
9 having to do with some of the heavy metals, I guess, that
10 might be released or might not be released because the
11 detection limits are actually higher than some of the
12 concentrations that might be of concern, that the studies
13 -- to be better define that the plume associated with the
14 process sewer in the sediments that are contaminated and
15 the release of chlorine which is, I guess, added to the
16 pipes to clean them out periodically.

17 Now, this is a fairly diverse set of issues
18 that could be addressed in the Follow-Up Program and it
19 does lead us to wonder, you know, what if we really did
20 have a thorough review of the Environmental Protection
21 Program? Because this issues such as fish entrainment and
22 leaks from the NRU Reactor, possibly problematic heavy
23 metal and chlorine discharges, the unknown extent of the
24 plume from the process sewer are all, in our view,
25 potentially significant environmental effects. And while

1 it is important they have been identified in the screening
2 report, we do think that there might be a need for a more
3 sort of comprehensive Follow-Up Program.

4 For example, just on the fish issue, we
5 were looking at some of the dispositioning of comments
6 from Environment Canada which noted that the most recent
7 fish population studies were done in 1980 and Environment
8 Canada recommended that AECL conduct a new fish survey as
9 part of the Follow-Up Program.

10 The CNSC staff response was that a new fish
11 survey is not required as the project does not have an
12 adverse effect on fish, and they went on to say releases
13 from the NRU have no effect on fish.

14 Well, the discussion we have had today
15 shows that just can't be supported. There are impacts on
16 fish clearly from impingement in the water intake and
17 potential impacts also from the contaminants that are
18 being released from the process sewer in other sources of
19 release of radionuclides and other substances.

20 Our group has been, for some time, critical
21 of some of the gaps in AECL's monitoring program and we
22 would like to see credible, long-term data sets; for
23 example, Cesium-137 levels in fish, and we have often
24 mentioned the Strontium-90 levels in freshwater mussels.

25 We feel that monitoring really is the

1 single most important mitigation measure that can be
2 included in a follow-up program. It's the only real way
3 you can validate environmental protection regimes, and we
4 note that emission levels are largely based on human doses
5 and not on effects on biota.

6 So we were hoping that given our historic
7 lack of success in getting what we think is a satisfactory
8 resolution of some of these environmental monitoring
9 issues through the licensing process, that maybe this
10 environmental assessment process and the follow-up
11 associated with it might be a good mechanism for designing
12 and implementing perhaps a more comprehensive
13 environmental monitoring program for CRL.

14 And really, as people have said today, the
15 NRU is the heart of CRL operations and if a review of gaps
16 in the monitoring program and development of a
17 comprehensive monitoring program are not initiated as a
18 follow-up environmental assessment measure here, we feel
19 that yet another opportunity will have been missed to fill
20 what we find are some significant gaps in the
21 environmental protection regime.

22 Thank you.

23 **THE CHAIRPERSON:** Thank you very much.

24 Are there questions from Commission members
25 with regards to this intervention?

1 Dr. Dosman.

2 **MEMBER DOSMAN:** Madam Chair, I would just
3 like to ask if AECL would be willing to respond to the
4 statement on page -- what would be page 7. It's the
5 second-last page:

6 "Our group has long been critical of
7 the gaps and absence of transparency
8 in AECL's Environmental Monitoring
9 Program."

10 I'm just wondering if AECL would be willing
11 to comment?

12 **DR. FEHRENBACH:** For the record, it's Paul
13 Fehrenbach speaking.

14 Let me discuss the transparency issue
15 first. I don't think there is an issue, actually. We
16 have something like 30,000 monitoring results a year from
17 locations which extend upriver and downriver of our site,
18 as well as significant monitoring points on the site.
19 This information is assessed and collected annually into
20 summary reports with some fair level of detail in them,
21 and those reports are made publicly available. In fact,
22 they are on our website, and if I am not mistaken, copies
23 have been sent to Mr. Hendrickson and the Concerned
24 Citizens of Renfrew County.

25 So in terms of transparency, I really can't

1 agree that there is an issue. Everything that we have is
2 made public in terms of our monitoring program and it's
3 quite extensive.

4 We are always willing to discuss the
5 question of sufficiency. We believe we have -- we don't
6 have any significant gaps in our program. We have it
7 independently validated and verified as well. A professor
8 from the University of Laval annually comes and does
9 independent checks and measures and compared his results
10 against our monitoring results, and we make public that
11 comparison as well.

12 I'm a little bit at a loss with respect to
13 allegations of major gaps in the program.

14 And I would like to say with respect to the
15 sediment studies near the process sewer that a couple of
16 the major findings there are worth noting. One is that
17 with respect to heavy metals that have concentrated on the
18 river bottom and are detectable in that location, a coring
19 analysis and historic look at the times at which these
20 materials were laid down shows that the vast majority of
21 the heavy metals in Ottawa River sediments come from
22 mining activities well upstream of the Chalk River area,
23 up in the regions of Tamiscamingue and Northern Ontario
24 and Northern Quebec and that with respect to some of the
25 radionuclides that are found concentrated there and the

1 relatively low concentrations that were discussed earlier
2 this morning, the historic sedimentation rates there have
3 also significantly decreased since the NRX Reactor was
4 shut down. So the NRU is having a relatively minor
5 ongoing impact in terms of additional sediments in the
6 river bottom.

7 **MEMBER DOSMAN:** Madam Chairman, if I might
8 ask CNSC staff if you might be willing to comment
9 specifically on the intervenor's comments on Cesium-137
10 levels in fish or Strontium-90 levels in freshwater
11 mussels in the context of long-term monitoring?

12 **DR. THOMPSON:** Patsy Thompson, for the
13 record.

14 The Environmental Monitoring Program that
15 AECL has in place to meet the licence requirements of the
16 CNSC have been designed based on emissions to the
17 environment, the pathways, the means by which the
18 contaminants release from the site, find their way into
19 the environment and may expose people or non-human
20 species.

21 The program AECL has in place is a
22 regulatory compliance program and, as such, meets the
23 requirements of the CNSC.

24 We have audited the program implementation
25 in the past. We review the data annually and are

1 satisfied that what is currently being done by AECL meets
2 the requirements.

3 The CNSC staff presented, I believe it is
4 in 2003, the risk-based process that staff uses to
5 indicate what level of monitoring is expected from
6 licensees. This is currently being formalized in a
7 regulatory guidance to support a standard being produced
8 by the CNSC. Our understanding currently is that AECL's
9 Monitoring Program would meet the requirements of the
10 standard and the guidelines that will be issued shortly.

11
12 The issue of monitoring for fish or mussel
13 for Strontium and Cesium-137 has been raised in the past
14 and was the basis that the Ontario Ministry of the
15 Environment used to approach Environment Canada in terms
16 of conducting an investigation for potential violation of
17 the *Fisheries Act*.

18 All the work that Environment Canada
19 Investigation Group did on releases from the Chalk River
20 site indicated that although there were measurable
21 releases from the site and measurable values in mussel and
22 fish for example, that this did not constitute a violation
23 of the *Fisheries Act*, and the work we have done and the
24 Environmental Effects Review that AECL has done, indicates
25 that although there are measurable levels these will not

1 pose a risk to biota.

2 So on that basis requiring or requesting
3 that AECL conduct this monitoring would not provide a lot
4 of additional value in terms of potential controls on the
5 operation of the site.

6 There are also, I guess, disadvantages or
7 problems with using mussels as a regular ongoing
8 monitoring tool. It is a tool that is being used for some
9 national programs, for example, in terms of long-term
10 tracking of environmental quality. But in terms of using
11 it as a tool for specific industries, it works well under
12 some water concentrations or water levels and not as well
13 in others. So it has got limitations as well that would
14 need to be considered.

15 But from a compliance point of view, it is
16 staff's opinion that the current program that Chalk River
17 has in place meets our requirements and it will continue
18 to be audited to make sure that it continues to meet our
19 requirements.

20 **MEMBER BARNES:** Thank you.

21 **THE CHAIRPERSON:** Are there any further
22 questions for this intervenor?

23 Mr. Henrickson, one of the questions I have
24 is whether there has been a meeting between any members of
25 your group and AECL with regards to this ongoing

1 Monitoring Program? Has that happened and has CNSC staff
2 attended that meeting?

3 **MR. HENRICKSON:** No, Madam Chair. We
4 haven't specifically met with either the licensee or CNSC
5 staff on the Monitoring Program issue.

6 **THE CHAIRPERSON:** I say that because I am
7 aware that your group has met with CNSC staff on another
8 topic and another licensee, and I just wanted to check
9 with regards to this. As you say, it is a long-term
10 licensee in that area, and that is just a question that I
11 had.

12 Are there any further questions?

13 Thank you very much, sir, for coming today.

14 I would like to then move to the next oral
15 presentation, which will be by teleconference. So I am
16 just checking to make sure that this is CMD 05-H12.7, 05-
17 H12.7A.

18 Mr. William Hendry is with us, I believe,
19 sir, and I believe this is your first time before the
20 Commission. So welcome, sir.

21 **05-H12.7 / 05-H12.7A**

22 **Written Submission from William Hendry**

23 **MR. HENDRY:** Thank you. Can you hear me
24 loud and clear?

25 **THE CHAIRPERSON:** I certainly can, sir.

1 **MR. HENDRY:** I understand the Commission is
2 made up of two ladies and four men?

3 **THE CHAIRPERSON:** Yes, that is right, sir.

4 **MR. HENDRY:** What a good looking and
5 handsome group you are.

6 Too much butter?

7 **THE CHAIRPERSON:** Did you have an
8 intervention, sir?

9 **MR. HENDRY:** A little humour there. I
10 didn't hear any laughing though.

11 **THE CHAIRPERSON:** We are a very serious
12 group, sir ---

13 **MR. HENDRY:** Okay.

14 **THE CHAIRPERSON:** --- for your
15 intervention.

16 **MR. HENDRY:** Okay. If you look at the
17 report in front of you they've made a reference there to
18 "Chapleau", readings in Chapleau. Well, Chapleau is a
19 town in Ontario about 400 miles northwest of Chalk River.
20 What we're actually talking about here is Chapeau, Quebec,
21 C-H-A-P-E-A-U.

22 **THE CHAIRPERSON:** That is correct, sir.

23 **MR. HENDRY:** Now, I received some
24 information just yesterday which for me raised more
25 questions than answers. They indicated that, in fact,

1 there is radioactive material escaping into the air from
2 the operations of the NRU Reactor.

3 So these questions I was hoping to get some
4 answers yesterday from either AECL or CNSC people but
5 nobody was available. I assume they were all sequestered
6 in Ottawa in preparation for today's meeting. So I will
7 get to these people and I will ask these questions, and
8 today I'm going to tell you what my questions are going to
9 be for them, and if I'm not happy with the answers or
10 upset by them I will pass along my comments to you through
11 Secretary Marc Leblanc.

12 Now, what I wanted to know is, with regard
13 to air monitoring, is the monitoring conducted on a 24/7
14 basis or is it just sporadic? And what are the acceptable
15 limits of these fall-outs and what are the actual local
16 measurements? And will the addition of two more reactors
17 triple the amounts of the fall-out and what would the
18 cumulative effect be?

19 Basically that's what I have for you folks
20 and you may have a question for me.

21 **THE CHAIRPERSON:** Well, sir, we certainly
22 are interested in your questions and your ongoing contact
23 with the CNSC staff is totally appropriate. But because
24 you raise these questions why don't we try to see if we
25 can get some answers.

1 Would AECL like to comment to begin with,
2 please?

3 **DR. FEHRENBACH:** Could we clarify which
4 questions we are being asked?

5 **MR. HENDRY:** All right. I can give you my
6 first question, if you like.

7 The monitoring, the air monitoring, is it
8 an annual thing, a semi-annual thing, or is it conducted
9 on a 24/7 basis?

10 **DR. FEHRENBACH:** I will ask our
11 environmental expert Ray Lambert to respond to that.

12 **MR. LAMBERT:** Thank you. For the record,
13 Ray Lambert, AECL.

14 In response to your question, the
15 monitoring off-site is predominantly 24/7 and it consists
16 of different types of monitors. We have TLDs, air
17 monitors, ---

18 **MR. HENDRY:** I can't hear you.

19 **MR. LAMBERT:** I'm sorry. I will speak into
20 the mic.

21 The quick answer to your question is that
22 we monitor airborne activity around our site, in the
23 vicinity of our site, down to Chapeau, Demers Centre, for
24 example, using equipment that is monitoring 24/7. In
25 particular in Demers Centre, and excuse me if I'm

1 pronouncing it wrong, in Chichester we have TLDs, for
2 example, monitoring disposition of radionuclides on a 24/7
3 basis.

4 **THE CHAIRPERSON:** Did you hear the answer,
5 sir?

6 **MR. HENDRY:** Yes, I did.

7 And my next question would be what are the
8 acceptable limits? I mean, give me a number from one to
9 10. What are the acceptable limits of these fallouts and
10 what are your actual readings in comparison to them?

11 **DR. FEHRENBACH:** Paul Fehrenbach, for the
12 record.

13 There is quite a large number of numbers to
14 quote here and I don't think really that gets to the sense
15 of your question. It depends on individual radionuclides
16 and total activities, whether it's air, water, et cetera.

17 But let me say in response to your question
18 that the annual release limits are set based on what the
19 CNSC declares as acceptable doses to the public based on
20 advice from the International Commission on Radiation
21 Protection, and those are then turned into what would be
22 an acceptable release from the site to stay below those
23 numbers. Typically, our releases are running in the area
24 of one per cent or less of these, what we call, derived
25 release limits. So we are well below the acceptable

1 levels which are set essentially by the CNSC.

2 **MR. HENDRY:** Okay. And my next question is
3 what will the addition of two more reactors do to these
4 limits?

5 **DR. FEHRENBACH:** The limits will not
6 change.

7 **MR. HENDRY:** Well, I mean the actual
8 fallout.

9 **DR. FEHRENBACH:** We don't believe the
10 releases will change significantly from the addition of
11 two modern and I assume you are referring here to the
12 MAPLE isotope production reactors?

13 **MR. HENDRY:** Correct.

14 **DR. FEHRENBACH:** Yes. No, in fact, we
15 expect the releases to reduce when we transfer the isotope
16 production to the MAPLE isotope facilities.

17 **MR. HENDRY:** Okay. Finally, what would the
18 cumulative effect be from this fallout over a long period
19 of time, over 10 years or 20 years or 30 years? Have
20 there been any medical studies done along that line?

21 **DR. FEHRENBACH:** Yes, there have been
22 studies. I would like to refer again that question --
23 this is Paul Fehrenbach, for the record. I would like to
24 refer that question to Ray Lambert.

25 **MR. LAMBERT:** Ray Lambert, for the record.

1 As Dr. Fehrenbach mentioned, there has been
2 studies of the radiological impact both on humans and non-
3 humans and these are ongoing studies and there are also
4 our Environmental Monitoring Program aspects where we go
5 and sample vegetation, soil, water, vegetables, fruits,
6 milk to determine whether there is accumulation of
7 nuclides into the levels so that we can compare them
8 against these benchmarks.

9 **MR. HENDRY:** Please, talk up, sir. I can
10 hardly hear you.

11 **MR. LAMBERT:** I am sorry.

12 **MR. HENDRY:** And I am concerned with the
13 air monitoring at this point.

14 **MR. LAMBERT:** The air monitoring, the
15 accumulation that you would be referring to then would be
16 rated nuclide de-positioning from the air into the
17 environment, into the water and vegetables and milk. So
18 part of our monitoring program is we actually take samples
19 of the environment, of vegetables and milk, et cetera, to
20 determine if there is any accumulation of nuclides and we
21 compare them against the models that are used to calculate
22 our releases and compare against deregulatory release
23 limits. We also use them to compare against benchmarks in
24 international studies as to what are acceptable levels of
25 activities in the environment.

1 **MR. HENDRY:** But what my concern is, is the
2 intake of air by people. We have such a high rate of
3 cancer along here, we have whole streets in the city of
4 Chapeau where cancer is prevalent in every house, from
5 children to old people and it is the air intake that they
6 are breathing. This is what I am concerned about and this
7 is the kind of a study I want to know if a cumulative
8 effect over years of exposure to this material could be
9 contributing to this cancer we are having.

10 **DR. FEHRENBACH:** Yes. The last study that
11 was done with respect to that shows there was no
12 measurable effect on cancer rates from the emissions from
13 not only from Chalk River but around any nuclear power
14 plant. The data in Renfrew County with cancer rates, we
15 are advised by the County Health Unit, is more a result of
16 local lifestyle conditions, smoking, diet, exercise, et
17 cetera. We are not aware of any recent studies that would
18 contradict that.

19 **MR. HENDRY:** When was the last study done,
20 do you know?

21 **DR. FEHRENBACH:** I don't have the date of
22 that study currently. I'll see if we can find it. One
23 moment.

24 **(SHORT PAUSE)**

25 **DR. FEHRENBACH:** To the best of our

1 knowledge, the last such study was done in the 1980s.

2 **MR. HENDRY:** Well, ladies and gentlemen of
3 the Commission, I intend to delve into this in a little
4 bit more detail with the people at AECL when they make
5 themselves available to me. And as I said earlier, if I
6 am unhappy with the results I am getting, I will certainly
7 make a report to you through the Secretary, Marc Leblanc,
8 and I thank you for your time today.

9 **THE CHAIRPERSON:** Before you leave, sir, I
10 would like to have the CNSC staff as sort of the
11 independent oversight for AECL to just comment if there is
12 anything they would like to say with regards to your
13 specific questions as to any variations in terms of their
14 information to the information that was given to you by
15 AECL. Those are your independent experts looking at this.

16 So I will ask Mr. Howden to do that.

17 **MR. HOWDEN:** Thank you, Madam Chair.
18 Barclay Howden, for the record.

19 I am going to ask Dr. Patsy Thompson to
20 comment on the concerns of Mr. Hendry with regard to the
21 long-term cumulative effects of the deposition of airborne
22 contaminants into the area of Chapeau.

23 **THE CHAIRPERSON:** And I would like you
24 specifically to comment if there is any variation from
25 your point of view as to the frequency of monitoring, et

1 cetera, that was commented on by AECL. If you have any
2 variations for Mr. Hendry, that would be important too.

3 Dr. Thompson, please?

4 **DR. THOMPSON:** Patsy Thompson, for the
5 record.

6 In terms of the question in terms of will
7 the operation of two new reactors add to the current
8 emissions, the answer is yes, it will add to the current
9 emissions, but not significantly. So the expectation is
10 the current radiation doses that members of the public get
11 from exposure to emissions from Chalk River will not --
12 will increase but very slightly and will remain well, well
13 below levels that are the regulatory limit and levels
14 known to cause potential health effects.

15 The expectation is that there will be no
16 variation in accumulation of radionuclides over time. We
17 have a fairly long history of monitoring in the area and
18 we have not seen in the very areas that are being
19 monitored close to Chapeau and Chichester increased
20 accumulation over time and we expect that this will not
21 change.

22 **THE CHAIRPERSON:** Do you have any comments
23 with regards to the other information that was given by
24 AECL in terms of frequency, the monitoring devices, the
25 monitoring frequency, the nature and frequency of any

1 other historical health studies or anything that you would
2 like to add?

3 **DR. THOMPSON:** In terms of the frequency of
4 the monitoring -- Patsy Thompson, for the record, my
5 apologies. Because the nature of the types of
6 radionuclides that will be released is not going to change
7 with the -- when the MAPLE reactors come online, we don't
8 expect that there will be required changes to the
9 monitoring program in terms of frequency and location. In
10 terms of the health studies, it is our understanding from
11 the staff's epidemiologist that the current information
12 indicates that there is not an increased incidence in
13 cancer in the area.

14 **THE CHAIRPERSON:** Sir, what we will ensure
15 is that the Secretary gives you the information in terms
16 of contact information with the CNSC staff and AECL has
17 also already agreed to supply you with any information.
18 Certainly it is your right as a citizen to have
19 transparency in terms of the information that is available
20 on any licensed property that is under license to the
21 CNSC. So it is my assumption and my direction to the
22 staff that they will give you the information that you
23 seek.

24 And if you wish to intervene before the
25 Commission in any of the hearings that we have, it is

1 certainly your right and the Secretary will put you on the
2 mailing list for those information releases. So I hope
3 that addresses a bit of the questions that you have today
4 and certainly it is your right to ask further questions in
5 the future.

6 **MR. HENDRY:** Well, I appreciate that and
7 maybe just in closing, I will make an observation here
8 that medical tests done 25 years ago, I think with the
9 state of the art today, those tests may prove to be a lot
10 different than the ones they got 25 years ago and I think
11 that is something we are going to have to look into.

12 **THE CHAIRPERSON:** Thank you very much, sir.
13 Are there any other questions from any
14 other Commission Members?

15 Well, thank you very much for your
16 intervention. Thank you very much.

17 We will now then move on to the next
18 submission. It is a written submission from the
19 Corporation of the Town of Laurentian Hills, CMD 05-H12.3.

20 **05-H12.3**

21 **Written submission from the**
22 **Corporation of the Town of Laurentian Hills**

23 **THE CHAIRPERSON:** Are there any questions
24 or comments from Commission members with regards to this
25 CMD?

1 Seeing none, I will move on then to the
2 next written submission. It is a written submission from
3 the County of Renfrew, outlining CMD 05-H12.4.

4 **05-H12.4**

5 **Written submission from the**
6 **County of Renfrew**

7 **THE CHAIRPERSON:** Are there any questions
8 or comments from Commission members with regards to this
9 CMD?

10 Seeing none, I will now move to the next
11 written submission. It is a written submission from the
12 Corporation of the Town of Deep River CMD 05-H12.5.

13 **05-H12.5**

14 **Written submission by**
15 **Corporation of the Town of Deep River**

16 **THE CHAIRPERSON:** Are there any questions
17 or comments with regards to this submission?

18 Seeing none, I will move to the next
19 submission which is a written submission by Cheryl
20 Gallant, M.P. CMD 05-H12.6.

21 **05-H12.6**

22 **Written submission by**
23 **Cheryl Gallant, M.P., Renfrew - Nipissing - Pembroke**

24 **THE CHAIRPERSON:** Are there any questions
25 or comments from Commission members with regards to this

1 CMD?

2 Thank you very much, then. This completes
3 the record for today's hearing.

4 With respect to the matter I propose that
5 the Commission confer with regards to the information we
6 have considered today and we will be determining if
7 further information is needed or if the Commission is
8 ready to proceed with the decision and we will advise
9 accordingly.

10 Yes, Dr. Fehrenbach.

11 **DR. FEHRENBACH:** One point of clarification
12 I could add just before you close, Madam Chair, was the
13 question from Dr. McDill about Pumphouse Creek. If you
14 get out Figure 8.3 I can clarify the situation. We have
15 one of these situations where a creek goes by two
16 different names. On this figure it is known as "Black
17 Duck Creek" and it is in the lower centre of the figure.
18 It drains Black Duck Lake which is in the extreme lower-
19 left corner into a lake somewhere just off the map on the
20 right centre bottom.

21 **THE CHAIRPERSON:** Thank you very much.

22 Because of that I will have to start at the
23 beginning.

24 With respect to this matter, I propose that
25 the Commission confer with regard to the information that

1 was considered today and then determine if further
2 information is needed or if the Commission is ready to
3 proceed with the decision, and we will advise accordingly.

4 We will now take a break and we will be
5 back at 5 after 1:00. Thank you very much.

6 --- Upon recessing at 12:04 p.m.

7