

Canadian Nuclear  
Safety Commission

Commission canadienne de  
sûreté nucléaire

Public meeting

Réunion publique

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Public Hearing Room  
14th floor  
280 Slater Street  
Ottawa, Ontario

Salle des audiences publiques  
14e étage  
280, rue Slater  
Ottawa (Ontario)

Commission Members present

Commissaires présents

Dr. Michael Binder  
Mr. Dan Tolgyesi  
Dr. Sandy McEwan  
Ms Rumina Velshi  
Mr. André Harvey

M. Michael Binder  
M. Dan Tolgyesi  
Dr Sandy McEwan  
Mme Rumina Velshi  
M. André Harvey

Secretary:

Secrétaire:

Mr. Marc Leblanc

M. Marc Leblanc

General Counsel:

Avocate générale :

Ms Lisa Thiele

M<sup>e</sup> Lisa Thiele

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Ottawa, Ontario / Ottawa (Ontario)

--- Upon commencing on Wednesday,  
October 1<sup>st</sup>, 2014 at 1:02 p.m. / L'audience  
début le mercredi 1<sup>er</sup> octobre 2014 à 13 h 02

**CMD 14-M57**

**Opening remarks**

**M. LEBLANC** : Bonjour, Mesdames et Messieurs. Bienvenue à la réunion publique de la Commission canadienne de sûreté nucléaire.

We have simultaneous translation. I would ask that you please keep the pace of speech relatively slow so that the translators have a chance to keep up.

Des appareils de traduction sont disponibles à la réception. La version française est au poste 3 and the English version is on channel 2.

Please identify yourself before speaking so that the transcripts are as complete and clear as possible.

The transcripts will be on the website of the Commission sometime next week.

I would also like to note that

this proceeding is being video webcast live and that archives of these proceedings will be available on our website for a three-month period after the closure of the proceedings.

I would ask that you please silence your cell phones and other electronic devices.

Monsieur Binder, président et premier dirigeant de la Commission, va présider la réunion publique d'aujourd'hui.

President Binder...?

**LE PRÉSIDENT** : Merci, Marc.

Good afternoon and welcome to the meeting of the Canadian Nuclear Safety Commission.

Mon nom est Michael Binder. Je suis le président de la Commission canadienne de sûreté nucléaire.

Je vous souhaite la bienvenue and welcome to all of you joining us via webcast.

I would like to start by introducing the Members of the Commission that are with us here today.

On my right is Monsieur Dan Tolgyesi.

To my left are Dr. Sandy McEwan,

Ms Rumina Velshi and Mr. André Harvey.

We have heard from our Secretary, Marc Leblanc.

We also have Ms Lisa Thiele, General Counsel to the Commission with us here today.

**MR. LEBLANC:** So the *Nuclear Safety and Control Act* authorizes the Commission to hold meetings for the conduct of its business.

Please refer to the updated Agenda published on September 25th for the complete list of items to be presented today.

In addition to the written documents reviewed by the Commission for today's meeting, CNSC staff will have an opportunity to make presentations and Commission Members will be afforded an opportunity to ask questions on the items before us, both to staff and to the industry representatives.

Mr. President...?

**CMD 14-M61.A**

**Adoption of Agenda**

**THE PRESIDENT:** Okay. I would

like to call now for the adoption of the agenda as outlined in Commission Member Document CMD 14-M61.A.

Do we have concurrence? For the record, the agenda is adopted.

**CMD 14-M62**

**Approval of Minutes  
of Commission Meeting held  
August 20 and 21, 2014**

**THE PRESIDENT:** I would now like to call for the approval of the Minutes of the Commission meeting held on August 20 and 21, 2014. The minutes are outlined in Commission Member Document CMD 14-M62.

Any comments, additions, amendments?

Okay. Therefore, for the record, I now -- since we have concurrence the Minutes are now adopted or approved.

**MR. LEBLANC:** Mr. President, before pursuing I just want to verify the technology. So we are having people from the Saskatoon office joining us either by

teleconference or videoconference. Can we verify if they are onside? Thank you.

Can you hear us?

**MS VAN LAMBALGEN:** Yes, we can.

**MR. LEBLANC:** Thank you very much.

And we also have a representative from the industry here in attendance in the room.

Mr. President, the first item on the agenda is the CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities for the year 2013. This is outlined in Commission Member Document CMDs 14-M59 and 14-M59.A.

A separate report will be presented later today on the Uranium Mine and Mills Facilities.

So we will separate those presentations into three question periods; the first one on the Port Hope and the GE Hitachi facilities, the second one on the SRBT and Nordion facilities and the third presentation will be on the Uranium Mines and Mills. Questions will be asked after each of those three presentations.

Mr. President, the floor is yours.

**THE PRESIDENT:** Okay. I'm sure

you all digested this. We will guide you through this. So let's start with the presentation from staff by Mr. Newland.

**MR. NEWLAND:** Good afternoon. I would just like to get clarity on the process by which we present. So you would like us to present in three segments, stop, do the Qs and As, then move on?

**MR. LEBLANC:** That is correct.

**CMD 14-M59 / 14-M59.A**

**Oral presentation by CNSC staff**

**MR. NEWLAND:** Okay. Thank you. I just thought I would check.

Good morning, Mr. President;  
Members of the Commission.

My name is David Newland and I am the Acting Director General of the Directorate of Nuclear Cycle and Facilities Regulation.

With me today is Mr. Michael Rinker, Director of the Nuclear Processing Facilities Division.

We also have licensing and compliance staff, as well as subject matter



experts with us to help answer any questions that the Commission may have.

We are here to present Commission Member Document CMD 14-M59 entitled CNSC Staff Report on the Performance of Uranium and Nuclear Substance Processing Facilities for 2013.

I will now pass the presentation to Mr. Rinker. Thank you.

**MR. RINKER:** Good afternoon, Mr. President and Members of the Commission.

My name is Michael Rinker and I am the Director of the Nuclear Processing Facilities Division.

I will be presenting to you information on the performance of uranium processing facilities and nuclear substance processing facilities.

I will also be updating the Commission on matters of regulatory interest such as an update on the cell room event at the Port Hope Conversion Facility, a status update of the Fukushima Action Plan as it relates to uranium and nuclear processing facilities, the status of the financial guarantee for Best Theratronics, which was recently granted a Class 1B license in June of

2014 and the status of actions that were requested of GE Hitachi Canada by the Commission during the presentation of the 2012 annual report in Toronto in December of last year.

The CNSC regulates Canada's uranium and nuclear processing facilities to protect the health, safety and security of Canadians and the environment. The CNSC achieves this mandate through licensing, reporting, verification and, when necessary, enforcement.

The report provided in CMD 14-M59 and this presentation are organized by industry sector covering uranium processing facilities and nuclear substance processing facilities. The information presented covers the 2013 calendar year and, where appropriate, compares information amongst facilities and to previous years.

Safety performance is continually determined by staff using a risk-informed approach. That is, the compliance program is developed and planned commensurate with the risks associated with the facility, the complexity of the facility and past performance and how well the licensee has managed risks. CNSC also verified compliance through monitoring and desktop reviews

of annual and quarterly compliance reports. The compliance program is supplemented with meetings with licensees to ensure clarity of CNSC expectations.

Finally, safety performance is also determined through inspection. 23 inspections were conducted by the CNSC at uranium and nuclear substance processing facilities. Some inspections focused on specific safety and control areas, while other inspections covered multiple safety and control areas. Nevertheless, the inspectors strive to ensure that aspects of radiation protection, environmental protection and conventional health and safety are covered in every inspection.

The report format is similar to last year's report. The report focuses on the three safety and control areas of radiation protection, environmental protection and conventional health and safety which cover the key performance indicators for the uranium and nuclear processing facilities. The report also includes appendices that provide data to support findings in the report, as well as production data and financial guarantees for each facility.

Also highlighted in the report is a discussion of public information programs, ratings for all 14 safety and control areas, a discussion of reportable events, any significant facility modifications and areas of increased regulatory focus.

The report provides the basis for CNSC staff's conclusion that the uranium and nuclear processing facility industry has performed safely in 2013 and progress has been made in engagement of members of the public.

An introductory section on dose limits, release limits and action levels is presented as part of the 2013 report.

Radiation dose limits put a limit to the dose received to workers and members of the public. Any dose limit exceedance is a violation of the *Radiation Protection Regulations*.

Release limits are used to limit the quantity of nuclear and hazardous substances released into the environment. Exceedance of a release limit is a violation of a license condition which would result in CNSC enforcement action.

In contrast, action levels are a

tool used to ensure that licensees are operating their facility in accordance with their approved programs and within the design and operational parameters of safety control systems. Action levels are set at levels much lower than limits to protect health and the environment. As such, exceeding an action level does not indicate a risk to people nor to the environment. Rather, exceeding an action level draws attention to both the CNSC and to the licensee to a potential problem that must be resolved so that release limits and dose limits are not exceeded.

I will now present CNSC staff's assessment of the performance of uranium processing facilities. Collectively, these facilities refine and convert uranium received from uranium mines and fabricate fuel pellets and fuel bundles for use in nuclear power plants.

There are five uranium processing facilities in Canada. All are located within the province of Ontario. Cameco is the operator of three facilities, the Blind River Refinery, the Port Hope Conversion Facility and the Fuel Manufacturing Facility.

The fuel fabrication facilities in

Peterborough and Toronto belong to GE Hitachi Canada and operate under a single license.

The 2013 performance ratings for the uranium processing facilities were determined and CNSC staff have rated each safety and control area based on the results and observations from inspections and desktop reviews. For 2013 all of the uranium processing facilities received a satisfactory rating in all safety and control areas.

GE Hitachi Canada also received a rating of fully satisfactory for environmental protection in recognition of the advanced pollution abatement technologies in place and their achievement of keeping releases of uranium to very low levels.

The Blind River refinery also received a rating of fully satisfactory for conventional health and safety in recognition of eight continuous years without a worker lost time incident.

Overall, these ratings indicate consistent management of safety systems at all facilities.

The graph on this slide shows the

maximum individual effective radiation doses for workers from 2009 to 2013. The red light on this chart displays the effective dose regulatory limit that a nuclear energy worker can receive in a year. As shown, the highest dose received by an individual worker at each of these facilities was below the annual dose limit of 50 mSv. These results also show that maximum individual effective doses to workers have been relatively consistent over time and 2013 values are representative of safe levels observed over the last five years.

Similarly, this graph shows the average individual effective radiation doses to workers from 2009 to 2013. The average dose received by an individual worker at each of the uranium processing facilities was well below the annual dose limit of 50 mSv.

This slide provides the dose to public for each uranium processing facility for 2013. Doses to the public from all uranium processing facilities continue to be well below their applicable regulatory and/or license limits. Trending at Cameco's Fuel Manufacturing Facility shows a decreasing public dose from 0.042 mSv in

2011 to 0.013 mSv in 2013, resulting from improved storage practices of finished fuel bundles.

To confirm the effectiveness of a mission abatement systems and to monitor the impact of uranium emissions from the facility on the environment, all facilities except GE Hitachi Canada in Peterborough operate high-volume air samplers.

A risk assessment for GE Hitachi Canada Peterborough has demonstrated that ambient air sampling is not required since the measured releases from the stack already result in levels lower than the Ministry of Environment standard for uranium in ambient air will take effect in July of 2016.

The results from the high volume samplers for 2013 are shown in this slide and indicate that the maximum annual average concentration of uranium in ambient air measured around any uranium processing facility was much less than the Ministry of Environment air standard for uranium. These results indicate that all uranium processing facilities have controlled releases of uranium and that the environment and people are protected from airborne releases.



Soil monitoring programs are intended to monitor the long-term effects of air emissions to show whether there is accumulation of uranium in soil in the vicinity of the facility. This slide shows the annual average uranium concentrations in soil. The data for all facilities is well below the most restrictive guideline the Canadian Council of Ministers of the Environment Guideline of 23 micrograms per gram uranium for residential or parkland use.

Soil sampling results in 2013 continue to indicate that current uranium emissions from the uranium processing facilities are not resulting in levels observed in soils that would pose a risk to people or to the environment. Moreover, these results verified that controls on uranium emissions within the facilities are effective at preventing the accumulation of uranium in soil.

As shown on this slide there were no recordable lost time incidents in 2013 at any of the uranium processing facilities. Because the frequency of lost time incidents have always been low at these facilities there are no trends with respect to the number of lost time incidences

reported to the CNSC.

CNSC staff conclude that the uranium processing facility licensees have been implementing their conventional health and safety programs satisfactorily during 2013 and their programs are effective in protecting the health and safety of persons working in their facilities.

In the next few slides I will provide some specific highlights for each uranium processing facility for 2013, commencing with the Blind River Refinery.

The Blind River Refinery operates a Class 1B nuclear facility in Blind River, Ontario. The refinery processes natural uranium ore concentrates into natural uranium trioxide. Cameco receives uranium ore concentrates from the mines and mills worldwide. In fact, approximately 80 percent of the world's uranium destined for nuclear power plants is refined at the Blind River Refinery.

CNSC staff note that we will be utilizing the resources of the participant funding program to meet with the Mississauga First Nation community to discuss Cameco's Blind River Refinery operations and performance. This meeting is

scheduled for October 15th, 2014 and the outcome of this meeting will be communicated to the Commission in the 2014 CNSC Staff Report on the Performance of Uranium and Nuclear Processing Facilities.

In 2013 CNSC staff conducted three compliance inspections and the IAEA conducted five safeguard inspections. Of the three inspections conducted by CNSC staff, they focused on radiation protection, conventional health and safety and environmental protection.

Findings resulting from these inspections were mainly related to program and procedural adherence. None of the identified actions posed an immediate or unreasonable risk to the health and safety of workers, the public or to the environment. Rather, the findings identified improvements which are required to maintain or to improve safety.

There were two modifications to the facilities operations, processes and safety systems in 2013. These modifications were reflected in a revision to the licensee's safety analysis report in 2012. The modifications included changes to the auger sampling or

delidding station and the installation of whole body monitors at the main entrance to the facility.

The modification to the auger sampling was the final corrective action taken as a result of an incident in June 2012 where a Cameco employee had a significant uptake of uranium concentrate. Details of this incident were reported to the Commission in the 2012 annual report. The installation of the whole body monitors was done to address a CNSC action item on improving the Blind River Refinery's contamination monitoring program.

In 2013 no license limits were exceeded.

This annual report describes two skin dose action level exceedances at the Blind River Refinery. Both instances involved Blind River workers exceeding the monthly skin dose action level of 10 mSv, with dosimeter results of 13.9 mSv and 14.6 mSv. This represents a small percentage, approximately 3 percent of the CNSC's regulatory dose limit to the skin of 500 mSv. Cameco reported, investigated and implemented corrective actions that were deemed acceptable by

CNSC staff.

Cameco has demonstrated the implementation of an effective occupational health and safety management program which has resulted in Cameco's ability to keep their workers safe from occupational injuries. The refinery achieved eight years without a lost time incident.

The Blind River Refinery continues to operate within the framework of the *Nuclear Safety and Control Act* and it met all requirements as per its operating license. Its conventional health and safety record is excellent and, overall, this facility operates safely.

I will now discuss the Cameco Fuel Manufacturing Facility. Cameco Fuel Manufacturing operates a Class 1B nuclear facility in Port Hope, Ontario where they primarily produce natural uranium dioxide fuel bundles for CANDU reactors.

In 2013 there were several modifications to the facility. Major improvements include upgrading the sintering furnace, a new extraction unit in the Ceramics Laboratory, and improvements to the fire protection system.

All modifications to the facility with a potential impact to safety are evaluated

through Cameco's internal change control and design change control process.

The 2013 modifications did not alter the licensing basis and were within the safety case described in the licensee's safety analysis report.

Several program and procedure documents were also updated, including the waste management procedure, to reflect Cameco's waste minimization efforts that were accepted by the CNSC in 2012.

Five inspections were completed in 2013. CNSC inspections include core checks to verify that the licensee is taking appropriate measures to protect the public, the environment, and the workers.

In addition, the inspections include focus areas to assess the health of various programs. The focus areas for 2013 were environmental protection, emergency preparedness and response, management system, and security.

From the inspections, CNSC Staff can confirm that CFM is operating the facility safely. Improvements in program documentation, records, and administration were requested by

staff. CFM is taking appropriate actions to address the findings.

As previously reported to the Commission in February 2013, Cameco discovered errors in the internal dose calculations. These errors were corrected and Cameco workers' dose results were recalculated from 2013 to 2011.

The investigation revealed that no regulatory dose limits were exceeded, as the recalculated annual maximum effective dose to workers remained well below the annual regulatory dose limit of 50 millisieverts.

Cameco reported this event to the CNSC in a timely manner and notified all affected workers of their recalculated internal doses.

CNSC staff reviewed the recalculated doses along with the corrective actions taken by Cameco, and CNSC staff are satisfied with the measures taken to resolve this issue.

One transport event was reported during the fourth quarter of 2013 in which five drums filled with uranium dioxide production scrap were transported from the CFM facility to the Port Hope conversion facility with inappropriately-

applied lids.

Cameco reported the incident to the CNSC, completed an investigation of the incident, and implemented corrective measures. There were no releases to the environment, nor dose to workers from this event.

Cameco reported two action level exceedances in 2013 that involved two separate occasions where two Cameco workers' quarterly internal doses were determined to be 0.82 millisieverts and 1.02 millisieverts respectively, slightly above Cameco's internal dose action level of 0.8 millisieverts per quarter.

In both instances Cameco reported, investigated, and implemented corrective actions as required.

CNSC staff is satisfied with Cameco's response to these action level exceedances.

And, finally, there were no lost time accidents and no action level exceedances related to environmental protection at this facility.

The Port Hope conversion facility is located in the Municipality of Port Hope,



Ontario, situated on the north shore of Lake Ontario.

The Port Hope conversion facility primarily converts uranium trioxide powder produced by Cameco's Blind River refinery to uranium dioxide and uranium hexafluoride.

Uranium dioxide is used in the manufacture of CANDU reactor fuel, whereas uranium hexafluoride is exported for further processing into fuel for light-water reactors.

During 2013 there were no significant process modifications that affected safety significant systems and no licence limits were exceeded.

Following the acceptance of the environmental assessment for the Vision 2010 Project, now referred to Vision in Motion by the Federal Minister of the Environment, work is being undertaken by Cameco to identify the project scope for implementation.

Cameco's focus in 2014 will be to move forward with the project planning and licensing activities with the intention of applying for amendment to the Port Hope Conversion Facility operating licence in 2014 or 2015 to

authorize activities for this project.

CNSC Staff find that groundwater quality across the Port Hope conversion site has remained stable and there has been no change in harbour water quality.

CNSC staff continue to engage with the Ontario Ministry of Environment staff as well as staff at Environment Canada who also have an interest in these groundwater releases.

The Port Hope Conversion Facility's soil monitoring program includes annual sampling in the municipality, including the Waterworks parking lot located adjacent to the facility.

The average uranium in soil concentrations in 2013 remain similar past years. This indicates that the current uranium emissions from the Port Hope Conversion Facility have had no measurable impact on soil.

In 2013 CNSC Staff conducted six compliance inspections and the IAEA conducted five safeguard inspections. Of the six CNSC-lead inspections, CNSC Staff focused on management system, radiation, environmental protection, conventional health and safety, emergency

preparedness, transportation and security.

The majority of the findings from these inspections were related to program and procedural adherence. None of the resulting actions raised in the inspections reports pose an immediate or unreasonable risk to the health and safety of workers, the public, or to the environment.

There are two monthly gamma action level exceedances at one of Cameco's fence line monitoring locations. The UF6 cylinders causing the elevated gamma dose rate removed and fence line gamma levels were closely monitored following these exceedances. The CNSC Staff visited the site following report of these exceedances and are satisfied with the actions taken by Cameco, and confirm that doses from this facility remain well below the public dose limit.

Cameco also reported two events to the CNSC in 2013 at the Port Hope conversion facility. The first in February 2013 relates to a UF6 cylinder valve which was bent when the valve cover came in contact with a doorframe when backing out of the building.

The emergency response team was

activated, there was no release to the environment, and corrective actions implemented by Cameco have been reviewed by CNSC Staff and found to be adequate.

The second event in June 2013 involved discharge drum rupture discs in UF6 plant which failed prematurely due to nickel/fluoride corrosion. This caused a small fluorine fire. The facility was shutdown safely with no injuries, no environmental releases, and minimal damage to the plant.

CNSC Staff are satisfied with the corrective actions initiated by Cameco to prevent future reoccurrence and continue to follow-up with compliance verification activities.

There were no lost time incidents in 2013.

I will now discuss GE Hitachi Canada's facilities in Toronto and Peterborough.

Please note follow-up actions resulting from the Commission meeting that was held in Toronto in December of last year will be discussed at the end of this presentation.

GE Hitachi is a Canadian company that operates two Ontario sites under one CNSC

licence; one site in Toronto, one site in Peterborough.

GE Hitachi manufactures nuclear fuel bundles from uranium dioxide powder.

In 2013 GE Hitachi Canada added a fire separation wall between buildings in Peterborough and also added electrical supervision of two fire protection valves to improve overall fire safety at its Peterborough plant.

GE Hitachi Canada also upgraded automation equipment controls and guarding to improve safety. Security improvements were also made at the Toronto Facility. All changes were within the licensing basis and did not change the safety case, as described in the facility safety analysis report.

In January 2013, as mandated by the CNSC, GE Hitachi Canada submitted a revised public information program to meet CNSC's new regulatory requirements.

This program's implementation and its performance was the subject of a CNSC inspection in June 2014, which resulted in enforcement actions towards improvement of their public information program.

Overall, CNSC Staff find that GE Hitachi Canada's public information program meets the intent of CNSC requirements and is commensurate with the type and risk of its facility.

In 2013 CNSC Staff conducted two inspections at GE Hitachi Canada that focused on safety in control areas of radiation protection, environmental protection, conventional health and safety, security, and waste management. Enforcement actions were raised, of which two related to the Waste Management Program which remain open.

CNSC Staff are satisfied with the schedule to address these actions and to continue to follow GE Hitachi's progress in this area.

For 2013 there were no licence limits nor action level exceedances related to GE Hitachi's air and liquid effluents.

There was one radiation protection action level exceedance for internal dose wherein urinalysis results from an operator reported 13.5 micrograms per litre of uranium against an action level of 10 micrograms uranium per litre.

GE Hitachi Canada reviewed its

personal protection equipment training and practices and implemented corrective actions to its procedures as a result of this event. CNSC Staff found the licensee's corrective actions to be satisfactory.

GE Hitachi Canada maintains a satisfactory program for conventional health and safety with no lost time injuries reported for 2013.

I will halt the presentation at this time to answer any questions you may have.

**THE PRESIDENT:** I think we confused ourselves here. Because you are going to talk later on about the all the actions that... Why don't you -- maybe for all of ourselves, but why don't you continue on the GE Hitachi so we can open up the questions for all of this?

**MR. RINKER:** Thank you.

I will now turn the presentation to the nuclear substance processing facilities.

There were three nuclear substance processing facilities, all of which are located in Ontario. SRB Technologies is a tritium processing facility located in Pembroke, Ontario, its licence will expire in 2015 and a renewal hearing is

currently scheduled for May 2015.

Nordion possesses nuclear substances and is located in Ottawa, Ontario. Nordion's licence will also expire in 2015 and a renewal hearing will be held in late summer 2015.

Shield Source Inc. or SSI was a tritium processing facility located in Peterborough, Ontario. SSI was issued a licence to abandon in March 2014, and the facility is no longer under CNSC regulatory oversight. The building that SSI was located in is, however, safe and available for any industry to use for other non-nuclear processes.

CNSC regulatory oversight of SSI in 2013 was intensive, with site inspectors on site during all clean up and remediation activities to ensure worker protection and protection of the public and the environment.

In 2013 doses to workers at Nordion remained very low, with a maximum annual effective dose of 6.4 millisieverts and an average effective dose of 0.6 millisieverts.

Doses to workers at SRB also remain low with a maximum annual effective dose of 1.9 millisieverts and an average effective dose of



0.2 millisieverts.

The graph on this slide shows the maximum average individual effective radiation doses at both facilities. The red line in this chart displays the effective dose regulatory limit a nuclear energy worker can receive in a year. As shown, the highest dose received by an individual worker at each of the facilities was below the annual dose limit.

This data shows that doses to individual workers are safe and radiation protection programs at both facilities have been effective.

There were no lost time injuries at SRB Technologies. There was one lost time injury at Nordion in 2013 and was the result of an employee bending over to pick up a portable piece of equipment and experienced pain in their lower back when standing. The injury resulted in 18 days of lost time.

Overall, CNSC Staff rated all safety and control areas for Nordion as satisfactory with the exception of conventional health and safety, environment protection and security, which are rated fully satisfactory.

Despite a single lost time incident, Nordion maintains a strong program for conventional health and safety. In recognition of this program, Nordion was recognized in 2013 by the Canadian manufacturing industry as one of Canada's safest employers in the category of manufacturing.

And it is also recognized in CNSC's evaluation of the conventional health and safety program with a fully satisfactory rating.

Nordion also maintains programs for environmental protection and security to a level that warrants rating to fully satisfactory.

Similarly for SRBT, CNSC Staff rated all safety and control areas as satisfactory with the exception of conventional health and safety, which is rated fully satisfactory as a result of its consistent record of worker protection.

I will now discuss SRB Technologies in more detail.

SRB Technologies is licensed to process tritium gas to produce gaseous tritium light sources and manufacture different radiation devices containing these sources. SRBT operates

under a licence issues in 2010 that expires in 2015.

The SRBT facility was inspected once in 2013 with a broad focus covering the safety and control areas of environmental protection, radiation protection, conventional health and safety, training, operational performance, and packaging and transport.

During 2013 the average annual effective dose received by workers at SRB was 0.2 millisieverts. CNSC Staff are satisfied that SRBT is keeping doses to workers as low as reasonably achievable.

SRBT continues to effectively control air and liquid releases from their facility, and all releases remain consistently below licensed limits.

The most exposed member of the public would receive a dose of 0.0068 millisieverts per annum as a result of these releases.

In 2013 there were no lost time incidences at SRB and SRB continued to operate within the framework of the *Nuclear Safety & Control Act*, and met all requirement as per its

operating licence.

I will now discuss Nordion Canada Inc. in more detail.

Nordion Canada Inc. is a nuclear substance processing facility located in Ottawa, Ontario.

Nordion processes unsealed radioisotopes, such as Iodine-131 for the health and life sciences and manufactures sealed radiation sources for industrial applications. Nordion also exports cobalt-60 around the world.

In 2013 CNSC Staff conducted three inspections at the Nordion facility that included environmental protection, radiation protection, fire safety and conventional health and safety, as well as transport, packaging and security.

Enforcement actions were raised during these inspections. At this time one item remains outstanding, the item pertains to nuclear substance inventory record improvements. CNSC Staff is satisfied with Nordion's follow-up and will continue to monitor Nordion's progress in this area.

No regulatory limits were exceeded during the current licence period. Nordion was

acquired by Sterigenics in July 2014. Nordion still operates under the same name, however the Class 1 nuclear substance operating licence was transferred to reflect Nordion's new corporate identity. The only change in the CNSC licence is a new corporate number.

During 2013 there were no significant process modifications that affected safety significant systems and no licence limits were exceeded.

Air emissions and liquid releases from the Nordion facility continue to be effectively controlled and monitored. No action level exceedances occurred in 2013.

Nordion's commitment to keeping releases as low as reasonably achievable is demonstrated by maintaining very low emissions and their ISO 14001 certification.

Under separate licences Nordion is issued independent of Nordion's Class 1B facility licence. Nordion exports cobalt-60 under these separate licences.

Four hundred and eight-nine such licences were issued to Nordion from August 2010 to June 2014. These licences authorize 605

exports of cobalt-60.

There are 17 occurrence of non-compliance with post-shipment verification since 2011. Greater compliance enforcement resulted in an administrative monetary penalty that was issued to Nordion in September of this year.

Nordion's performance under these export licences was considered below expectations.

I will now provide an update regarding the Shield Source Inc. facility.

Shield Source, or SSI, was a tritium processing facility located at the airport in Peterborough, Ontario. The SSI facility was remediated and decontaminated in 2013. The facility was cleaned up and met all regulatory requirements for its release.

Releases from the facility during 2013, while cleanup activities were being conducted, were much less than releases from the facility during operation. Worker exposure to tritium was also much lower during cleanup activities than during the operation of the facility, because tritium was no longer being processed.

As of April 2014 the facility was

released from regulatory control and the facility is now a safe work environment for any non-regulated business or industry.

CNSC Staff continue to monitor the environment near the SSI facility for the purpose of improving our understanding of how tritium cycles in the environment. The results indicate that tritium concentrations in soil, surface and vegetation continue to decrease, as expected.

A report is being developed and will be posted on the CNSC website for members of the public who may have an interest in the status of the environment near this facility.

During operation, the primary critical receptor was a resident living across the road from the airport whom used a ground-water well for the supply of drinking water. Tritium was never detected above the detectable limit in this well during operations.

The airport authority recently purchased this property and it is no longer a residential home. Moreover, the airport intends to decommission the groundwater well at this site and it will no longer be a point of potential exposure to members of the public.

In conclusion for this annual performance report, the CNSC compliance activities for 2013 confirm that for uranium and nuclear processing facilities all 14 safety and control areas were rated a satisfactory or better.

Radiation protection programs were effective to keep doses as low as reasonably achievable. Environmental protection programs were effective at keeping environmental impacts as low as reasonably achievable. And finally, conventional health and safety programs continue to protect workers.

These results demonstrate that the uranium processing facilities and the nuclear substance processing facilities have operated safely in 2013 and that the environment and the Canadian public continues to be protected.

I will now provide updates to the Commission on other matters of regulatory interest.

January 29, 2014 Cameco Corporation reported to the Canadian Nuclear Safety Commission of an event that occurred on January 28, 2014 at the Port Hope Conversion Facility located in Port Hope, Ontario.



Where Cameco reported a loss of computer control that is associated with hydrogen gas and fluorine gas production in the UF<sub>6</sub> plant.

This resulted in multiple electrolytic cells being drawn into a state and, in some instances, hydrogen and fluorine gas separation was lost within individual cells. This could have caused, but didn't, an explosion or seriously damaged the UF<sub>6</sub> plant.

The Commission was informed of this event in February 2014, and the staff's update was provided to the Commission again in June of 2014.

At the request of the Commission, a detailed memo is being prepared to provide additional information on this event, including a summary of the processes in the UF<sub>6</sub> plant, the safety and control measures that were in place and how the safety and control measures performed during the event.

CNSC staff note that there were no worker injuries, no dose limits exceeded and no releases within or outside the plant as a result of this event.

With respect to the 2013 annual

report, the management system and human performance management, which includes training, for Port Hope conversion facility are rated as satisfactory despite this event. As a result of this event, however, the CNSC staff has -- have heightened regulatory oversight of the facility for 2014.

The outcome of this heightened regulatory oversight and its impact on the performance ratings of the relevant safety and control areas will be reflected in the 2014 annual report.

I would like to provide an overview of the work undertaken by CNSC staff following the Fukushima nuclear accident that happened in 2011.

In 2011, a CNSC directive was issued requiring uranium and nuclear processing facilities to review their safety cases and report on implementation plans for short-term and long-term measures to address any identified gaps.

Licensees for our uranium and nuclear substance processing facilities have completed all of their improvement initiatives, including flood modelling reassessment for the

Blind River refinery and an assessment of critical spare parts at the Port Hope conversion facility.

CNSC staff are satisfied that all uranium and nuclear substance processing facilities have completed their facility-specific improvement initiatives to address lessons learned from the Fukushima accident.

Best Theratronics was issued a Class 1B nuclear substance processing facility licence effective July 1<sup>st</sup>, 2014.

In the decision to issue the licence, the Commission requested that Best Theratronics have an acceptable financial guarantee included in the Licence Condition Handbook by no later than January 31<sup>st</sup>, 2015.

The Commission also requested a progress update in October of 2014.

On September 12<sup>th</sup>, 2014, CNSC staff received a revised financial guarantee from Best Theratronics. CNSC staff are currently reviewing the document, can confirm that the proposed financial guarantee vehicle is similar to the one discussed by CNSC staff at the May 2014 hearing.

The Commission will be requested to determine the acceptability of the financial

guarantee following staff's review.

At the December 2013 Commission meeting, GE Hitachi Canada was tasked by the Commission with five action items related to uranium in soil and aspects of GE Hitachi Canada's public information program.

The following provides a status update of these five actions.

Action 1. GE Hitachi Canada reported elevated uranium in soil values in 2012 in a localized area near its fence line adjacent to the rail line. In the December 2012 meeting, GE Hitachi Canada committed to the Commission to review possible remediation options.

Subsequent detailed characterization of the area showed an average of 3.2 parts per million uranium and a maximum of 12.2 parts per million uranium. This is below the values previously sampled, and well below the guideline value of 23 parts per million for residential and parkland use.

GE Hitachi Canada is in the process of discussions with the adjacent landowner about remediation options, if any.

CNSC staff considers this action

to be open and will continue to track.

Action 2. GE Hitachi Canada was directed by the Commission to post the emergency response plan on its web site, excluding protection sections, and consider other means of informing the community about this plan.

GE Hitachi Canada has added a summary of their transport emergency response plan as committed, and informed the committee(sic) through its April 2014 community newsletter, which was delivered to approximately 800 residents.

Staff opinion, based on community feedback, is that GE Hitachi Canada could do additional promotion of these postings on their web site to ensure better community awareness.

CNSC staff continue to monitor progress in this action and consider it open, and will continue to monitor progress.

Action 3. GE Hitachi Canada was tasked by the Commission to provide details on insurance arrangements, two, evaluation of worst-case scenarios and potential consequences, and possibly publish this information on the company's web site, and three, release the name of the third party who conducts verification of GE Hitachi's

environmental monitoring systems.

The first action was completed by GE Hitachi Canada through a letter to the CNSC.

The second action, GE Hitachi Canada posted a video on its web site that detailed its operations in Toronto, its safety practices, worst-case scenarios and its consequences.

The third action was completed by posting the third party's name on GE Hitachi Canada's web site.

CNSC staff consider Action 3 to be now closed.

Action 4. GE Hitachi Canada was directed by the Commission to post better information on transportation of uranium dockside and fuel pellets, as well as put information on their emergency drills in the public domain.

GE Hitachi Canada has added a video on these issues as well as committed to providing public disclosure of future emergency drills and related activities on their web site.

GE Hitachi Canada is in the process of identifying future activities like emergency drills with the Toronto police and fire

department that can be published in the public domain for additional information.

CNSC staff continue to monitor progress on this action and consider it to remain open, and will continue to monitor progress in this area.

And finally, Action 5. In 2013, GE Hitachi Canada implemented a revised public information program as mandated by the CNSC. This included an updated web site, an improved newsletter, a newly-formed community liaison committee and several outreach activities to community members and local, provincial and federal elected representatives.

Subsequent to the 2012 Commission meeting, GE Hitachi Canada also involved additional corporate resources to enhance their web site content, format and information presented and have added information as requested by the Commission.

CNSC staff have continued to monitor GE Hitachi Canada's progress in this matter through quarterly reports and a 2013 annual compliance report.

As well, as part of the CNSC's

compliance verification plan, staff have inspected, and will continue to do so, the public information program of GE Hitachi Canada.

Several enforcement actions have been provided to GE Hitachi Canada as part of the recent inspection that included improvements to GE Hitachi Canada's target audience, program objects and its communication products and their program review and feedback process.

Staff have also emphasized the need for GE Hitachi Canada to continue to be proactive in this public outreach.

Overall, CNSC staff find GE Hitachi Canada has implemented a public information program that meets the intent of CNSC's regulatory requirements that is commensurate with the type and risk of this facility.

This concludes our presentation. I will now pass it back to Mr. David Newland.

**MR. NEWLAND:** Thank you very much, Mike.

That completes our presentation, and we're now prepared to take any questions that the Commission may have. Thank you.



**THE PRESIDENT:** Thank you.

Before we get into the question period, I'd like to hear from some of the facilities that we heard about. And starting from Cameco, I understand that Mr. Mooney would have some comments.

Mr. Mooney, can you hear us?

**MR. MOONEY:** I can hear you. Can you hear me?

**THE PRESIDENT:** Try again.

**MR. MOONEY:** Can you hear me now?

**THE PRESIDENT:** Yeah. You still need to get closer to the mic.

**MR. MOONEY:** Okay. I'll bring it really close to me. Is that better?

**THE PRESIDENT:** Yeah.

**MR. MOONEY:** So good afternoon, President Binder and Members of the Commission. For the record, my name is Liam Mooney, and I am Cameco's Vice-President of Safety, Health, Environment Quality and Regulatory Relations.

With me today, I'm joined by Dave Workman, Director of Regulatory Compliance and Licensing for Cameco's Fuel Services Division.

I'd like to thank the Commission

and staff for facilitating our participation from Saskatoon, where Cameco's head office is located.

Cameco owns and operates the Blind River refinery, the Port Hope conversion facility and Cameco fuel manufacturing, which together comprise our fuel services division.

Cameco's highest priorities are the health and safety of workers and the public as well as the protection of the environment.

As a company, we are proud of the 2013 performance of the fuel services division as has been detailed here today by the CNSC staff.

I'm pleased to report that the division had its safety year in history in 2013. Direct employee involvement in safety initiatives over the past several years is clearly having the desired outcome.

Radiation protection and environmental performance continue to be areas of focus at all three licensed fuel service division operations. As CNSC staff have noted in their reports, employee radiation dose and emissions to air are a fraction of the regulatory limits and well below action levels.

All three sites have well-

established and mature management systems that provide opportunity for systematic improvement while maintaining strong performance.

Cameco is committed to ensuring that our operations continue to be safe, clean and reliable.

Thank you, and we are pleased to respond to any questions that you may have.

**THE PRESIDENT:** Thank you.

I'd like to turn the floor now to -- I understand Mr. Mason will speak on behalf of GE Hitachi.

**MR. MASON:** For the record, Peter Mason, GE Hitachi. Good afternoon, Mr. President and Members of the Commission.

We do not have anything -- a presentation prepared, but I would like to address the first action item on the list that was presented by the Commission staff earlier.

**THE PRESIDENT:** Go ahead.

**MR. MASON:** The -- in fact, we did look at the patch of land on CP Rail's property. We had a third party by the name of Trinity take 18 samples. And per the staff's report, the average on the surface was 3.2 micrograms per

gram, with a maximum of 6.2 on the surface. And at depth, the average was 5.5 with a maximum of 12.2.

We did discuss it with CP Rail because it is their property, and we've also sought legal counsel on what we should do.

The recommendation has been that we take no action. It would cause something of a -- what was deemed to be a serious precedent if we started remediating property that was almost down to background levels, certainly way below the residential and parkland levels.

So we don't perceive to be taking any further action on that three metre square patch that was of some concern at the December meeting.

Thank you.

**THE PRESIDENT:** Thank you. I'm sure we'll get into that.

But before we go, I'd like to hear whether SRB has anything to say or to add.

Mr. Levesque?

**MR. LEVESQUE:** Stephane Levesque, for the record. I'm the President for SRB Technologies.

And we've -- in addition to the performance indicators that you've seen for 2013, we've continued to make improvements to the facility while in 2014, and a number of organizational improvements and improvements to our programs.

And if you have any questions on those of what you've been presented today, I'm joined here today by the Vice-President, Ross Fitzpatrick, our manager of Health and Regulatory Affairs, Jamie MacDonald, project engineer Courtney Sinclair. And if there are any questions on a revision of a financial guarantee, we have our independent consultant, Doug McNab, who's been intimately involved with the decommission of the Shield Source facility. We've now retained with us to look at reviewing our decommissioning program.

Thank you.

**THE PRESIDENT:** Thank you.

I'd like now to hear from Nordion. I understand that you have a short presentation.

And Mr. Beekmans.

**MR. BEEKMANS:** Rick Beekmans here, for the record.

We have a very short presentation to provide.

**MR. LEBLANC:** I think we have just a slight technological challenge. We expected it to be in the middle, so just a second.

--- Pause

**MR. BEEKMANS:** Good afternoon. My name is Rick Beekmans. I'm the Director of Quality Assurance and Environmental Health and Safety Compliance.

I want to thank the CNSC Commission and the staff for the opportunity to speak to you today.

I only expect to take a few minutes of your time. I will provide you with a brief overview of the changes to Nordion as a result of the acquisition by Sterigenics, a global leader in contract sterilization services. I will provide you with some information about Sterigenics and their own commitment to environmental, health and safety, and I will introduce the Nordion team here today to respond to any questions you might have.

Nordion announced on March 28<sup>th</sup>, 2014 that it had entered into a definitive

agreement to be acquired by Sterigenics. The Sterigenics acquisition of Nordion was completed in August 2014.

Nordion will continue to operate in Canada as a separate business unit utilizing the same Nordion Canada Inc. name. Nordion continues to have its head office on 447 March Road in Kanata, Ottawa.

Nordion's EH management, safety compliance systems remain unchanged as a result of the acquisition.

There were some employee changes consistent with going from a public company to a private company. There were no employee changes in the operating areas or with the environmental health and safety staff as a result of the acquisition.

Nordion's commitment to environmental health and safety compliance has not changed as a result of the acquisition from Sterigenics.

Sterigenics is a recognized global provider of contract sterilization services for medical device and pharmaceutical industries, and has been a customer of Nordion for over 30 years.

Sterigenics is headquartered in Chicago in a Chicago suburb of Deerfield, Illinois, and offers technology in all leading sterilization modalities, including gamma, ethylene oxide, electron beam and x-ray.

Sterigenics is a global contract sterilization leader, with over 40 locations in North America, Europe and Asia. In Canada, Sterigenics operates an ETO facility in Toronto.

Sterigenics employs 1,300 employees worldwide in its sterilization business, and serves over 2,400 customers.

Now, Nordion and Sterigenics have common values in the area of quality environment and health and safety and compliance. Sterigenics' vision makes safety and quality their highest priority.

As Nordion was prior to the acquisition, Sterigenics is dedicated to protecting the community and the environment in which they work, and comply with all applicable environmental regulations.

Nordion remains committed to protect health, safety and security of the environment.



Now I would like to introduce the Nordion staff that will be here when we have the opportunity to answer any questions.

With me will be Ron McGregor, the VP of QA Regulatory and EHS Compliance. Ron is primarily responsible for the medical isotopes division, and I am primarily responsible for the sterilization division.

Shannon Lacasse, EHS Specialist, supports a number of activities, including sealed source tracking, facility safety analysis and our environmental health and safety committee.

Jennifer Mahoney, EHS Specialist, is primarily responsible for our fire protection program, our 14001 environment program across all three Canadian sites. She also plays a major role in our emergency response programs.

Richard Decaire, Senior Manager of Radiation Safety and Compliance, is responsible for radiation protection in Nordion's medical isotope division.

Phil Danks, Senior Radiation Safety and Training Specialist, is responsible for executing many of our radiation safety training programs in the company, and also has

responsibility for radiation protection in Nordion's sterilization division.

And finally, Greg Fulford, the Nuclear Transportation Specialist, is responsible for regulatory compliance of all packaging and transport.

That concludes my presentation. Thank you for the time to allow me to give you this brief overview.

**THE PRESIDENT:** Okay. Thank you.

Before we actually go into the full open question period, I'd like to -- Commissioners, we agreed to go through some of our -- we had two written interventions that we got.

One -- the first one is from Mr. Rinaldi, CMD 14-M59.1. Let me see if I've got this right.

**CMD 14-M59.1**

**Written submission from**

**Lou Rinaldi, M.P.P., Northumberland-Quinte West**

**THE PRESIDENT:** No, I think this is CMD 14-M59.2.

And are there any questions on

that particular written submission?

Everybody seen it?

Well, let me start, then.

Mr. Rinaldi keeps talking about information session to inform the community. This is -- this letter is support of Port Hope.

I think the next presentation is also from Port Hope, from the Mayor.

People talk about information sessions. I'd like some -- a little bit more information about those information sessions.

How often do they get conducted, are they open to the public?

Staff?

**MR. RINKER:** Mike Rinker, for the record.

So the information sessions themselves are designed for the public, so they're a public forum.

Generally, Cameco provides information, status updates, any relevant information that could be new and then there's an open forum for the public to raise questions.

They've had a number of -- I'd say over the last eight years, they've -- I think it's

on the order of 20 or so information sessions have occurred. I'd ask Cameco to confirm the numbers.

We attend these -- the CNSC staff attend these information sessions as well just to get a -- to understand the flavour of the public's interest. And I would say recently, I think it was May of 2014, CNSC staff did attend a session that was well attended by the public.

The questions at this stage of the facility were more about time lines, when is vision and motion going to happen as opposed to questions about a fear of the facility.

So we felt it was a very healthy relationship that we observed between the licensee and the public.

This is not what we have observed in the past. If you looked a decade ago, these sort of engagements between the licensee and the public in Port Hope, there was a lot of anxiety around the nuclear industry. And if the most recent meeting is evidence, I would say that that anxiety is lessened.

**THE PRESIDENT:** Cameco, do you want to add anything to this?

**MR. MOONEY:** It's Liam Mooney, for

the record.

We confirm our commitment to open a transparent communication with stakeholders. And the community forms that Mr. Rinker was speaking to do occur on a regular basis. There have been more than 20 over the last several years and they are focused on topics of interest that have been raised in discussions with various stakeholders.

**THE PRESIDENT:** And so when, let's say an incident happens, do you appear in front of -- in those public hearings or public information sessions and explain them away, put some material on the web, et cetera?

**MR. MOONEY:** It's Liam Mooney, for the record.

Our public disclosure protocols are posted on a website and we do post reportable environmental events on the website. In addition to the community forms there is quarterly updates to the Port Hope elected council.

So there is a variety of different means for communicating in relation to matters of interest in the community.

**THE PRESIDENT:** Okay, thank you.

Anything else on this one?

**CMD 14-M59.2**

**Written submission from the  
Municipality of Port Hope**

**THE PRESIDENT:** What about the next written submission from the Municipality of Port Hope? This is the M59.2 from Ms Thompson, the Mayor. Any questions?

Okay, just one question. I hear -  
- I have heard often about on the first page she keeps talking about regular opinion surveys. Have we seen some of those opinion surveys?

--- Pause

**MR. RINKER:** I will ask Aimee Rupert, our specialist in public information programs.

**MS RUPERT:** Yes, we do review the public opinion surveys provided by Cameco and they are also posted on Cameco's website.

**THE PRESIDENT:** Actually, I would be interested in seeing some of them. I don't know if they are the whole community survey kind of on nuclear issues.

**MS RUPERT:** Well, on Cameco's facilities, yes.

**THE PRESIDENT:** Cameco...?

**MR. MOONEY:** It's Liam Mooney, for the record.

I think that the overall tenor of those summaries that are posted speak to the support that we see from the community in Port Hope and the two interventions that we have in front of you from both Mayor Thompson and the MPP for the area speak to that overall support for our facilities and continued activities in the Port Hope area.

**THE PRESIDENT:** Okay, thank you. Anything else?

Okay, let's start the formal question period and starting with Ms Velshi.

**MEMBER VELSHI:** Thank you, Mr. President.

My first question is for GE Canada and it's on page 54 of the CMD, on CMD 14-M59. And it's on your conventional health and safety performance wherein 2009, '10 and '11 it was fully satisfactory and in the last two years it is satisfactory, a trend that we don't normally see.

What we do see and like to see is improvement over time.

But maybe I can ask staff to comment on this first, on why the decline in the rating and is this a cause for concern? If we look at just lost time injuries there is certainly no indication that there has been any deterioration in performance.

**MR. AMARLAJ:** Julian Amarlaj, for the record. I am the project officer currently making oversight on GE Hitachi Canada.

The staff's rating for a fully satisfactory on conventional health and safety primarily had to do with our assessment of their program design at that time. Subsequently, in 2012 when Cameco's relicensing had also happened, we found that the peer facilities had caught up with these standards in terms of conventional health and safety and the current industry standard reflects what the GE Hitachi's performance and practices were and, hence, we felt that GE Hitachi warranted a satisfactory rating.

**MEMBER VELSHI:** So to make sure I'm understanding it, it's not that their performance deteriorated, it's just that they want



better than the rest in the industry then?

**MR. AMARLAJ:** That is right. Their performance had stayed consistent. It is just that the other practices and peer facilities have caught up to the performances and the standards currently in place with regard to GE Hitachi.

**MEMBER VELSHI:** Thank you.

GE, any comment on that?

**MR. MASON:** No, I think I have commented on these ratings before.

**MEMBER VELSHI:** Well, you may want to refresh our memories and see what your comment was around conventional health and safety rating in particular, please.

**MR. MASON:** For the record, Peter Mason, GE Hitachi.

I think in the past I have requested greater information from the staff on what are the criteria for these ratings because, as GE Hitachi, we strive to be the very best we can be and so these ratings are extremely important to us.

**MEMBER VELSHI:** Thank you. So if I hear you correctly, you are saying you haven't

seen much transparency on what goes behind the rating and it's hard for you to then appreciate what these ratings really mean?

**MR. MASON:** For the record, Peter Mason.

That is correct.

**MEMBER VELSHI:** Thank you.

Slide No. 11, a question for staff, please, and it's more to just get confirmation on my understanding on effective dose to an individual.

Does this factor in skin dose and extremity does as well and their appropriate weighting factor or is this just whole body dose?

**MS PURVIS:** Caroline Purvis, Director of the Radiation Protection Division, for the record.

So certainly these are effective doses and they take into account the doses to both as a result of intakes from radioactive substances as well as exposures to the whole body. Skin doses and extremity doses are not represented in this slide, but they are detailed in the CMD and tables in the appendices.

**MEMBER VELSHI:** Thank you.

And for this round my last question again is to GE Hitachi and it's on your public information program.

When we had met last year we had spoken extensively about assessing community support and opinion for your facilities and we did talk about opinion surveys and perhaps the potential for you conducting those and we just heard from Cameco about that being a standard practice for them.

Can you tell us about what your thoughts are on that or whether any progress has been made or whether you are planning on carrying out any opinion surveys?

**MR. DESIRI:** For the record, Paul Desiri.

As mentioned by staff, we have an established communications team that includes representatives of legal, safety, business leadership, operations and other functions and we meet regularly to discuss such things as open items relating to our public information program. One of the items that we are still discussing is the benefits and the downfalls of doing a public opinion survey. So at present it's still an open

item for us.

**MEMBER VELSHI:** So in the absence of that how are you measuring the level of acceptance or concern of your community? Is there sort of a quantified tangible way that you are doing that?

**MR. DESIRI:** For the record, Paul Desiri.

There is a number of data that we look at. So one of them is emails through our public website which have dropped fairly sharply. We look at website visits which have also dropped in the last year. We look at phone calls, any information from members of the public. So as an example, last year at this time we were getting something like 20 calls a week and now we are down to a few a month.

So there has been a drop, I say, in concern in the level of interest in our facility and we see that in any communications we have with members of the public. We see that the level of concern has dropped.

**MEMBER VELSHI:** And in your outreach activities to the community, whether you have had public meetings or sessions like that, or

open houses if you have had any of those in the last year, what has been the level of engagement in that? How many people actually do show up for this?

**MR. DESIRI:** For the record, Paul Desiri.

The last public meeting we had in November, late November, had somewhere around 30 people attend. Unfortunately there were some distractions caused by the activists that attended and we couldn't complete the public meeting.

So for this year we are looking at holding a virtual public meeting. There have been other licensees that have had some success doing that, such as Bruce Power, and we have a tentative date of November 25th.

So this will allow members of the public to dial in to ask questions. We will have experts there to answer the questions, but we remove the risk of the meeting getting hijacked by activists.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Just to piggyback on that though, but you did create a community liaison. And I thought that your neighbours, your

really close neighbours, the ones I would go -- if I were you I would go there and try to develop a relationship with those. Do you feel any improvement in this kind of understanding and acceptability?

**MR. DESIRI:** For the record, Paul Desiri.

So one of the things we did last year was exactly that. We had meetings with the residents on the neighbouring streets. We offered them tours and several members of the community accepted.

Our community liaison committee is made up of several residents that live on the neighbouring streets and this is just the general impression I have that in the first meeting there was lots to discuss. There was lots of -- I wouldn't say anxiety, but it was a different tone than I'm seeing in the later meetings where it's more friendly and open and the exchange is more free.

I would say we have worked hard to build trust and I would say that we have done that successfully.

**THE PRESIDENT:** Thank you.

**MR. MASON:** Mr. President, if I could just add a point for the Peterborough site, we had meetings there at the local school with concerned members of the community, in particular parents of children at the school. We have given presentations.

We also extended out to the larger community to have people come to tour the facility. And, in actual fact, I think that was most successful in satisfying people's concerns when they are actually able to tour the plant where we had people working. They watch what people were doing. In fact, we even had people ask for a job.

So two weeks ago I met with the principal of the school to ask her if there had been any more feedback from the community through the parent-teachers committee and she said absolutely not. She has not had one question since that tour of the plant. We have asked her to put us on the agenda for the next parent-teacher's meeting, so we will continue that outreach to the Peterborough community.

**THE PRESIDENT:** Thank you.

**MEMBER VELSHI:** So a follow-up to

that, then. For your Toronto community are you considering doing something similar, or is it because of your experience last November you want to wait for some time before you entertain something like this?

**MR. DESIRI:** For the record, Paul Desiri.

So the forum we are using in Toronto is the community liaison committee. In Peterborough it is a slightly different situation. We have the school close by and they are essentially the equivalent of that.

**MEMBER VELSHI:** Okay.

**MR. MASON:** If I could add -- Peter Mason, for the record.

What we find is the public meetings that we have had in Peterborough have been very much about concerned genuine residents. In Toronto the meetings were very much about activists and in fact to the point where we were concerned about the safety not only of our staff, but of the few genuine residents that had pitched up. That concern was exacerbated by the fact that the police would not take any action to protect people from the aggressive nature of activists.



Where we have been successful again is with plant tours and we have had community leaders and members of local residences have actually toured our plant, and again very successful.

Thank you.

**THE PRESIDENT:** Thank you.

Monsieur Harvey...?

**MEMBRE HARVEY :** Merci, Monsieur le Président.

My first question is addressed to the staff. On page 13 of your -- this morning's presentation, certain -- sorry -- we have got doses to the public. In fact, I agree that the doses are quite a bit lower than the limit.

However, if we look at the figures we see that for Blind River while the doses are now 10 times over what it was in 2009, for Cameco it's 50 times over and for GE Peterborough it is 100 times. So despite the fact that it is much lower, can you explain that and what is the cause of such increases?

**MR. RINKER:** Mike Rinker, for the record.

So essentially the question

relates to a trending. And if we look at GE, for example, it is described in the report that the year 2009, '10 and '11 GE was not reporting dose to public. They were reporting data on their releases and then staff were calculating a theoretical dose to public.

So you know, the detection limit I guess on that sort of analysis is different than the detection limit that now starting in 2012, GE was submitting actual dose calculations. So if we look at GE Peterborough it looks like it has increased, but in fact it's just the nature of the calculation changed over time.

Similarly for the Toronto facility. I don't see -- I think that in general there has been a decrease over time for the GE Toronto facility.

The only other facility I see where there is a trending, I guess, is the Blind River Refinery where it went from .006 to .012, so a doubling of the public dose over that time.

These are still extremely low values. So any small change in the facility to go from 6 microSieverts per year to 12 microSieverts per year is a fluctuation amongst a very low value

and it hasn't raised a concern with the CNSC staff.

**MEMBER HARVEY:** Okay, okay.

**THE PRESIDENT:** But I read in the same data an explanation about the measurement. Any time you are off by a hundredfold, I suspect -- tell me it's not an error, a systemic error that was in there or miscalculation. I'm not sure I understand your characterization of the difference. I'm talking about the GE Peterborough.

**MR. RINKER:** Right.

So the GE Peterborough facility, it is an alteration in the way that analyses were conducted, and so the values were actually at the detectable limit. They weren't real numbers that were -- that changed by a factor of 100. It's that the type of analysis that was completed in support of the first three years was really a theoretical calculation done by CNSC staff based on the evidence they had.

In 2012 and '13 GE then began reporting its own public dose, but these are extremely, very difficult to detect numbers. So that the change you see by a factor of 100 is not

a change in something that was measured. It was a change in how things were calculated.

**THE PRESIDENT:** Wouldn't you be better in saying it's below detectable or unreliable rather than put a number on it, because it begs the question you are just hearing now?

**MR. RINKER:** I think if we had the term "below detection limit" across the column that would be accurate, but I know that the question would be, "So what is the detection limit?" And so we put the detection limit in the table.

**MEMBER HARVEY:** Yeah, but what confidence can we have in those numbers of 2013? In five years, for example, would you have the same explanation if the numbers change?

**MR. RINKER:** I'm sorry. Is this for GE Peterborough?

**MEMBER HARVEY:** Yeah, for anyone. I mean, suppose in two or three or four years there is an increase and you would say, well, it's just a matter of calculation. It's not the actual figures.

**MR. RINKER:** Right.

So in all cases it's not just a

matter of the calculation. At times it is a question of --because production rates through facilities change with time.

We know that, you know, the fuel manufacturing they moved where they were storing their fuel bundles and that there's real things that happen that cause trends. And so when you ramp up production the throughput of nuclear substances is much higher and so you would expect a commensurate change in what gets released from the facility.

So that has happened at all facilities. It's not detectable at Peterborough so you can't really see the change.

But in all facilities there has been small changes in practices that you do see from year to year, small changes in the dose calculation. However, these are still extremely low and below action level so they are not the type of changes that would say they've changed the way they operate and that's caused a direct effect. They are very small changes in how much uranium may have flowed through in any given year has caused a change in what was measured. They are still very low.

**MEMBER HARVEY:** Yeah, but would you say that the actual calculation is appropriate and won't change in the future?

**MR. RINKER:** Right. Mike Rinker, for the record.

So there is a CSA standard for the calculation of public dose and the facilities do follow that standard. So CNSC staff review the methodology against that standard of: Are these dose calculations done correctly? Are they monitoring the right kinds of things, you know, the water that people drink and soil and vegetation and air concentrations?

These are all looked at through review of inspections and also annual compliance reports to verify that these numbers are reasonable.

**MEMBER HARVEY:** Thank you.

**THE PRESIDENT:** So while we are still looking at those graphs, just an administrative question really, why are you changing formats on us?

Some of those slides, like slide 11, I like the comparison of facility by facility over the year. Just as I get used to this you

change it. In slide 14 you have put it by year. Why? And then you put it in tabular form with numbers.

**MR. RINKER:** Mike Rinker, for the record.

In general, it's for illustrative purposes because the numbers are so low. When you put a graph with many, many decimal points the data is hard to view. And if we look at -- I will pull up slide 11 -- you can see a regulatory dose limit with a red bar of one and you can still see the numbers which is observed.

If we did the same for the public dose that is here, I would put the regulatory dose limit of one and then something that is 1,000 times lower, you wouldn't see any bars.

**THE PRESIDENT:** Okay. I will accept that one.

--- Laughter / Rires

**THE PRESIDENT:** What about the next one. Does it by -- it says it's by year rather than by facility.

**MR. RINKER:** Mike Rinker.

I should caveat that as there are ways to illustrate the data better in a graphical

format, even notwithstanding the challenge that I mentioned. So we can move to a graphical format for the rest, for the next annual report.

**THE PRESIDENT:** No, no, I'm accepting your original -- for the small numbers because even if it's right to explain log scale and all this.

But, really, on slide 14 I think more interesting is facility by facility by year as you have it on slide 11. You know, it's not the year that matters. It's the trend inside a facility.

So I don't know if it's because you copied it from MOE or you created it this way.

**MR. RINKER:** Mike Rinker, for the record.

I think it's a good observation. I think probably having the facility grouped together showing an annual trend is probably an improved way to present this data.

**LE PRÉSIDENT :** Monsieur Harvey...?

**MEMBER HARVEY:** My other question is about the Vision in Motion. You mentioned in the presentation the advances into project planning and pre-licensing phases and you



mentioned 2014 and '15.

Do we have a formal agenda and what can we expect from that project?

**MR. RINKER:** Sorry. In terms of agenda the timing or the scope?

**MEMBER HARVEY:** No, the timing.

**MR. RINKER:** So we don't have anything formal from Cameco yet. From our planning purposes in general they tell us around this time of year what activities they would be doing the following year.

The last update from Cameco was that we would get an application by the end of 2014. What I understand -- and I haven't received anything formal -- is that that may shift into 2015. So I would expect an application, based on the information I have, is early 2015.

**MEMBER HARVEY:** Because if I remember that started with Vision 2000, so you've got 2000 and something.

**MR. RINKER:** Right. Mike Rinker, for the record.

That's correct and there are remediation all activities associated with Vision in Motion. Nevertheless, under their current

license they are allowed to do certain remediation activities and Cameco is -- continual improvement in terms of the status of that facility.

Now, they are not the activities that are scoped under the Vision in Motion, but I would say that Cameco is still working on the site. They are not delaying making sure that releases are as low as reasonably achievable.

**MEMBER HARVEY:** Could we have more information from Cameco itself?

**MR. MOONEY:** So it's Liam Mooney, for the record.

It's important to bear in mind that the environmental assessment was -- the approval, the ministerial approval with respect to Vision in Motion was only obtained a couple years ago. The project however is progressing, as Mr. Rinker outlined, and we continue to work closely with the Port Hope Area Initiative to ensure alignment of our schedules with theirs.

We have also had meetings with the relevant regulatory agencies; the CNSC, Environment Canada and the Ontario Ministry of Environment and some sharing of documents to progress the report, in addition to the removal

from buildings that will be demolished or modified as Mr. Rinker had outlined.

**THE PRESIDENT:** When will we get the next comprehensive update on Vision in Motion? I know it was linked to the clean-up project in Port Hope for the waste facilities and all that, but there were all kinds of other issues with the peers building and some other demolition.

When can we get a little bit more comprehensive presentation on the future?

**MR. RINKER:** Mike Rinker, for the record.

So there's two possibilities. One I can hear that generally we would just give a general status update, but you would like it more detailed. That could occur in the annual report for next year. However, if the schedule is correct and we get an application by early 2015, we will probably be before the Commission at a public hearing to authorize this project with an amendment to the license around the same time.

**THE PRESIDENT:** Okay. Thank you. Mr. Tolgyesi...?

**MEMBRE TOLGYESI :** Merci, Monsieur le Président.

I will have these first two questions to Nordion.

What will be the impact of acquisition of Nordion in public information and disclosure and community outreach?

**MR. BEEKMANS:** Rick Beekmans, for the record.

So I just want to make sure I understand the question. So you are asking the impact of the acquisition with respect to our public information program?

**MEMBER TOLGYESI:** Yes.

**MR. BEEKMANS:** So the short answer would be that there really isn't an impact. We are in the process of improving our public information program.

We have resubmitted our new protocol to the CNSC within the past few weeks and we were planning a number of upgrades and those are fully supported by Nordion management and our new owner.

**MEMBER TOLGYESI:** The question was probably what the new owner -- he has some public information programs also -- how it will impact yours.

**MR. BEEKMANS:** Rick Beekmans, for the record.

There will be no impact. So Nordion on is going to be run as a completely independent entity of Sterigenics. So our management team in Kanata will be making those decisions in compliance with our license and the CNSC requirements.

**MEMBER TOLGYESI:** And my second question is when I read page 60 of the 14-M59 CMD, before the last paragraph they are talking about Nordion and where, "...the CNSC determined that the program requires improvements to be satisfactory." Which means that at present it is not satisfactory.

When you consider the safety and control area framework when you have 14 areas, there is no reference to public information and disclosure. Should public information and disclosure be an area to evaluate or, you know, it should be just considered as a point of discussion?

**MR. RINKER:** Mike Rinker, for the record.

So in terms of Nordion's public

information program, it is not yet compliant with the new regulatory document, but it's a reasonable program. And, of note they were -- Nordion was quite proactive when there was consideration with the school board to put a school adjacent to the facility. They engaged the city; engaged the project in quite a proactive way. So I would say their public information program was reasonable.

We have placed comments on public information program for the processing facility industry partly because of the type of questions you raise. It is something that is very important to the CNSC, but it's not necessarily a safety area. It's a communication area.

So we have even done an inspection with GE on a public information program despite the fact that it is not a safety and control area. So it's overseen and regulated by the CNSC.

We have regulatory expectations, but as yet it's not something that we would rate in terms of satisfactory, below expectations in the ranking of the four, but we do have opinions on it which we express to the licensees. We have action notices. We take enforcement action and we report it to the Commission.

**MEMBER TOLGYESI:** So how the public and the licensees could consider when it comes to satisfactory level or a perception of satisfactory level also?

**MR. RINKER:** Mike Rinker, for the record. So in any safety and control area or public information program, receipt of satisfactory level means you are meeting our expectations and you are performing safely.

**MEMBER TOLGYESI:** But when we talk about safety areas, safety and control areas, you have criteria, specific criteria. What about public information and disclosure? Is there exactly the same thing?

**MR. RINKER:** Mike Rinker, for the record.

So the criteria or the clarity of our expectations is documented in a recently published, may be moving onto two years now, regulatory document. Regulatory documents are what contain CNSC criteria or expectations in order to meet our expectations. We may have --

**THE PRESIDENT:** Somebody from -- do you want to add to this?

**MS RUPERT:** Yes. Aimee Rupert,

for the record.

In Regulatory Document 99.3 there is criteria that the licensees must meet in terms of their public information program and they are very specific. So communications advisors, we then do an assessment on how the licensees are meeting those specific criteria in 99.3.

**MEMBER TOLGYESI:** Why we don't do an evaluation also and include that somewhere?

**THE PRESIDENT:** Oh, they do.

**MEMBER MCEWAN:** In a formal listing for 14 areas -- make it 15.

**THE PRESIDENT:** No, it's not -- it's not an SCA. It's a standalone under the regulatory document. Maybe you will have to elaborate what are those criteria rather than saying they are criteria.

**MS RUPERT:** Absolutely. Aimee Rupert, for the record.

The criteria are target audiences. Licensees clearly need to know who they are communicating to -- objectives that need to be measurable for their public information program.

They need to have a clearly defined communication strategy, which would



include their tools and tactics and outreach activities.

They need to also have an evaluation program on how they know that they are meeting their objectives and meeting the information needs of their community.

The last is clear documentation for all of these aspects and contact information needs to be clearly articulated on who is responsible for the program and how the public can contact.

**THE PRESIDENT:** Okay. Thank you.  
Dr. McEwan...?

**MEMBER MCEWAN:** Thank you,  
Mr. President.

The first question is related to page 40 and the internal dosimetry re-calculations that were performed. How can a systemic error like that occur in a longstanding safety program doing calculations?

**MR. RINKER:** Mike Rinker, for the record.

I will speak to it at a high level and then pass it to the Director of the Radiation Protection Division.

So it's a good question, how did that go unnoticed for a period of almost a decade, particularly when this is a program that there is a self-assessment and self-checks by the licensee and also inspection by the CNSC. My understanding, and we will get some details, is that there were some calculation errors in a spreadsheet. And this was not something that was checked until Cameco did a self-assessment and determined where the errors were.

**MS PURVIS:** Caroline Purvis, Director of the Radiation Protection Division.

A couple of things to add. So certainly when the licensee identified the appropriate method for ascertaining internal doses due to intakes, it was reviewed and assessed by CNSC experts. It was accepted subsequently and the licensees chose to use a spreadsheet with embedded formulas for the calculation of dose on an ongoing basis.

So certainly on paper the program and the technical basis for determining the doses was sound and accepted by CNSC staff. Through compliance verification activities, certainly on an ongoing basis, staff, when they did

inspections, would go in and verify how the spreadsheet was being used.

But there was no investigation in terms of looking at the calculations that were embedded in the spreadsheet. There were some quality issues, certainly quality checks in terms of ensuring that the spreadsheet hadn't been corrupted over time, but those initial design of the spreadsheet did have those fundamental errors.

Certainly, on the licensee's side of the house, they were the ones that identified the error in 2013. And they identified a number of reasons for the error having occurred, such as they did not require documented verification from the supplier that developed the spreadsheet; they didn't perform or have anyone else perform an independent verification of the spreadsheet calculations and they didn't have a tracking system to ensure that the requirement for an external expert review was complied with.

So certainly when we looked at the licensee investigation we made sure that they had identified appropriate processes moving forward. And our oversight will be different and enhanced in the future and in all these kinds of instances

where spreadsheet calculations are used.

**MEMBER MCEWAN:** So are these types of calculations based upon standardized methodology that is uniform across the industry or would each group, each company within the industry use their own developed methodology?

**MS PURVIS:** Caroline Purvis, for the record.

Certainly the internal dosimetry calculations are unique to each facility in the sense that the hazard profiles vary and certainly the methods for determining internal dose do vary from facility to facility. It would depend on the solubility of the uranium if we are talking about uranium processing facilities, for example.

Some facilities their solubility parameters will vary and, therefore, the means by which you would calculate internal dose will vary. But certainly our expectations is that the calculation methods are based on ICRP Guidelines and certain standardized methods and that they are improved over time as those benchmarks change and improve.

**MEMBER MCEWAN:** So if I read the rest of that paragraph correctly, the plan for CFM

is to introduce direct measurement? It mentions in vivo lung measurements. So they will be introducing direct measurements into that calculation rather than indirect measurements?

**MS PURVIS:** Caroline Purvis, for the record.

So as part of the investigation and the CNSC review of this event, when we looked at the historical internal doses after they had been correctly calculated, we asked Cameco to look at whether it was appropriate to be using licensed dosimetry methods for that dose pathway. Because they are already licensed for lung counting, they investigated the appropriateness of using that method.

They have submitted an application to determine internal doses to workers through the lung counting method and it is currently being assessed by our technical experts and a change to their licence is pending.

**MEMBER MCEWAN:** So that would presumably create more certainty in the measurements; more accuracy, more consistency?

**MS PURVIS:** Certainly. I can certainly say that determining internal doses due

to intakes from uranium is challenging at best. Certainly, the lung counting method that has been licensed by Cameco for use at their Blind River and Port Hope facilities, it has been tested and it is certainly acceptable to CNSC staff.

] Over time, obviously, improvements have been made and so we are confident that that method is sound. Adoption of that by CFM will certainly give us assurances that the internal dosimetry approach is acceptable to CNSC staff over the long-term.

**THE PRESIDENT:** For this round I have got two questions. The first one again is a bit administrative and it's on page 78.

So I always figured that the glossary for the layman really was to explain some technical terms. I really got stuck on -- read "Effective Dose".

--- Pause

**THE PRESIDENT:** You really don't want to give -- I don't know where you picked this up from. It's maybe from a definition of some CSA Standard or what have you. But it not only doesn't provide the actual table, it is totally incomprehensible. And the same thing for

"Equivalent Dose". So you've got to have a user friendliness idea when you put some of those things together, please.

Like, the question to SRB. Some of us remember -- I'm looking at page 69 and it is the groundwater monitoring. Some of us remember this story from way, way back. And I would like to hear what is the long term kind of a plan. I know that there was a characterization of the water flow, et cetera. Yet, I still see on the top of page 69 that 1616 Becquerel per litre. Still high.

So what is the long-term plan? I mean when is this -- will this ever get down to sort of 100 Becquerels which maybe eventually will become Ontario's drinking water? Not that I am suggesting that this is drinking water, but all I'm trying to figure out is how gradual this will improve.

Staff, why don't we start with you?

**MR. RINKER:** Mike Rinker, for the record.

Our groundwater hydrogeologist is with us today and I wonder if he could provide us

a summary. About four or five years ago the Commission asked CNSC staff to describe, do some model calculations of how that evolution of tritium in groundwater should occur over time. And Dr. Lee has been tracking groundwater concentrations in relation to that model that was done a few years ago.

**MR. NGUYEN:** Son Nguyen, for the record.

The groundwater -- tritium in the groundwater system around the SRBT facility is primarily caused by the tritium from the air disposition. So as there is the production and there is release to the air there will be some release to the soil.

The tritium concentration we see in the groundwater is primarily through the deposition of tritium into the soil. The tritium in the soil moves very slowly because of the infiltrate through the precipitation and those movements are very slow.

CNSC staff also did some calculations based on the measured tritium, available tritium in the soil, and the movement of the groundwater. The long-term prediction is that



the concentration will be around -- at the highest level around 40,000 Becquerels per litre. So those numbers change year to year. It depends on many factors, including the precipitation.

And this trend will go down only when the production stops, when the air deposition stops.

**THE PRESIDENT:** To SRBT, I noticed that the total number of people that work in the facility is increasing, which must mean business is good.

What I'm trying to figure out is the emission through the stack -- will increase or decrease over time? Do you have any plans for further controlling emissions?

**MR. LEVESQUE:** Stephane Levesque, for the record.

If you don't mind, if I could please add a little comment on the groundwater condition around the facility?

Our groundwater studies have included a number of wells, over 50 wells, including 32 wells that are within 150 metres of the facility. Those wells, since we have been drilling them between 2006 and '08 have decreased

considerably in concentration over time and it is important to note that the concentrations that we see in the wells today are reflective of historical emissions at the facility well into the 1990s.

To answer your question that you had earlier, it is expected that all these wells over time -- now, as of 2013, four of these wells are over the drinking water limit. But these wells were very localized close to the stack area and over time, including 2014 now, that's gone down to three wells. We expect over the years that there will be none that will be over the drinking water limit as the water from previous emissions gets flushed through the system.

That being said, our emissions since those years have reduced significantly to now our emissions are approximately six or seven percent of what they were in 2005, so that's -- in the 10-year period, they've reduced.

Last year, as a result of the -- to answer your second question, as a result of the closure of the SSI facility, who was one of our competitors, our emissions have -- had increased, but the good measure is the ratio of tritium

processed to the emissions reduced significantly, and even through 2014 has continued to reduce significantly where we expect that our emissions in 2014, despite processing of products three times that we used to do, will be roughly the same as they were.

So we've put initiatives in place both in staff, adding some good technical staff to help us do that, and some good processes, and we expect that the emissions will not just be at what they are, but continue to reduce over the years.

**THE PRESIDENT:** And that's exactly what my question is, whether -- you increase production, whether you will get to the point that the emission will -- the cumulative effect of increased production will increase the -- will not allow you to decrease the tritium in groundwater.

**MR. LEVESQUE:** One of the important factors that I can add is part of our emission reductions initiatives is we instituted something that we don't process in periods of precipitation. This is something that only, that we know of, our facility does in the industry.

And that's had a significant impact on concentrations on groundwater at the

surface where we're -- as opposed to in the early nineties, CNSC and SRBT were monitoring concentrations in the orders of magnitudes of millions of Becquerels per litre to now, today, we're monitoring next to detection levels somewhere to a few hundred Becquerels per millilitre near the stack.

Those numbers are just no longer possible, and you're looking at, now, numbers using the technology that we have and introducing those measures -- we're not looking at anywhere near any possible concentrations like we're finding in groundwater now.

**THE PRESIDENT:** Okay. So why -- the last question is, staff, are we now -- are you now satisfied with the financial guarantee numbers?

I know it's under review, but are we -- are we kind of satisfied with the kind of measures being taken to make them fully compliant with the requirements?

**MR. RINKER:** Mike Rinker, for the record.

So the revised financial guarantee is currently under CNSC review. We went through

one round with some comments that we made to SRBT, and they've recently responded to us in September.

I think we're very close.

**THE PRESIDENT:** Yes. Okay. Thank you.

**MR. LEVESQUE:** Stephane Levesque. Could I add to that, please?

**THE PRESIDENT:** Sure.

**MR. LEVESQUE:** To the -- I'd like to note that the financial guarantee that was approved by the Commission in 2007 has been now fully funded, all the funds according to our licence conditions, and that's been funded.

As a result of what we've seen what our competitor, who was operating a similar facility, Shield Source, we closely reviewed all their decommissioning activities and we've retained on staff a company and another consultant, those that were intimately involved directly with helping decommission the Shield Source facility. And they've incorporated their knowledge and everything they've gained from decommissioning that facility successfully into the revision of the preliminary decommissioning plan that we've submitted to staff.

And staff has responded to that revision, and we've since responded and are just awaiting comment.

So we're fully committed to meeting our obligation and having the full guarantee in place.

**THE PRESIDENT:** So just -- I can't resist.

So was it -- did you learn some good lessons from the SSI decommissioning?

**MR. LEVESQUE:** Stephane Levesque, for the record.

Yes, definitely. Actually applying actual activities that occurred have enabled us to learn quite a few things of things we didn't know were going to happen and, in other cases, things that we were over-estimating. The impact wasn't as near as what we thought, so yes.

**THE PRESIDENT:** Thank you.

M. Harvey?

**MEMBER HARVEY:** And just a question to M. Levesque.

A few years ago, there was some issues in the local community, and I'm interested to know now the current situation and the nature

of the relation you have with the community.

**MR. LEVESQUE:** Stephane Levesque, for the record. Thank you very much for the question.

I'm happy to report that I think the last inquiry that we've had at our facility from a member of the public that showed some concerns was in 2011.

Since then, that same individual was provided the information that they were looking for. We've had no inquiries from the public. Not to say that we're sitting and standing by, but we've continued to enhance our web site to provide more and more information to the public, so presuming the public's getting this information.

We've done mailings to individuals that showed concerns for the facility or sampling their wells. We keep communiques on a constant basis with the local city officials, the Member of Parliament for the province and federally.

And we've recently done a public opinion survey of homes and residences within 500 metres of the facility, so we're keeping engaged with the community a lot.

We've done a lot of plant tours, and we're hoping to continue on and improve on that in the future.

**MEMBER HARVEY:** Thank you.

**THE PRESIDENT:** Ms Velshi?

**MEMBER VELSHI:** Thank you.

A philosophical question for staff on -- so what do these ratings really tell us or what should we take away from that satisfactory or fully satisfactory in some cases over years?

As Commission Members and members of the public, should we take comfort that controls are robust and highly unlikely that anything bad would happen?

I ask that given the incident at the Port Hope conversion facility where there was almost an explosion, and how do we reconcile that because I suspect that probably showed that there was some fundamental deficiencies in the system.

So help me understand the value of what these ratings really mean, particularly as a predictor of future performance.

**MR. RINKER:** Mike Rinker, for the record.

So in general, having a safety and



control area rated as below expectations is not a sign that there's going to be issues with that facility. It's a signal that the CNSC finds deficiencies in the program and are -- have heightened -- to an unsatisfactory level and have heightened our oversight to -- placed a large burden in terms of compliance requirements and action notices or directives for the licensee to improve in order to get back to a satisfactory level.

So generally, you would see satisfactory as saying that it meets CNSC requirements. CNSC requirements are very rigorous, so having a satisfactory rating ensures that the facility is safely operating and we expect it to operate safely into the future.

A fully satisfactory is more of a recognition that the licensee is going over and above what we would expect and over and above what we see the rest of the industry doing despite the fact that the rest of the industry is operating safely.

So to get into the real example, what does it mean when see an incident like we saw at the Port Hope conversation facility, we do --

we have seen fundamental flaws in the management system. Not in the management system as a whole, but in the management system in terms of design changes when installing software in the control room.

Management system is vast compared to that, but there was an incident not -- where the person working on that system that afternoon decided to bypass the procedures that would normally be documented that would normally follow where you would say I want to do something, it's a change to the way we do things. I'm going to therefore assess the risk and get approval.

That is the management system that currently exists that Cameco follows 99.99 percent of the time except for that one incident.

But that doesn't mean that the facility is -- that that program is weak and that means that there's going to be an unsafe condition.

In fact, there are a number of physical safety systems in place that, even if that incident continued and there was an explosion, there are multiple barriers before there would be an unsafe condition.

Those were never even challenged in that case.

I think our regulatory oversight is extremely sensitive so that when something like this happens that has the potential to cause a problem within the facility, we report it publicly, now twice to the Commission, and we heighten it as an example of something that Cameco needs to improve upon.

But it's not a signal that we're concerned that that facility is going to be operating unsafe in the future.

**MEMBER VELSHI:** And so the counter to that is that we really should take a lot of comfort in these ratings and that the likelihood of anything serious happening is extremely unlikely.

**MR. RINKER:** Mike Rinker, for the record.

That's correct. Having an industry that does not have any below expectations should be a very comforting sign.

**MEMBER VELSHI:** Thank you.

So on a similar note, if I look at the Nordion set of events around their export

licence -- and I understand it's a separate licence from the isotope production one, but presumably it's the same managed system that allowed all these multiple non-compliances to happen.

How do you, again, reconcile that?

**MR. RINKER:** I'll answer that at a high level, but there's -- there may be somebody in the room who's responsible for that licence.

In general, the administrative -- we thought that they were responding to their licence conditions in an unacceptable way.

There was reporting requirements whereby Nordion is to notify the CNSC to verify that what they shipped -- once it gets through Customs and leaves the country, what they said they would ship actually was what left the country. That's a verification step.

So out of 605 occurrences, they failed to report to us within the right period 17 times.

It was raised to a level of enforcement through Administrative Monetary Penalty because there was many other ways that we tried to ensure compliance with this condition

where there was action notices, there was -- it was mentioned at a meeting that we -- you know, we expect Nordion to meet this licence condition.

But there was repeat behaviour, and that elevated the enforcement to Administrative Monetary Penalty to encourage compliance with the licence condition.

Nevertheless, throughout all instances of those shipments, there was no unsafe occurrence. It was an administrative requirement to give us confidence that what they told us they would do was verified and actually did occur.

**MEMBER VELSHI:** But what I'm hearing, though, is so there was the non-compliance and then there is a dismissal of the regulator's warnings that you need to fix this.

So doesn't that imply that there's something wrong with the culture that would do that?

**MR. RINKER:** Mike Rinker, for the record.

They're not hearing us. An Administrative Monetary Penalty is designed to encourage compliance, and so I think they heard us this time.

**MEMBER VELSHI:** I'd like to hear Nordion's perspective on this, please.

**MR. BEEKMANS:** Yes, thank you. Rick Beekmans, for the record.

Nordion has taken this matter very, very seriously and we've done a very detailed investigation that has resulted in a number of corrective actions.

We've submitted a report to the CNSC which has the results of our investigation and the corrective action described. There are 10 corrective actions that we have recommended, eight of which have been fully implemented and two of which are more longer term where we're looking at a more systematic way to manage the administrative steps that need to happen when we're moving Cat 1 and Cat 2 material.

I would like to comment a little bit on the note that you had made about, I guess, a breakdown.

So I guess from Nordion's perspective, quite frankly, we were caught a bit by surprise, so we are in ongoing communications with all our counterparts at CNSC. We were audited in 2014 and previously in other years in

this specific area, and there were findings. This is accurate.

We take fully responsible for the 17 non-compliances that were identified. Many of those were identified previously, in previous audits, and the communications that we had during those periods with the CNSC was that our performance was described as excellent.

So I would say that -- and what I've described, the situation as -- you know, we've experienced a recalibration, and it's not something that we want to happen again.

We don't want that type of recalibration to occur. We understood from the way that we were addressing the items in the past that the actions that we'd put in place were satisfactory and our performance was satisfactory.

But from here on in, our expectations will be zero.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** If I can add some colour to this, this is both sides of the regulatory and the licensee are at fault here, and it's a classic example where they were talking to each other at operating level. Both management in

Nordion and both management in CNSC were not aware, so we had to take some corrective action also at CNSC.

Seventeen (17) times for this to occur, both sides are at fault, so just so you know that we at CNSC, I think, from staff perspective had to review their own procedures as to when you escalate this to senior management.

Anything else?

M. Harvey?

Mr. Tolgyesi?

**MEMBER TOLGYESI:** Merci, monsieur le président.

Turning to page 30 on the report regarding worker doses at Port Hope facility, you are saying that in the Figure 2.9, which is on the right-hand side, the average doses were relatively stable at two millisieverts except 2013 due to inclusion of contractor nuclear energy worker dose statistics which decrease the average dose.

What it means, that? It is a kind of new way of calculating, adding nuclear energy workers for 2013 only or it was not there before or it will be like this in the future?

**MS PURVIS:** Caroline Purvis, for



the record.

In the past, the contractor dose information was certainly provided to CNSC staff through annual compliance reports, but the statistics that were reported for effective dose and were presented in the past to the Commission did not include contractors. It only included employees of Cameco.

This year, we clarified our expectations with respect to the handling and the reporting of contractor effective doses.

In this particular circumstance, it was significant because the number of contractors at Port Hope was 338 individuals out of -- in comparison with 485 employees, so it was significant. It was a significant number of contractors, and we felt it was appropriate that the licensee, from this point forward, start reporting those and that we would also represent the data more appropriately for your consideration.

**MEMBER TOLGYESI:** And what about -  
- because you don't talk about this in other facilities. You don't mention that they are included or excluded.

Does it mean that probably they are not or they are, but they are not a significant number?

**MS PURVIS:** I can certainly provide for each facility when they're included and when they're not, but this particular circumstance for this licensee was the sheer numbers that were really skewing -- skewing the data, and we felt it was appropriate.

Would you like the breakdown, or -- certainly I can provide it. It isn't specifically mentioned, but most of the licensees include contractor doses.

**MEMBER TOLGYESI:** No, just I wanted to know because there is no mention in other place or other facilities.

**MS PURVIS:** Yes.

**MEMBER TOLGYESI:** So I didn't know where is that.

So -- but you are saying that in other facilities, it's included.

**MS PURVIS:** If the contractors are nuclear energy workers. That is -- as a reminder, the statistics presented in the CMD are for NEWS. They are included.

**THE PRESIDENT:** Dr. McEwan?

**MEMBER MCEWAN:** Thank you, Mr. President.

I wonder if I could have a question for both GE and staff on the soil contamination.

You quoted some data, and I think I copied it down correctly, 3.2 average surface, 5.5 at depth, micrograms per -- I wasn't sure what unit. You didn't give any data on background. You didn't give any data on comparable samples outside of the contaminated area.

And then you said you -- based on that, you really didn't think you had to do anything.

So I remember that our initial conversation around this was not in the most helpful of environments when we first talked about it.

But could you sort of expand on that a little bit and explain why you feel that it's okay to leave this, and do staff agree?

**MR. MASON:** For the record, Peter Mason, GE Hitachi.

Yes. If we give some background

to it and the Toronto facility, around the property, both at perimeter and the community, we take 49 samples. And of those samples, they were all well within the limits, in fact, very close to background levels except this one area, which is on the CP Rail property adjacent to the fence at the back of our property, where the sampling showed slightly elevated levels compared to all of the others.

And some concern was raised by certain individuals, and we committed to -- although it was well below the required levels, we committed to take a look at that, which we did do.

As I mentioned earlier, we had a third party, a company called Trinity, take 18 samples. And the area concerned was a three metre square area on the CP Rail property.

They took samples on the surface and they took samples at depth.

The maximum concentration on the surface, I believe, was 6.2, I believe. The average on the surface of the three metre square area was 3.2 micrograms per gram, or parts per million.

At depth, the maximum was 12.2

parts per million, and the average was 6.2 parts per million.

If we think the ambient or the background level of uranium in Canada which one could find in one's back garden is anywhere from zero to 4 parts per million, if we look at the CNSC's own limits of 23 micrograms per gram for park and residential and 33 micrograms per gram for commercial and industrial property and if we also take into consideration that this property is private property belonging to CP Rail, fenced off from the public, our legal counsel advice was that -- and I think CP concurred with it -- is that we should not take any remediation action. Otherwise, it would set a precedent for remediation of all sorts of property all over the country.

You know, it would also undermine the limits that have been set for both residential and commercial/industrial properties. Otherwise, one would think that we would have to reduce the limits to those sort of levels.

So all in all, it was considered prudent not to take any action to remediate that small patch of property.

**MEMBER MCEWAN:** So what would the measurements be for other parts of the site? And I think that there are also sort of streets or parks somewhere near the plant are also sampled. How would they compare? You gave sort of national averages rather than...

**MR. DESIRI:** For the record, Paul Desiri.

So all of the samples, and Mr. Mason mentioned that we do 49 samples in total, all the samples in residential areas are within background levels.

**MR. MASON:** For the record, Peter Mason.

And I think it was concluded at the December meeting by the Ministry of Environment actually which had concurred with our sampling, that there was no reason for further action. And I think after 55 years of operation in the area, it showed that we were operating without any impact on the environment.

**MEMBER MCEWAN:** Staff?

**MR. RINKER:** Mike Rinker, for the record.

So this is something that GE

Hitachi Canada has been working on throughout the year. And the update provided today to the Commission is also an update to Staff. So some of this information is quite recent.

Just, you know, a small correction. The Ontario typical range for uranium is likely less than 2 ppm, notwithstanding the criteria that Port Hope uses for cleaning up the town is if it is lower than 23 parts per million it is not something that would need to be remediated throughout that Port Hope area initiative. There is other constituents, arsenic and others, that may exist in Port Hope that could trigger cleanup.

But in terms of uranium, if it is lower than 23 in a residential area, it would not require remediation. And here, we are talking about a small area along the fence line that borders between the facility and the rail line. So the potential for exposure for children and so on just doesn't exist.

So it is a small area, the concentrations are low. It is not something that we have a regulatory concern with at this point.

**THE PRESIDENT:** So we agree with

the recommendation, no action necessary?

**MR. RINKER:** Mike Rinker, for the record.

Based on some validation that the data that they are discussing today is correct, likely yes.

**THE PRESIDENT:** Did we do our own -- did CNSC do its own validation?

**MR. RINKER:** Mike Rinker, for the record.

CNSC has done its own data collection even in that area. We were not requiring cleanup. It was more of a response to the social concern at the meeting of last year that this was initiated.

**THE PRESIDENT:** Okay, thank you.

**MEMBER VELSHI:** Just before we leave this one, not that I am questioning your decision on this, I just wondered is this something you would have consulted your community liaison committee on, your decision not to do any remediation?

**MR. MASON:** For the record, Peter Mason.

No, we did not, and we wouldn't



tend to either.

**MEMBER VELSHI:** I ask that given the level of concern that was evident at the meeting last year, given that they are almost your ambassadors in the community.

And if they have got the facts and the rationale for the decision, would that not help you in laying this unfounded concern that --

**MR. MASON:** For the record, Peter Mason.

From the feedback we got from parents and the residents who actually live in the area, they were satisfied by the results of our sampling that we take in the residential area.

I think if you refer back to the December meeting when this action item came up, it was rather a concern that was pursued by certain activists, not by the residents of the area.

**THE PRESIDENT:** But it is one of the five action items that you committed to do. And just to close the file, I assume you would put somewhere on your website that you have done the samples, et cetera, reached a conclusion there is no issue. And that would close that particular action item.

**MR. MASON:** For the record, Peter Mason.

I think that is a very good idea. We could certainly do that so that the residents are informed of what we have done and what we found.

**THE PRESIDENT:** Member Harvey?

**MEMBER HARVEY:** First, on page 34, it is about the pumping of contaminants at the Port Hope Conversion Facility.

We can see on the table there that the mass pump has increased. But how can we be sure that there is no more leakage? Because we don't know exactly the mass of contaminants on the ground. And as part of the fact that we increase the total mass pump, this is not to say that there is no leakage.

So do you have other means by which you can verify that there is no leakage?

**MR. RINKER:** Mike Rinker, for the record.

I think your question is getting to can we confirm that there are no more releases from the facility to contribute to groundwater?

**MEMBER HARVEY:** Right.

**MR. RINKER:** So there was source identification when groundwater contamination was discovered back about six years ago.

And so the floors of some rooms were cracked and there was leakage around them. Now, those have been remediated. But there is an inventory of contamination in soil below some of the buildings.

And so to distinguish between -- like, from the monitoring well, to distinguish between something new and something from the soil is not possible, you just see it.

However, it is responding more or less the way we anticipate based on the residual soil contamination. From inside the buildings and from inspection we don't see any -- we are looking for it of course now that we realize there is a problem, we don't see any other potential sources to groundwater that we are not aware of.

Is it impossible? No.

Is it possible that there is another source that we just haven't seen? I can't rule it out, but we don't see anything and we do look for it.

And finally, with the Vision in

Motion project, the remediation scope of that project is -- Cameco has certainly indicated to us and indicated to members of the public in Port Hope that that is not going to change and that they are going to be doing additional soil remediation in and around that facility. That should greatly improve the situation.

**MEMBER HARVEY:** Thank you.

**THE PRESIDENT:** I got three quickies here.

Page 62 on the SSI facility decommissioning. You are putting in some of those numbers. But, you know, those numbers without context saying, okay, I can now eat those apples, are really meaningless to the public if you like.

Would be nice if we came up with a chart that says that they are releasable -- you know, this property is now releasable to the public because of those values, rather than abstract that don't mean anything to us.

**MR. RINKER:** Mike Rinker, for the record.

This is extremely high-level presentation of what we know about the status of the environment at Shield Source.

We are working on a document that better summarizes all of the data we have collected, the state of the environment, it is going through the approval stages now with the anticipation to release it to the public so that they can have a more fulsome understanding of the concerns you have mentioned.

**THE PRESIDENT:** Okay. That will be good.

On page 25, I saw a couple of times in their presentation the ISO 14001, and they conduct periodic audits. Can somebody talk to us about what are they auditing and how useful it is, and what is the follow-up?

**MR. RINKER:** Mike Rinker, for the record.

We will ask Mike Jones, a specialist in our environmental compliance division.

**MR. JONES:** Hello, Mike Jones, for the record.

ISO 14001 is environmental management system program that is applied at sites throughout the world.

And an audit of the program

basically is looking at the various components that are required within the programs, just having an environmental policy, having proper staff assigned to manage the system, having the proper procedures in place, having the monitoring programs we currently have at the locations, such as an effluent monitoring program and an environmental monitoring program, and then taking that through to the end where there will be internal audits as well as they review the management system in place at the facility.

**THE PRESIDENT:** So do we get to see them or just purely to the licensee?

**MR. JONES:** Mike Jones again.

The audits conducted by the licensees are conducted at their facilities. We can see them I believe upon request. In the past, we have done our own audits of these programs and we have started, instead of doing EMS audits, doing Type 2 inspections of the program so we can validate the various components of the environmental programs ourselves.

**MR. RINKER:** Mike Rinker, for the record.

An environmental management system

is a specific area under the environmental protection safety and control area. So the CNSC, when we do an environmental protection inspection, we look at the licensee's environmental management system. Part of that is to see if they are up to date in terms of the certification and what is happening there.

Certification doesn't exactly mean it definitely meets our requirements, but it may and then likely does. But we do inspect the licensees paperwork to make sure that they are fully compliant.

**THE PRESIDENT:** I notice that everybody is using that as a badge of honour, so to speak, that you certify, you know, and do those audits. So we never spoke about how do they compare to the kind of review and audit that you do and whether they are useful at all.

**MR. RINKER:** Mike Rinker, for the record.

We have a regulatory document under environmental protection for requirement for environmental management, and specifically referencing ISO certification could help meet our expectations.

**THE PRESIDENT:** So Cameco, particularly when the Blind River -- so you get asked to go in there, you get the ISO people to go in there, and then you get the IAEA to do five audits.

So are they are useful? That is a leading question. Cameco, do you want to tackle that?

**MR. MOONEY:** It is Liam Mooney, for the record.

And I think that there is some synergies that could be put in place around some of those various activities. I know internally we have looked at the registration for the individual sites and looking at moving to a corporate registration, given that almost all of our facilities are ISO 14001 registered. That is a big part of the discussion there.

The IAEA of course is looking at from a security and safeguards side of things, which is a separate conversation, but nevertheless it does give you some visibility on the frequency on audits and inspections that our facilities are subjected to.

**THE PRESIDENT:** Does CNSC Staff



get to see the IAEA audit?

**MR. MOONEY:** Sorry, it is Liam Mooney, for the record.

I believe so.

**THE PRESIDENT:** It is for Staff.

**MS OWEN-WHITRED:** Thank you. For the record, my name is Karen Owen-Whitred, the Director of the International Safeguards Division.

The answer is yes, after every IAEA inspection we get a statement back from the agency that indicates at a fairly high level success or failure essentially.

On a working level, we are in constant communication with the IAEA in case there are any issues that they have determined during the course of their inspection that we can work on in terms of an ever improving compliance perspective.

**THE PRESIDENT:** Just this again, one of those questions. Five times in a year to Blind River?

**MS OWEN-WHITRED:** I am sorry, what was the question?

**THE PRESIDENT:** Why is it five times audit or inspection by IAEA in Blind River?

**MS OWEN-WHITRED:** Sir, generally speaking, the frequency of inspection at uranium processing facilities in Canada, as conducted by the IAEA for safeguards, follows a procedure that is developed amongst the three parties, so namely the CNSC, the IAEA, and in this case Cameco had a part in that as well.

It is based on a risk-informed approach that is randomized inspections that take into account the type and quantity of material. And we have moved generally from -- in the past we were based -- the IAEA was based on a fairly rigid system of inspections whereby in advance they were scheduled and there was what we consider to be a fairly high level or large number in other words.

We have moved from that to a randomized system of inspect that are more short-noticed or even unannounced in some cases. The idea is that the IAEA can implement fewer number of inspections and yet retain the same confidence in their evaluation.

This is not, however, expected to continually decrease the number of inspections in any given year. It is based on their annual analysis of the entire Canadian picture. And so

you will of course see in some years more inspections and in some years fewer inspections.

We have, within the procedures that I had mentioned earlier, there is kind of a minimum number of inspections per year. But in any given year those can go to a higher number based on the IAEA's analysis and their inspection plan essentially that they put together on an annual basis.

**THE PRESIDENT:** Dr. Jammal?

**DR. JAMMAL:** Ramzi Jammal, for the record.

I am not going to comment to anything else besides our specialist, Karen, with respect to the IAEA.

However, one thing I would like to clarify, the fact that the badge of honour of the ISO 14000 for laboratory compliance does not replace our regulatory requirements, it compliments the regulatory requirements.

So, as Mr. Rinker said, we have our regulatory requirements that the licensee must meet. But our inspectors, when they go on site, they do review the audit results and make sure if there are any actions or recommendations arising

from the audit is being taken into consideration and being implemented by the licensee.

So it is a badge of honour for the licensee from their perspective for marketing purposes or whatever it is going to be. But our regulatory requirements is specific to that site according to the licence conditions. So both compliment each other.

But the question is, do we see the results? The answer is, yes, we do review the results and our inspectors that are on site do review the results.

**THE PRESIDENT:** Okay, thank you.

Any final last question, observation? Anybody want to say anything, final word?

Okay, thank you. Thank you all.

We are going to break now for -- we will come back at 4:00.

--- Upon recessing at 3:42 p.m. /

Suspension à 15 h 42

--- Upon resuming at 4:04 p.m. /

Reprise à 16 h 04

**CMD 14-M58 / 14-M58.A**

**Oral presentation by CNSC staff**

**THE PRESIDENT:** Okay. Are we ready to go?

The next item on the agenda is the CNSC staff report on the performance of uranium mines and mill facilities: 2013. This is outlined in CMD 14-M58 and 14-M 58.A.

The public was invited to comment in writing on this item and the Commission received two written submissions. We have a representative from Cameco Corporation and AREVA Resources Canada Inc. joining us by videoconference from Saskatoon and they are available for questions after the presentations.

Also in Saskatoon is Mr. Tim Moulding from Saskatchewan Ministry of Environment. So before we get going, let's test the technology.

Saskatoon, can you hear us?

**MS EATON:** We can. Tim Moulding, unfortunately couldn't join us, so he's not here.

**THE PRESIDENT:** Okay. I also understand that Dr. James Irvine is joining us via

teleconference.

**DR. IRVINE:** I am actually in the Saskatoon CNSC office now.

**THE PRESIDENT:** Oh, great. Thank you for that.

So I will turn the floor now to Mr. Newland for the presentation.

**MR. LEBLANC:** If I may, Mr. President, is there anybody else from the Saskatchewan government in the room or was --  
--- Off microphone

**MR. LEBLANC:** Mr...?

**MR. McCULLUM:** Mr. McCullum.

**MR. LEBLANC:** Yes. Thank you, Mr. McCullum, from the Ministry of Economy, I think.

**MR. LeCLAIR:** I'm sorry, let me get a few things clarified.

So from Saskatoon, Sarah, could you please have everyone around the table quickly introduce themselves so the Commission Members will know who are in the room in Saskatoon, please?

**MS EATON:** Sure. So I'm Sarah Eaton, I am a CNSC Project Officer.

**DR. IRVINE:** James Irvine.

**MR. MOONEY:** Liam Mooney.

**MR. NAGY:** Kevin Nagy.

**MS VAN LAMBALGEN:** Tammy  
Van Lambalgen, AREVA.

**MR. HUFFMAN:** Dale Huffman with  
AREVA.

**MR. RICHARDS:** Jack Richards with  
AREVA.

**MR. CORMAN:** Jim Corman with  
AREVA.

**MR. CUNNINGHAM:** Keith Cunningham  
with the Ministry of the Economy for Saskatchewan.

**THE PRESIDENT:** Thank you.

Mr. Newland, go ahead.

**MR. NEWLAND:** With that, good  
afternoon, Mr. President, Members of the  
Commission once again. My name is David Newland  
and I am the Acting Director General of the  
Directorate of Nuclear Cycle and Facilities  
Regulation.

With me today are Mr. Jean  
LeClair, Director of Uranium Mines and Mills  
Division and Mr. Mark Langdon to his left. Mark  
is the supervisor of the Uranium Mines and Mills  
Division.

We also have CNSC staff involved in this report here in Ottawa and also joining us today in Ottawa is Mr. Kevin McCullum from the Saskatchewan Ministry of the Environment.

By teleconference from Saskatoon we also have Uranium Mines and Mills Project Officers. Also connected from Saskatoon by video conference are the licensees, representatives from Cameco and AREVA.

We are here today to present Commission Member Document CMD 14-M58 entitled CNSC Staff Report on the Performance of Uranium Mine and Mill Facilities: 2013.

And with that I will now pass the presentation over to Mr. LeClair.

**M. LECLAIR :** Bonjour, Monsieur le Président et Membres de la Commission. Mon nom est Jean Leclair. Je suis directeur des Mines et Usines de concentration d'uranium de la Commission canadienne de sûreté nucléaire.

Si vous pouvez vous imaginer le nombre de fois que j'ai dit ça pendant les quatre dernières semaines à Québec, aux audiences du BAPE. Je me suis beaucoup pratiqué. Par contre, je vais m'exprimer en anglais tout simplement pour



le bénéfice des gens qui sont anglophones.

So on that note I would like to start off perhaps by noting a correction on one of the tables that was in the staff CMD. This is on Table 2-5 on page 22.

In doing a review of the table we noted that there were three transcription errors in the table that have been corrected and are provided here so that they are on the record. You can see the three numbers on the left as they were submitted and the revised numbers on the right. Please note that the corrected values do not make a difference to the conclusion and still show that the values are well below the license discharge limits.

Our presentation today will first consist of an overall introduction. We will quickly go over the content of the report, provide you an update on external events particularly with regards to Fukushima, as well as a recent event at the Allan Potash Mine in Saskatchewan with regards to an underground truck fire.

We have another CMD presentation that is planned for later on Mount Polley so we won't discuss that in this presentation. We will

be covering that off on a standalone item.

We will also provide a quick update on a few projects that may be of interest to the Commission; namely the Kiggavik Project, the Millennium Project, as well as the Gunnar and Lorado decommissioning project.

We will provide a general description of the performance for each of the facilities, followed by specific information for the five operating facilities.

It is interesting to note that for uranium mines and mills over the last two years all of the operating mines and mills have been brought forward to the Commission for either license amendments or license renewals. McClean Lake was in December of 2012, Cigar Lake in April of 2013, McArthur River, Rabbit Lake and Key Lake in October of 2013.

So some of the data that we will be presenting today has been presented previously to the Commission either as part of those license hearings and also as part of last year's annual report.

I would now like to pass the presentation over to Mark Langdon.

**MR. LANGDON:** Thank you, Jean.

Good afternoon, Mr. Chairman and Commission Members.

My name is Mark Langdon and I am the Supervisor of the Uranium Mines and Mills Division.

The Canadian Nuclear Safety Commission regulates Canada's uranium mines and mills to protect the health and safety and security of persons to protect the environment to ensure that Canada continues to implement its international commitments on the peaceful use on nuclear energy and to disseminate objective scientific technical and regulatory information to the public. This is accomplished by CNSC staff to a risk-informed compliance program of verification, enforcement and reporting.

On the right side of this slide are listed the 14 safety and control areas on which CNSC staff assess the licensee's performance against set criteria, regulatory and license requirements, performance objectives and CNSC staff expectations.

This report provides performance information for the 2013 calendar year. It

includes CNSC staff's assessment of the licensee's overall performance and includes information on significant events, developments and license changes. The report also provides five-year trend data and some performance comparisons to other mining sectors.

The report focuses on the performance data on the three safety and control areas of radiation protection, environmental protection and conventional health and safety.

I would like to highlight some new information additions that are within the 2013 report. We have added information to the report relating to contaminant releases to the atmosphere from the uranium mines and minerals, reclamation and decommissioning timeline estimates and the country foods assessments by the Eastern Athabasca Regional Monitoring Program 2012.

Finally, we have included spill rating definitions of high, medium and low which CNSC staff now apply to all spills to provide a sense of significance to each spill reported.

The CNSC is committed to ongoing continuous improvement, taking into account current events and lessons learned from both

nuclear and non-nuclear sources. Lessons learned from the Fukushima event are provided and a discussion on power loss and communications at uranium mines as a lessons learned, resulting from the Allan potash mine fire, is presented.

A separate presentation is planned for later today, as Jean has told you, to discuss the breach of the tailings pond dam at the Mount Polley mine in British Columbia.

As a result of the tsunami and resulting Fukushima nuclear power plant accident, the CNSC developed an integrated action plan. Uranium mine and mill facilities were required to re-examine the safety cases and report on implementation plans for short-term and long-term measures to address any gaps discovered.

Licensees conducted formal reviews of their emergency preparedness and response plans at their northern Saskatchewan facilities, including multiple natural disaster scenarios such as a forest fire and power outage. These reviews confirmed the appropriateness of the programs implemented to protect the health and safety of people and the environment during potential natural disaster situations.

CNSC staff reviewed the licensee's reports and verified their conclusions that the underlying defence-in-depth controls were in place to deal with natural disasters and severe accidents and confirm that the facilities were operating in a safe manner and continue to make improvements as part of ongoing operations. There are no remaining or outstanding actions for the uranium mine and mill facilities.

On September 10th, 2014, a fire occurred at the Allan potash underground mine in Saskatchewan, resulting in power loss and communication issues. A lessons learned topic resulting from the Allan potash mine fire is the ability for communications in underground mines in the event of power loss.

This slide and the next one review emergency preparedness with respect to power loss and communications at uranium mines and mills. Facilities have emergency preparedness and response programs and specific emergency response plans in place to prevent and mitigate the impacts of potential crisis situations. Each facility has qualified emergency response teams to respond in the event of emergencies. These teams undergo

rigorous hands-on training.

Mutual aid agreements are in place with other northern sites providing additional mine rescue support when necessary. In the event of an underground emergency such as a fire, stench gas that smells like rotten eggs is released into the underground ventilation system to notify workers to immediately report to an underground refuge station.

These refuge stations are strategically located throughout the underground. Each refuge station is equipped with a supply of breathable air, potable water, food, lights, first aid supplies, sanitation facilities, firefighting equipment, sufficient seating for the number of workers expected, and effective means of communication with surface.

Refuge stations are positively pressured and ventilated with surface air. Surface compressors that supply this air can be operated on backup diesel power in the event of a site power outage. The refuge station is also equipped with backup air supply from oxygen cylinders, as well as battery-powered carbon dioxide scrubbers to ensure breathable air supply.

Uranium mine refuge stations are equipped with three methods of communication. Telephones are strategically located at underground locations, including within refuge stations. The majority of underground workers carry hand-held battery-operated radios. Refuge stations are equipped with battery-operated fixed radio communication.

The leaky feeder antenna system underground requires low-voltage so it would require either primary or backup power to operate. Femco telephones are self-contained battery power communication devices that are located in the refuge stations to provide additional backup means of communication with the surface in the event of power loss.

Facilities are connected to the provincial electrical power grid and are equipped with backup diesel electrical power generators. In the event of power outage, generators can provide backup power sufficient for essential services, including communication, ventilation and shaft operations until permanent power is restored.

Both Cameco and AREVA have



conducted emergency exercises that simulate a loss of power to the operations, including evaluation of communications to ensure response teams are adequately prepared. On surface, facilities also have cellular telephone coverage and satellite telephones available for emergency use. CNSC staff are satisfied that communication devices available at the uranium mines and mills in the event of power loss are sufficient.

This slide provides a brief updates on other uranium projects under review. For the Kiggavik Project, AREVA plans to submit its final environmental impact statement to the Nunavut Impact Review Board in the fall of 2014.

For Cameco's Millennium Project in Saskatchewan, in May 2014 Cameco wrote to the CNSC to withdraw their application for a construction and operating license citing unfavourable economic conditions. Cameco will continue to do some limited work to be in a position to resubmit their application should market conditions change.

The legacy Gunnar Project is the clean-up and decommissioning of the former Gunnar Mine that operated from 1955 to 1963 in northern Saskatchewan. Environmental assessment and

licensing will be presented to the Commission for a decision in November 2014.

The legacy Lorado Project that operated from 1957 to 1960 had a CNSC license issued in 2013. Phased reclamation work is ongoing and is expected to be completed by the end of 2015.

The next few slides will be discussing the safety performance at the uranium mines and mills.

There are currently five operating uranium mine and mill facilities in Canada, all located in the Athabasca Basin in northern Saskatchewan. Cameco operates Cigar Lake, McArthur River, Rabbit Lake and Key Lake, while AREVA operates McClean Lake.

This slide displays the license issue dates, license expiry dates and license terms for the facilities. Commission hearings were conducted in 2013 for the relicensing of the four Cameco facilities. AREVA's McClean Lake operation had a Commission hearing for a license amendment in December 2012.

The ratings for each safety and control area is based on the licensee meeting the

regulatory requirements as assessed through CNSC staff compliance and licensing activities. The level of staff review for each safety and control area takes into consideration the facilities' specific activities and the risk that these activities comprise.

All operating uranium mine and mill facilities received a satisfactory performance rating for 2013. To ensure licensees provide open and transparent information to the public, in 2012 the CNSC published new regulatory requirements in regulatory document 99.3, public information and disclosure.

As part of regular outreach activities, CNSC staff participate in community meetings, environmental quality committee meetings, site tours, northern tours and CNSC 101 events. Additionally, the CNSC shares information through the CNSC website and CNSC online.

This slide shows the number of inspections conducted in 2013 and the resulting action notices for each facility. Please note, CNSC staff also issue recommendations during inspections for continual improvement. The 21 action notices issued have all been closed to the

satisfaction of CNSC staff.

The graph on this slide shows the maximum individual effective radiation doses for uranium mine and mill workers from 2009 to 2013. The red line on this chart displays the effective dose regulatory limit that a nuclear energy worker can receive any year. As you can see, the highest dose received by an individual worker in each of these facilities was well below the annual dose limit of 50 mSv.

As part of routine and focused compliance inspections, CNSC staff verified and confirmed that licensees have effective radiation protection programs to monitor and control radiation exposures. Consistent with the principle of ALERA, CNSC staff conclude that licensees continue to work at reducing worker exposures.

As previously mentioned, air quality monitoring data has been added to the 2013 report. Facilities measure ambient air quality around each operation utilizing the following methods:

High-volume air samplers collect particulates from the atmosphere. Particles can

also be analyzed for metals and radionuclides. Radon track- etched detectors passively measure the radon concentrations in the air over time.

Particulates in the air are deposited on soil and vegetation which can then be analyzed to verify acceptable operational conditions and ambient air is monitored for sulphur dioxide to ensure acceptable levels.

Uranium mills with yellowcake dryers, calciner operations and acid plants have air stack emissions that are also monitored.

As part of regular compliance activities, CNSC staff remove air quality data to ensure that the health and safety of workers in the environment are protected.

This slide demonstrates the track-etched results showing radon concentrations in ambient air in 2013. 60 Becquerels per cubic meter reference level has been derived from the *Radiation Protection Regulations* and approximates to the 1 mSv per year regulatory dose limit for members of the public. As you can see on this slide, radon concentrations in the ambient air at all facilities are well below the reference level of 60 Bq per cubic meter.

Suspended particulates captured in the air -- the high-volume air samplers are analyzed for metal and radionuclide concentrations. Shown on this slide are concentrations of lead 210, radium 226, thorium 230 and uranium which are well below the reference to air quality levels.

In conclusion for air quality monitoring, all facilities conduct regular air quality monitoring to demonstrate that environmental impacts remain within acceptable levels. Facilities demonstrate strong performance mitigating and monitoring atmospheric effects on their operations on the environment. CNSC staff conclude that for atmospheric releases the environment is protected.

Historically at the uranium mine and mill facilities, selenium, uranium and molybdenum were identified as constituents of potential concern. As a result, licensees were required to improve engineering controls and treatment technologies to reduce effluent concentrations of these contaminants. For all five facilities in 2013, concentrations of selenium and treated effluent remain below the

provincial limit of .6 milligrams per litre.

Concentrations of uranium and treated effluent were well below both the provincial limit of 2.5 milligrams per litre and CNSC's internal objective of 0.1 mg per litre and concentrations of molybdenum and treated effluent were well below the McArthur River action level of 1 mg per litre.

CNSC staff are satisfied that treated effluent annual average concentrations were below licensed limits.

This slide shows the comparison of uranium mines and mills effluent quality to four other mining sectors across Canada from 2008 to 2012. The table provides the percentage of mines and mills in each mining sector that were in compliance for each year.

For a mine to be in compliance their effluent must have met all of the regulatory effluent release limits of the *Metal Mining Effluent Regulations* for contaminant concentrations of arsenic, copper, lead, nickel, zinc, total suspended solids, radium 226 and pH for the entire year. For example, if a sector had a 50 percent compliance rating this would mean

only half of the facilities in that sector met all of the requirements for the full year.

As shown, the uranium mines and mills sector achieved an 80 percent compliance rating for the 2012 year due to one regulatory effluent exceedance when pH and total suspended solids levels exceeded licensed limits at the McArthur River operation. This exceedance is further discussed in the 2013 report.

Lost-time incident statistics are a key measure of licensee performance. The 2013 statistics demonstrates satisfactory performance in keeping workers safe from occupational injuries. CNSC staff confirmed that the licensees provide effective oversight of health and safety.

Appendix F contains the timeline estimates of major reclamation and decommissioning activities for each of the five mine and mill facilities as prepared by the licensees. An example is shown on this slide as Key Lake. The timelines provide an estimate of the mine or mills' life based on current reserves, future production estimates and a general reclamation and decommissioning plan. It is important to note that the timelines are estimates and are subject



to change over time.

The Eastern Athabasca Regional Monitoring Program monitors the safety of traditionally-harvested country foods, including water fish, berry and mammal chemistry from representative communities located in the region.

CNSC staff conclude that the radiological dose received from consumption of country foods is below the public dose limit and is not a concern to human health. CNSC staff agree with the provincial human health risk assessment of 2013 which confirmed that country foods assessed were safe to consume.

Now, I'm going to discuss the Cigar Lake operation. Cameco's Cigar Lake operation is the world's second-largest known high-grade uranium deposits. The picture on the right shows the surface facilities at the Cigar Lake mine. In December 2013 the first ore cavity was excavated using the jet bore system. Commissioning of ore production continues today, along with continued development of ground freezing. High-grade uranium ore slurry will be transported to McClean Lake for milling. There are no tailings facilities at Cigar Lake.

Radiation doses to workers at Cigar Lake in 2013 met regulatory limits and were ALARA. There were four lost-time incidents in 2013. CNSC staff observed Cigar Lake efforts for continual improvement in health and safety through the transition from construction to operational activities.

In 2013 CNSC staff observed the treated effluent parameter concentrations were below regulatory limits. Cigar Lake had two environmental spills which were remediated with no residual environmental impacts. Air monitoring shows environmental impacts were negligible. CNSC staff conclude in 2013 that the health and safety of workers and the environment were protected at the Cigar Lake operation.

Now I will discuss the McArthur River operation. McArthur River operation is the world's largest high grade uranium mine. The picture on the right shows the surface facilities of the McArthur River mine.

Cameco's McArthur River operation continued to focus on underground and freeze development. High grade ore production produces an ore slurry that is transported to Key Lake for

milling. There are no tailings facilities at McArthur River.

In 2013 radiation exposures were controlled and doses kept ALARA. There were no lost-time incidents and CNSC staff observed a strong focus on accident prevention.

In 2013 CNSC staff observed that contaminant concentrations in treated effluent were below licensed limits. At McArthur River there were two environmental spills which were remediated leaving no measurable impacts to the environment. Results of air monitoring shows environmental impacts were negligible and CNSC staff are satisfied that McArthur River continues to protect the health and safety of workers and the environment.

Now, for Rabbit Lake operation. Rabbit Lake has been in operation since 1974 and is both a mine and a mill. The picture on the right shows the mill facility at Rabbit Lake.

Cameco's Rabbit Lake operation continue to operate its mill and underground mine in 2013. Based on results of ongoing exploration activities, Cameco expects the Eagle Point Mine to operate until at least 2018. Reclamation

activities continued in 2013 and Rabbit Lake continues to operate an in-pit tailings management facility.

Rabbit Lake also has an above ground tailings management facility which has not received any tailings since 1985.

At Rabbit Lake in 2013 radiation doses were kept below regulatory limits and as low as reasonably achievable. There were no lost-time incidents and CNSC staff observed effective management of health and safety risks.

In 2013 CNSC observed that treated effluent discharged to the environment complied with licensed limits. There were three environmental spills that were remediated with no residual impact. Air monitoring shows environmental impacts were negligible. CNSC staff are satisfied that Rabbit Lake continues to protect the health and safety of workers and the environment.

Now for Key Lake operation. Cameco's Key Lake mill is the world's largest producer of yellowcake. The picture on the right shows Key lakes no facility.

Cameco's Key Lake operation

continued to mill McArthur River high grade ore in 2013. The slope stabilization project for the in-pit tailings facility was also completed. Key Lake continues to operate the in-pit tailings management facility and they have an above ground tailings facility which has not received tailings since 1996.

At Key Lake in 2013 radiation exposures were controlled and doses kept as low as reasonably achievable. There were no lost-time incidents. The CNSC staff observed a strong focus on accident prevention.

In 2013 at Key Lake effluent quality met licensed limits with the exception of a single pH exceedance. There were three environmental spills that were remediated with no measurable impacts to the environment. Air monitoring shows environmental impacts were negligible and CNSC staff are satisfied that Key Lake continues to protect the environment and the health and safety of workers.

And now I will discuss AREVA's McClean Lake operation. McClean Lake mill has been designed to process Cigar Lake hydrate ore. The picture on the right shows the McClean Lake

facilities. AREVA's McClean Lake ceased normal milling operations in July 2010.

In 2013 McClean Lake continued mill modifications for the milling of Cigar Lake ore planned for the fall of 2014. McClean Lake operates an in-pit tailings management facility that has been receiving tailings since 1999. At the McClean Lake operation in 2013, radiation doses were kept well below regulatory limits and as low as reasonably achievable. There were no lost-time incidents in 2013 and CNSC staff observed a commitment to accident prevention.

At McClean Lake, CNSC staff observed the contaminant concentrations in treated effluent were well below licensed limits. There were four environmental spills. All were remediated with negligible impacts to the environment. Air monitoring shows environmental impacts were negligible. CNSC staff are satisfied that McClean Lake continues to protect the health and safety of workers in the environment.

And now I would like to pass the presentation back to Mr. David Newland.

**MR. NEWLAND:** Thank you, Mark.

Based on CNSC staff's compliance

activities which included site inspections, review of performance criteria, desktop reviews, event and incident reviews, general communication and exchange of information with the licensees, CNSC staff concluded that a satisfactory performance rating was assessed for all 14 safety and control areas for the five operating uranium mine and mill facilities; that the licensees radiation protection measures were effective in keeping doses as low as reasonably achievable; that their environmental protection programs were effective, protecting the environment and that their conventional health and safety programs continue to protect workers.

CNSC staff conclude that in 2013 each regulated facility operated safely and met performance expectations with respect to the health and safety of persons and the environment and to Canada's international obligations.

With that, that concludes staff's presentation and staff are available to respond to questions. Thank you.

**THE PRESIDENT:** Thank you.

Before we start the questioning I would like to hear from Cameco Corporation.

Mr. Mooney, do you wish to add anything? Any comments?

**MR. MOONEY:** Good afternoon, Commissioners and President Binder.

Again, for the record, I am Liam Mooney, Cameco's Vice President of Safety, Health, Environment Quality and Regulatory Relations. With me today is Kevin Nagy, the Director of Compliance and Licensing for the Saskatchewan Mining Divisions.

Cameco is justifiably proud of the 2013 performance of our uranium mining and milling operations as detailed in the CNSC staff report. At Cameco we strive to achieve safe, clean and reliable operation.

We are pleased both the English River First Nation and the CNSC recognize the importance of the Eastern Athabasca Regional Monitoring Program. In addition to the assurances provided by our site-specific monitoring, this program demonstrates the regional ecosystem remains protected and that it continues to be safe to consume traditional country foods throughout the Athabasca Basin where uranium is mined and milled.



Strong performance continued in the key metrics report on for 2013 in the core safety and control areas of conventional safety, radiation protection and environmental management. We see this as reflecting positively on the strength of Cameco's people, as well as our management systems.

Thank you and we are pleased to respond to any questions that you may have.

**THE PRESIDENT:** Okay. I would like now to turn to AREVA Resources. Ms Van Lambalgen, do you have any comments?

**MS VAN LAMBALGEN:** Yes, thank you. Good afternoon. For the record, my name is Tammy Van Lambalgen.

I am Vice President, Regulatory CSR and General Counsel with AREVA Resources Canada. I am here today with Jim Corman, Vice President, Operations and Projects; Dale Huffman, Vice President, Safety, Health, Environment and Quality; and Jack Richards, General Manager at McClean Lake Operation.

I would like to note that Jim has to leave shortly. He is actually catching the mine flight to McClean.

I want to take this opportunity to restate AREVA's commitment to ensuring the protection of its workers, the public and the environment in all of its activities. This commitment is front and centre as we work towards resuming production at McClean Lake facility in the coming weeks.

With the publication of the annual reports on licensed facilities we appreciate the CNSC's efforts to continue to streamline the regulatory process while maintaining transparency to the public and ensuring the CNSC Commission remains informed.

AREVA agrees with the findings in the 2013 CNSC staff report on the performance of uranium mine and mill facilities for McClean Lake operation and we are available to answer any questions of the Commission.

**THE PRESIDENT:** Thank you.

So before we get into the formal question session I would like to proceed with the written interventions filed by two interveners as outlined in CMD 14-M58.1 from Corina Psarrou-Rae and CMD 14-M58.2 from English River First Nation.

So any question on the submission

by Ms Corina Psarrou-Rae?

**CMD 14-M58.1**

**Written submission from Corina Psarrou-Rae**

**THE PRESIDENT:** Ms Velshi...?

**MEMBER VELSHI:** I have a number of questions, but I will start with a couple and maybe get staff's reaction to some of the statements in the submission. So page 2, the second last paragraph, the last sentence that starts with:

"However, 'not one mine or mill site anywhere in the world has yet been cleaned up in a permanently satisfactory way...'"

Can you comment on that, please?

**MR. LeCLAIR:** Jean Leclair, for the record.

As noted in the report that's referenced, it actually dates back to 1993, which is now quite a ways back. We are now 21 years ahead of that.

I would have to say that there has

been tremendous advancements that have been made on decommissioning of mine and mill sites. Perhaps one of the more recent examples would be the Cluff Lake uranium mine and mill that was decommissioned in the mid-2000, around 2005-2006, which would be representative of a more recent decommissioned facility.

I think it is also important to note that it is not only about -- we are still dealing with some of the old mine sites and some of the old mine practices. This is not an issue that is unique to uranium mining and milling but actually is applicable to mining and milling in general.

But specifically what is important to note is it is the operating practices of today and the expectations of today with the currently operating uranium mines and mills that there are several measures that are in place to ensure that the future decommissioning of those mine sites can be done to ensure the long-term protection far into the future.

So the situation is much improved and I would have to say that since 1993 there has certainly been a lot of improvements that have

been made in that regard.

**MEMBER VELSHI:** Thank you.

My second question, again to staff and then perhaps Cameco, is on page 5 at the top:

"Taking into account that the Key Lake tailings containments were built without consideration of the possibility of the tailings freezing in the Canadian winter..."

What do you have to say to that?

**MR. MOONEY:** Liam Mooney, for the record.

Freezing does affect the rate of tailing consolidation, but it does not affect the environmental performance of the facility. So again, Cameco's commitment to the protection of the environment, as well as the public and its workers, remains core to our priorities and our values. And, ultimately, the performance of the facilities is not affected by any frozen tailings lenses that form in the facility in question.

**MEMBER VELSHI:** But the statement here that they were built without consideration of

this possibility of freezing, and I hear you saying, "Well, it makes no difference to the environmental performance," but was that into consideration or is this just luck, then, that it hasn't had an impact?

**MR. MOONEY:** It's Liam Mooney, for the record.

This facility's been functioning as in-pit tailings management facility for a good deal of time, and the performance has been within the expected bounds. So the predictions around the performance of the facility are still consistent and have been the subject of recent environmental risk assessments and human health risk assessments that support the continued operation of the facility.

**THE PRESIDENT:** Okay.

Do we have any specialists here that can explain to us what is the intervener is driving it? I mean there's a lot of chemistry and a lot of mumbo jumbo here, to me, about what is likely to occur because of the freezing.

What is the concern here, and is there any merit in it?

**MR. LeCLAIR:** So before I pass to

Karina Lange, who's the specialist who's here in the room, I'm just going to confirm that.

So we'll get Karina to elaborate a little bit further with regards to what the issue is with regards to ice lenses in tailings and impoundments.

But to provide a little bit of context to begin with, the situation right now with regards to frozen tailings, I believe it's two facilities that we currently have that have frozen tailings. We have the Key Lake situation here that's presented, and there's also this issue of ice lenses in the in-pit tailings facility at Rabbit Lake. So there's two facilities that currently have that.

The currently operating tailings facilities, so the ones that are currently receiving tailings, actively receiving tailings, we have the Rabbit In-Pit. The Key Lake and McClean Lake In-Pit Tailings Facilities have a water cover on them, so the placement of tailings there is done in such a way that there's no potential for tailings freezing, and the Rabbit Lake In-Pit Tailings Facility does subaqueous injection of tailings so that it doesn't freeze.

The issue has to do with placement of tailings during the winter months, during the extreme cold, that if the tailings are spigotted at surface, they'll freeze. During the spring it can take a long time for them to thaw, and because the summer months are fairly short in these northern regions, there have been occasions, and these are two particular situations, where the tailings did not completely thaw before the next winter months came in and tailings placement continued.

So I'll pass it over to Karina Lange, who can elaborate a little further, in terms of what are the issues and concerns and the importance relating to frozen tailings and these ice lenses.

--- Pause

**MR. LeCLAIR:** Sorry, that will be Dr. Son Nguyen.

**DR. NGUYEN:** Son Nguyen, for the record.

I'm going to clarify the situation with the ice lenses.

With respect to the two tailing facilities at Key Lake, there is no ice lenses in



the in-pit facility, the Deilmann facility, because the tailings are deposited under a water cover.

The issue with ice lenses are associated with the above-ground TMF, which hasn't been operating for a very long time. That issue was not recognized during the original design, which was in 1980-something. So the design was a subaerial deposition for the AGTMF, so that's one of the reasons why the AGTMF was not operating anymore.

The environmental impact, there wouldn't be any unless the ice lenses would thaw in the very long-term. It would influence the final decommissioning of the AGTMF because you need to put a cover on top of the above-ground TMF, and this cover might sort of deteriorate when the ice lenses would melt in the very far future.

So that was the main issue with the ice lenses with the AGTMF.

I don't know for --

**THE PRESIDENT:** You know, maybe it's me, I don't understand what you guys are saying.

What is the problem with tailing

being frozen?

**MR. LeCLAIR:** So perhaps I'll try to.

**THE PRESIDENT:** Yeah.

**MR. LeCLAIR:** I spent four weeks with trying to use plain language, and got tested to the absolute limit. So I'll give it another crack, and if I don't do well, Mr. President, please continue to ask me --

**THE PRESIDENT:** I'll let you know.

**MR. LeCLAIR:** Yes.

--- Laughter / Rires

**MR. LeCLAIR:** So, basically, when the tailings are placed, what will happen is if the tailings -- in this case, if the tailings are frozen, it doesn't really present a problem for the immediate performance of the facility.

At some point in time, when the final decommissioning is done, a cover goes on top of those tailings. What will happen is if those ice lenses, those frozen tailings, they'll start to thaw out, well, they're going to start to get reduced. They're going to consolidate. What can happen is the cover's going to start -- you can start getting crevices, subsidence, on the cover,

and that might affect the performance of that cover in the long term.

Because the whole idea is to try to get this nice, even cover, and so that when the rain comes on top of it that it flows around and it doesn't collect into these ponds, and things like that.

So, basically, the idea here is it's not an immediate issue, it's more of a concern when the long-term decommissioning comes in. Before that final cover placements gets done, this issue needs to be addressed in order to ensure that that cover is actually going to perform the way it's intended to in the long term.

So it's not an issue for today, it's more of an issue at decommissioning. It's more about: how will that cover act over time based on how those tailings, if they melt, how that's going to affect the cover.

**THE PRESIDENT:** But the interveners are talking about all kinds of chemical things, which I -- you know, reoxidize, there's all kinds of references to other processes going on. If the cover caves in, you can just refill it. I'm trying to understand what are the

environmental impacts in here. I don't understand the whole --

**MR. LeCLAIR:** I'll ask Dr. Nguyen to confirm with me if I'm incorrect, but I believe --

**THE PRESIDENT:** No, I think we've got somebody else behind you here.

**MR. LeCLAIR:** Okay.

Well, what I was going to say is that we don't support the concerns that are being raised. And if I get corrected -- I'll allow someone to correct me in the back here, but based on what Dr. Nguyen has said, we don't see that as an issue right now.

But I'll pass it back to -- who's going to...?

Oh, Karina. Karina Lange will now proceed with further information.

**MS LANGE:** Karina Lange, for the record.

So this question had two parts, from what I understood in the intervener. There's the effect of the winter on the sort of physical behaviour, as Dr. Nguyen explained, so the actual flow conditions and long-term performance, and

then the intervener also raised questions around, as you said, how the Canadian climate affects the chemistry.

I believe they mentioned such things as influence on oxidation and some type of geochemical influence on the behaviour of the tailings, so thus implying that contaminants could be released into the environment.

But for each facility that is located in northern Saskatchewan, there are extensive programs that look at the composition of the chemistry of the tailings. So these were studied at the temperatures that are expected in the field, and sampling occurs, you know, at regular intervals, obviously under those conditions. So we are aware of what the contaminants are doing under those conditions. There's no sort of major surprises as we are monitoring them over time.

**THE PRESIDENT:** Ms Velshi.

**MEMBER VELSHI:** So the freezing issue for the above-ground tailing facility is a real issue, it's just not an issue for today. But it is one that needs to be addressed down the road.

**MR. LeCLAIR:** That's correct.

**THE PRESIDENT:** Monsieur Harvey.

**MEMBER HARVEY:** Just on page 11 of your presentation --oh, it's about that specific point.

**UNIDENTIFIED SPEAKER:** The intervention.

**MEMBER HARVEY:** No, no, no, no, no.

**THE PRESIDENT:** Still on intervener.

Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

On the last page there's an extensive discussion of the bystander effect, and a lot of what I'm reading here doesn't fit with my understanding of the bystander effect and it certainly seems to take some of the literature and apply it very selectively to the potential implications.

Can somebody provide us with a simple guide to the bystander effect and satisfy, at least me? Because I think this is a misreading of the bystander effect, and I'd like to be

confident that I'm not misreading that misreading.

**MR. LeCLAIR:** I'll ask Rachel Lane if she could answer your question, please.

**MS LANE:** Rachel Lane, for the record.

The bystander effect is a biological effect is such that, if a cell receives radiation, then its neighbours can actually also have the same type of effect as the cell that has received radiation.

Now, when we look at low-dose radiation exposure, there are many mechanisms that go on at the cellular level. We are aware of them. There's hormesis, there's a threshold effect, there's the adaptive response, there's bystander effect, and so on.

For regulatory purposes, we use the linear non-threshold hypothesis, which basically means that risk is proportional to dose. This is based largely on the epidemiological evidence at which we see health effects. When we get down to very low doses, it's very difficult to observe health effects in people below about 100 millisieverts.

So for the LNT model, for

radiation protections purposes we make the assumption that what we see at higher doses is proportional to dose down to zero. And it is an assumption.

What the intervener appears to be doing here is focusing on one of the biological mechanisms that goes on at the cellular level, and focusing on it as the only mechanism. However, the science clearly states that there are several mechanisms, different mechanisms going on, and perhaps they have chosen the one that would benefit their position.

Thank you.

**MEMBER MCEWAN:** I mean my understanding is that the bystander effect is as a biological phenomenon is also seen in transplant rejection and in a number of other sort of biological phenomena.

But if you just look at the way in which this is described, is there any way that it could, as an isolated phenomenon, taken out of context, be creating some of the issues that she discusses?

**MS LANE:** I'm not exactly in the position to respond to that. Could I get back to



you with an answer?

--- Off microphone / Sans microphone

**MS LANE:** Thank you.

**THE PRESIDENT:** Anybody else?

Mr. Tolgyesi.

**MEMBER TOLGYESI:** I have two short questions.

On page 2, at the bottom, and on page 3, on the top, I assume this paragraph is saying that since 1977, when responsibilities of management of uranium tailings were transferred from the provincial to federal government many of the tailings have not undergone any remedial work designed to place them in safe conditions.

Could you comment on that?

**MR. LeCLAIR:** For this particular question, I'd like to ask Don Howard, who's the Director of the Waste and Decommissioning Division, if perhaps he can quickly go over. There's been a lot of work that's been done in dealing with some of the old mine sites. There's references to the CLEAN program. There's several things that have been done. We already know that we have the Gunnar Project in particular, which will be coming before the Commission later this

year, as an example, where things have been done to address old mine sites.

So I'll pass it over to Don Howard.

**MR. HOWARD:** Don Howard, for the record.

Back in 2001, the CNSC undertook what they called the CLEAN program, where we looked at -- with the introduction of the *Nuclear Safety and Control Act*, we looked at all of the various old uranium mining operations across Canada where uranium tailings might have been deposited or old uranium mines were located.

We looked at all of those sites across Canada, and basically all of the sites that now were caught under the *Nuclear Safety and Control Act* we brought in under licence, with the exception of Gunnar, which is going to be presented to the Commission in the November hearing. So those are basically under way.

Some sites, such as Elliot Lake and Bancroft, are under licence. They are operated by either a private organization, such as Denison or Rio. Some of the mines where there is no owner, which cannot be held accountable

anymore, has been reverted to the province, and licences have been issued to the province to maintain those sites.

**THE PRESIDENT:** In the same vein, can you do a little quick overview about the role of the federal government in the exploration licences?

The intervener, on pages 1 and 2, complains about the way those exploration licences are given.

**MR. LeCLAIR:** I believe I can answer that question.

It's important, yes. I think that we put it clearly on the record that CNSC does not regulate the exploration for uranium, or any other metal, for that matter. This is under provincial jurisdiction. So these questions the intervener has would probably be better directed to the province, rather than the CNSC.

**MEMBER TOLGYESI:** And my last, on page 3, second paragraph, one, two, three, fourth line before the end, is the intervener's concern that the ALARA cost benefit approach is not currently meeting the expectations for the safety and security of the environment and its

inhabitants.

**MR. LeCLAIR:** With regards to this particular comment, I believe, actually, there's two things that are being mixed up.

We have set limits that are based on protection of the public of 1 millisievert per year annual dose limit, which is clearly protective of people. We have clear regulatory limits that are set for workers as well.

This is actually the application of ALARA, which is actually trying to keep doses significantly below the limits that are deemed as safe. So ALARA really looks at trying to keep radiation exposures as low as possible, so it's quite a bit below the actual limits.

And I believe, as you've observed, at least we can speak for the uranium mines and mills, I think we've seen it earlier as well for the processing facilities, the radiation exposures to which workers are being exposed are substantially below the limits, and certainly the exposures to the public are also significantly below the limits.

So they demonstrate, I believe, quite clearly that ALARA is being applied

effectively. But I believe in this particular situation the intervener seems to be confusing the ALARA principle with overall expectations with regards to protection of workers and the public that are set out in the regulatory limits.

**THE PRESIDENT:** I think maybe it's a good time to bring in our medical expert.

Dr. Irvine, you've been listening to some of the questioning here and I wonder if you can comment.

On page 5 of the intervener, they make this statement. I've heard now many times before, and I've heard a rebuttal of it many times before, I just want to hear your opinion.

They're talking about miners in general, and it concludes:

"In other words the lung cancers among uranium miners were 30 per cent higher than that of the general population."

In your experience, is there any evidence that the miners of uranium in Saskatchewan have any higher incidents?

**DR. IRVINE:** For the record, this

is James Irvine, Medical Health Officer of Northern Saskatchewan.

The main data that we have for Saskatchewan uranium miners has to do with the worker epidemiologic study that was done in the old mines. It does show that even though the overall cancers for uranium miners from the old mines, leading up to about 1982, the overall rate of cancer was similar to miners as they were to the general Canadian male population.

It was elevated slightly for lung cancer, but there is always some challenges as it relates to the other exposures in the old mines as well, such as smoking, diesel fuels, things like that. But certainly there is evidence from the old mines of elevated levels of lung cancer.

Rachel Lane will be intimately involved with that research and would be able to provide some more information on that as well.

**THE PRESIDENT:** Ms Lane.

**MS LANE:** Rachel Lane, for the record.

Yes, what Dr. Irvine said is exactly correct.

The CNSC was involved in a study

of the Eldorado workers. They were the workers that had very high radon levels prior to the time of radiation protection and ventilation in the mines, so they were receiving very high radon exposures. As a consequence of that, they did develop lung cancer at higher rates than the general male population, as we found about 30 per cent higher. However, when you looked at their overall health, their causes of death from all causes combined were lower than the general male population, as was all cancers combined.

What's important from this is this is looking at high dose. We have progressed in our understanding of uranium miners significantly over the last few decades such that we are now focusing our efforts on understanding the health effects at more moderate doses.

In fact, right now there's a study under way using the Eldorado cohort, as well as the French and Czech miners, who had high quality information on their doses, as well as relatively low exposures, so that we could look better at the effect of low-dose radon exposure.

As part of the study, the Saskatchewan uranium miners study, we also

conducted a feasibility study of modern miners based on the doses that we see today and we tried to project the risk of developing lung cancer into the future to 2030.

And given the risk models that we have based on many studies of miners, applying that risk model to the exposures of today's miners, we can basically expect out of about 24,000 miners that will be working in a Saskatchewan uranium mine up to about 2030 about 142 of these miners will develop lung cancer and one of those can expect to develop lung cancer attributed to their occupational radiation exposure in the mine.

So one additional, which is tiny, which means it's very, very difficult to study these miners because their doses are so low today.

In essence, today's miners are as healthy as the general population and it becomes increasingly more difficult to study them because of other factors such as their residential rate on exposure is likely higher than their occupational exposure, plus you look at other risk factors such as smoking, which is the number one cause of lung cancer in Canada.



Thank you.

**THE PRESIDENT:** Okay. Thank you.  
Anybody -- anything else?

I have one last question. Sorry;  
go ahead.

**MR. LeCLAIR:** I would just like to  
put this into perspective.

So when Rachel was mentioning the  
kind of exposures, so if we go back to the old  
mines, it's important people get perspective.

In the old mining operations,  
ventilation systems were very, very poor. If any  
ventilation was present, it was quite limited.

The mining practices were very  
labour intensive. You didn't have the level of  
ventilation and dust suppression systems that you  
see in the current mines.

So to give you some perspective,  
the kind of doses that were estimated for these  
early mine workers were measured in the hundreds  
of millisieverts, while today's mines, as you've  
seen earlier today, radiation exposures are -- the  
highest exposures are maybe the 10 to 15. That's  
for one worker. The vast majority of them are  
getting average exposures that are substantially

less.

So it provides a bit of a perspective why we're confident today that the exposures are substantially lower and, therefore, we expect that the conditions are much safer for the workers.

In fact, I could even add to that that the important consideration as well is not only that their exposures to radon, but it's also emissions from diesel equipment, which is what you find, typically, in a lot of mining operations.

So diesel emissions, we know, contain a lot of carcinogens, so those are also reduced as a result of these much better ventilation systems that you see in today's mines, not just uranium mines and mills, but also other mines in general.

**THE PRESIDENT:** Okay. I've one last question here.

On page 4, there's a statement on the last -- beginning of the last paragraph on page 4:

"So far, 10 lakes surrounding the decommissioned area lake mines have been declared

beyond recovery or permanently dead by the Ontario environmental assessment."

Anybody want to comment on this?

**MR. LeCLAIR:** So for that, again, I would like to ask Don Howard if he could perhaps start us off on this particular topic.

**MR. HOWARD:** Don Howard, for the record.

Elliott Lake, which operated a number of years ago, basically, the practices back then was to cover the tailings with a water-based cover. So a lot of the areas that we're talking about in and around the Elliott Lake mines, there's approximately 70 lakes or so that are in around that area.

Some of the tailings are water covered. Whether she considers that to be a lake, there are sediments -- tailings at the bottom of a lot of the lakes. That was the practice back then.

So basically, whether I would declare them beyond recovery, a lot of them are recovering now. There are -- like I say, there

are tailings at some of the bottom of the lakes and it has had a minor effect on some of the bentonite population at the bottom of the lakes, but they are recovering.

And as I say, with the Elliott Lake area, there is the Serpent River water management program which does sample or evaluate all of the mine discharges and all the water changes on the watershed in that area.

And in addition to that, there's the in-basin monitoring program that is conducted which complements this program, which focuses on the risks to biota feeding at the TMAs in the Elliott Lake area.

So in essence, the lakes were used as a storage area for the tailings in the past practices. They are recovering. It's slow. But there are still some tailings at the bottom of some of these lakes.

Whether they're declared beyond recovery, recovery will take a long time.

**THE PRESIDENT:** But isn't it -- if memory serves right, I think you gave us a briefing a while back there's some companies over there that still are maintaining, processing and,

in fact, overseeing the return to nature of some of the big lakes are recovering quite nicely, if memory serves right.

**MR. HOWARD:** Don Howard.

Yeah, that's correct. There's a lot of work that is being done in the Elliott Lake and Bancroft areas.

As I say, past practices, the practices that were done back then are not the practices that -- the best practices that would be done today.

There's a lot of work that is being done to recover a lot of the areas.

As I say, I'm just reading here that the Serpent River watershed, there's more than 70 lakes involved. There's nine sub-watersheds which cover an area of 1,376 square kilometres, and all of this drains into Lake Ontario via the Serpent River.

So that's why there's the Serpent River water monitoring program, there's the in-basin monitoring program to ensure that the impacts -- you know, there's no further impacts and basically allowing the environment to recover.

**THE PRESIDENT:** Okay. Thank you.

Anybody, any other questions?

Okay. Thank you. Let's move on to the next intervenor, which is a submission filed by the English River First Nation.

Any comments?

**CMD 14-M58.2**

**Written submission from the  
English River First Nation**

**THE PRESIDENT:** Just maybe to have one, it's basically whether we keep -- whether we keep the English River First Nation up to date with some of the results of the Eastern Athabasca Regional Monitoring and some of the data.

Do we get them -- are they involved in some of the collection of samples and measuring of the environmental impacts?

Maybe the panel -- somebody from Saskatchewan government can comment on that.

**MR. McCULLUM:** For the record, it's Kevin McCullum with the Ministry of Environment.

English River is not directly involved with sampling per se, but it's always

been open that we try to extend the program to whichever community we can try and move it to.

So it's one of those -- it's an adaptive monitoring program as we go through, so having a community that's interested to go forward, we'll definitely try and do something there.

**THE PRESIDENT:** Okay. Thank you. Anything else?

Okay. So let's get into the formal question period. And again, we're starting with Ms Velshi.

**MEMBER VELSHI:** Thank you.

I'll start off with some fairly quick questions.

Do you see any value in comparison with other mines outside Canada as we look at performance whether it's on dose or environmental impact?

**MR. LeCLAIR:** We certainly are always interested in knowing what's going on around the world. It's an interesting question because in our experience, actually, Canada is looked upon by a lot of countries in terms of practices that we've put in place because we've

had operating uranium mines for decades now.

We are actually considered to have some of the more advanced systems, so often what will end up happening is we're getting a lot of requests, actually, for support from other countries around the world who are maybe looking at getting involved in uranium mining.

We certainly do look at Australia. In fact, Australia has adopted -- a lot of their regulatory approaches have been adopted based on Canadian standards.

We look towards the Americans as well. We're always working closely with the Americans.

Some of the difficulties are that when you're trying to do these comparisons, they're a bit challenging simply because of the nature of what we're dealing with.

In northern Saskatchewan, we're dealing with uranium mines with grades that are approaching 15 to 20 percent when, around the world, you see grades that might be 0.1 percent. A 0.5 percent grade in uranium mine anywhere else in the world would be considered to be a very high grade mine. So we're at very different scales.



The other important consideration is actually the kind of mining that's done as well, so Kazakhstan is a major producer of uranium, but its operations are all *in situ* leach operations, so it's a very different way of mining. So because of it, it has a very different profile from a radiation protection perspective.

Similarly, in the United States you're also -- we're also looking at *in situ* leach operations, so they don't have operating underground mines or mills.

So the best examples are places like Australia with Olympic Dam but, again, you're looking at grades that are less than .1 percent. You might be looking at Niger in Africa, but we don't see -- we certainly would not see Niger as being our benchmark in terms of the best performance. They have a lot of challenges there, and we're always trying to help them.

So overall, we certainly try to keep our eyes open and our ears open to see what's going on around the world, but the reality of the situation is Canada really is a leader in the area of uranium mining in particular and the regulation of uranium mines and mills.

**MEMBER VELSHI:** Thank you. Thanks for that response.

Again, a -- well, the first one wasn't a quick question. This, I think, is.

In the earlier presentation on uranium and nuclear substance processing, when the radiation dose information was presented, they also said, you know, a couple of action levels were exceeded. I didn't see that in this presentation, and I just wondered whether it was safe to conclude that no action levels had been exceeded at any of the mines or mills.

**MR. LANGDON:** Mark Langdon, for the record.

There were some action levels exceeded. I don't know exactly how many, two or three, maybe, in the five facilities. And they're discussed in the report.

For the presentation, we focused on limits. Action levels are really -- we have administrative levels and action levels all the sites and the code of practices for radiation.

And the administrative levels are levels that the companies deal with. They take action when they see these things happening. And

the action levels are where they have to report to the CNSC, and for each one, we follow up to see what they're doing in reaction to it, what they do to prevent future such occurrences.

And all of the action levels that did occur in 2013, we've -- we're satisfied that they took the appropriate action.

**MEMBER VELSHI:** Thank you. I'll look at the report, but I think for the sake of consistency, it may be something for you to consider.

And my last question for this round was, for the external events where you asked the licensees to follow up to see what the implications were, I was interested in the Fukushima follow-up and the one from the potash mine where there was a lack of power and breakdown of communication equipment that when the Fukushima follow-up was done, is that not something that would have looked at to see what their emergency response capability would be in the event of lack of power?

**MR. LeCLAIR:** Yes, actually, as part of the Fukushima, that was definitely a key part of what was reviewed.

The mines, again, because of their locations, the need for back-up power, for example, is actually crucial simply because it actually happens more often than not. The reliability of the systems there are a little more challenging.

You're dealing with harsher environmental conditions, so there's a whole -- it's certainly a key part of the emergency response program. It's part of the tests that they do as well, so it's part of their emergency evaluations in terms of loss of power and recovering from loss of power.

So these things are all tested and they've all been evaluated, and this certainly was a key part of what was considered in the follow-up to Fukushima.

So they even did an emergency exercise that involved multiple events happening, you know, severe weather conditions, loss of power, accident all happening all at the same time and how they could respond to that.

So that's definitely an important consideration, and it was looked at.

**MEMBER VELSHI:** Right. But my

question was, so when the potash incident happened and if you went back to the licensees to say, "Hey, any learnings for us?" hopefully they would say, "Yeah, we already looked at that when we did the Fukushima follow-up and we're confident that we've got the right measures in place".

**MR. LeCLAIR:** Yeah. With regards to the Allan potash mine, I believe in this particular situation we were really providing the Commission assurances.

We didn't really need to go to the licensees. These are all information that we had readily available, so we provided it more to provide assurances to the Commission that there are measures in place, that things are adequate, and there's -- this is already in place and has been in place for quite some time.

**MEMBER VELSHI:** Thank you.

**THE PRESIDENT:** Okay. Let me ask the question differently.

So how come the potash mine didn't have a back-up that's gone on automatically and they were in the dark for a while?

Now, I don't -- you may not know the answer to that, but I want to know that it

cannot happen in our own mine.

**MR. LeCLAIR:** What I'd like to perhaps provide some context around that is, actually, the provincial labour inspections have gone out and they've reviewed the Allan potash incident, so our colleagues in the province have reviewed that.

And in fact, in their situation, it wasn't the emergency response that they're focusing on; it's actually the event itself and the fire and what the lead-up to the fire is.

And it's not because they're dismissive or they're disregarding communications. It's not that they're -- I'm not going to suggest that they're trivializing it or not seeing the importance of it. It's perhaps more looking at considerations which is the essence of the refuge station.

Mark went through quite a bit of time explaining the refuge station and the functioning of the refuge station.

Mine rescue and the mine environment is really intended to deal with -- because there's a lot of different situations that can arise.

The refuge station is the critical component. Certainly communications is important, but the most important is -- and it's entrenched into the miners' psyche, if you like. Perhaps Mr. Tolgyesi will be able to speak to this from his background.

But the thing about the refuge station is that they're trained to go to the refuge station and you stay in the refuge station as long as you have to. And whether there's communications happening or not, they know they have to stay there. They know they have to be there, and it's a safe place.

That's why there's food, water. There's also the essentials to keep them alive, to keep them safe.

And the reason why is because sometimes even the best of the communication system because of, let's say, a major ground fall, could take out the electricity, take out a lot of things that you can't recover immediately. So that's why refuge stations are there.

It's important that the workers know that they're supposed to report to the refuge station and stay there. And they'll stay there as

long as it takes until a mine rescue team will come in and access that area. They'll confirm who the people are there and they can take them and remove them safely from the mine.

So in many ways, the Allan potash and the response, the reality is there's a lot of things that they did, actually, that were very good.

I read the incident, for instance, of the four miners that actually created a brattice. They basically built themselves a wall to isolate themselves from the contaminated portion of the mine to keep themselves safe.

That's a very -- I'll call it a classic mine rescue reaction. It's what you expect. They did the right thing.

But in that situation, those people were now in an area where they wouldn't have had communications, but they were safe. And they stayed there until the mine rescue teams could come in and then the mine rescue teams are all very heavily trained in dealing with emergencies and knowing how to deal with emergencies, again, because the mine environment, they're large openings. Potash -- this particular



mine in particular is very, very large. Very large areas underground.

They have to be able to address multiple scenarios that happen so the refuge station is the key thing.

**THE PRESIDENT:** We're not taking away -- it's not either/or. I accept all the safe location, et cetera.

I'm trying to understand why there was a blackout in the potash mine and whether it could occur -- because back-up power is so crucial. I'm trying to figure out whether -- what's the back-up, if you like, blackout resistance in the uranium mines.

**MR. LeCLAIR:** So we've elaborated on what the uranium mines and mills are.

I would say probably the uranium mines and mills may have more than the potash mine might have had, but I won't -- I can't elaborate on the --

**THE PRESIDENT:** Let's hear from Cameco, and maybe Saskatchewan people can tell us a little bit about the differences here between the uranium mine and the potash mine.

**MR. MOONEY:** It's Liam Mooney, for

the record.

I'll ask Kevin Nagy to provide some additional detail here, but I think Mr. LeCLAIR touched on it well in our unique situation, geographically speaking, in northern Saskatchewan dictates that we have additional back-up power that might not be the case given the reliability of the electrical systems in southern Saskatchewan.

But with that, I'll hand it over to Mr. Nagy.

**MR. NAGY:** For the record, Kevin Nagy.

The fire at the potash -- the Allan potash mine in Saskatchewan was a vehicle fire underground and the location of the fire was in close proximity to a major power line underground that supplied one section of the mine. So when that power line was damaged, they did lose power, they lost communication for a certain period of time.

At the mines in -- Cameco mines, we do have redundant power supplies, so we do have more than one line going from surface down to the underground operations. We have more than one

sub-station. We have more than one switching gear, more than one main power line.

So I'm not saying it would be impossible for that to happen, but I would say that it's not likely, and we have defence in depth and back-ups in place.

We also have back-up power on surface if it's required that can be used to run the essential services in an emergency situation.

With respect to communications, we have back-up communications that don't rely on power. We have oxygen supplies as well that don't rely on power, so we have redundancy, we have defence in depth and we have the back-ups in place to make sure that the risks are low should the situations arise.

**THE PRESIDENT:** Thank you.

M. Harvey?

**MEMBER HARVEY:** Merci, monsieur le président.

On page 20 of your presentation, about the compliance activity, there has been a number -- 21 notice issued and they were closed. So I'm very happy with that. But is it because those notices were not so important or because the

sector, the mining sector is very quick to close the issues?

**MR. LeCLAIR:** Jean LeClair, for the record.

Generally speaking, the mining companies do react fairly quickly on action notices. In fact, at times, they will actually address the action notice while the inspector is actually still on site. So often the action notice is issued and the response is provided on the spot. I believe that may be a reflection of the way the licensee operates.

So they do act fairly quickly. And clearly, none of the action notices here were of a large enough magnitude that might have required an extensive period of time to respond.

But I believe it is fair to say that the licensees do respond well, they take the action notices very seriously and they do act on them fairly quickly.

**MEMBER HARVEY:** Thank you. Another question on page 28.

It is about that comparison of other mining sectors. I am just questioning myself about the utility of this.

You mentioned that one even change the percentage for the uranium mine. Is that right? Is that correct to say that? Just one even...?

**MR. LeCLAIR:** That is correct. In this situation it was a single sample, single time, that lead to the change. It is certainly something we can look at for the subsequent years, whether we need to revisit that table. It is always an opportunity for us to relook at it.

But that is correct, the 80 per cent is basically that one of the mines at one time had an exceedance which lead to that percentage. So it is a pretty severe measure.

**MEMBER HARVEY:** I don't know what to think about that comparison. Because in some sectors you have got 43 facilities, 50 facilities. And if you cut one even, that would be 1 over 50, 1 over...

So what I don't know the value of that figure.

**MR. LeCLAIR:** So I certainly take that under advisement, and I think we will relook at that table and look at it given this particular situation and see if there is another way to

present the information that will be more useful.

Certainly you are correct, when you have five and you have one, you have an automatic drop of 20 per cent.

**MEMBER HARVEY:** Because we don't know the number of samples that have been taken in each site.

**MR. LeCLAIR:** So we can certainly relook at that for the subsequent reports.

**MEMBER HARVEY:** Okay.

**THE PRESIDENT:** But I do think though, however, it is interesting under the previous three years 100 per cent compliance. That is --

**MEMBER HARVEY:** Yes, I saw that. But I saw that that changed very quickly.

**THE PRESIDENT:** That is right.

**MEMBER HARVEY:** So for one even --

**THE PRESIDENT:** That is right. One out of five, it is a big number.

**MEMBER HARVEY:** No, it is not one in five, it depends on the number of samples that have been taken.

**THE PRESIDENT:** No, but it is one facility that is being non-compliant and --

**MEMBER HARVEY:** Yes, but can you judge...?

**THE PRESIDENT:** You want to...?

**MEMBER TOLGYESI:** Yes. My question was should the sector compliance be established a number of mines or rather a number of tests for each element? Because if you have five mines and 10 tests each has, which means is 50, okay?

And in one mine or 10 tests only one will miss, nine will comply. In another mine all 10 will miss. So you have in the case two mines which are noncompliant, but one is only with one test over 10 and the other one is all 10 tests.

That is why --

**THE PRESIDENT:** But this is Environment Canada's statistics

**MEMBER TOLGYESI:** Yes.

**THE PRESIDENT:** I am not sure at what level of information we have access to this.

**MR. LeCLAIR:** I can certainly look into this further. I have seen some more recent data from Environment Canada. And again, I think we can relook at this and see if there is another

way to present the information that provides a more fulsome review.

**MEMBER HARVEY:** Change the presentation maybe.

On page 4 of the document it is about the training about the conduct of inspections. In order that the approach will be similar from one region to another I suppose. That is the last paragraph before 121.

**MR. LeCLAIR:** I am sorry, could you just repeat the page number? I missed that.

**MEMBER HARVEY:** On page 4 of the document, of your CMD.

**MR. LeCLAIR:** Okay.

**MEMBER HARVEY:** It is about the training of CNSC Staff. The CNSC also develop and implement the conduct of inspection and on-the-job training procedures for inspectors.

My question is just, is it completed and can we be sure now that the approach is the same everywhere?

**MR. LeCLAIR:** There has been a lot of work done on the conduct of inspection, inspector training for all inspectors at the CNSC. And I certainly can say that we have a lot more



consistency across all inspections for all nuclear facilities.

Speaking specifically for uranium mines and mills though, we have a well-established training program for all our inspectors now, that they have to go through that includes the on-the-job training and verification kind of inspection.

So we have got a pretty consistent approach now that we go through that involves observation, participation inspection, leading inspections with mentors that are present, and final testings that are done at the end to verify and confirm that the inspectors understand the procedures, that they are following the procedures, that their approach is appropriate and they are meeting all the expectations before we issue them inspectors cards.

**MEMBER HARVEY:** You mentioned the mining sector, but that has been done for other sectors too?

**MR. LeCLAIR:** That is correct. It has been done -- this was a major corporate initiative across all the CNSC to ensure that all card-carrying inspectors, regardless of what facilities they are inspecting, are going through

a formal training program and verification program before they are issued inspectors cards.

**MEMBER HARVEY:** How many inspectors are in the staff?

**MR. LeCLAIR:** In UMMD, I believe the numbers are about 12 or 13, I don't have the exact numbers. Twelve or 13 across UMMD.

I think the number of inspectors across all the CNSC is somewhere around 125.

Mr. Jammal just corrected me, he said, 128.

**MEMBER HARVEY:** Thank you.

The other one is on page 8. That is the original monitoring program for country foods.

In the second paragraph you say, "Most chemical concentration were below available guidelines." When you say that, most, what do you want to say? There are some which are over the guidelines and...? How many were over the guidelines?

**MR. McCULLUM:** For the record, it is Kevin McCullum with the Ministry of the Environment.

Overall, and I can touch on this

very quickly, but I am hoping that James can jump in at anytime in Saskatoon.

With some of the samples, as they have been collected throughout, as most samples that are collected you will have some that are outside the range. And we did have a few samples that were slightly outside, so they were questioned, more like outliers of the data.

And so we are still collecting the baseline years of data, we are still looking at some of the realistic nature of what is the spread of these datasets that we are looking at?

And I am really hoping that James can add into more of that.

**DR. IRVINE:** Okay. This is James Irvine, for the record.

There were a couple outliers in the data from the 2011/2012 sampling period. One of the examples that Kevin was referring to was lead. In a couple samples there was elevated lead levels.

And one of the concerns when there is sampling is in the use of lead bullets. So for game there is often use of lead bullets, for fowl it could be lead shot.

And so this is an area that we have commented on in terms of for future sampling, is try to develop ways by which we can either avoid lead bullets, which are a lot cheaper than alternatives, but ways by which we can avoid the potential contamination from the shot itself.

So other examples would be taking samples from various parts of an animal, whether it is a moose or a caribou, and try to avoid getting it reasonably close to the place where the animal was shot.

Sometimes a bullet can hit a bone and can spread in fairly small fragments in other parts of the meat. So even though you may avoid the direct spot of the wound, you can still be exposed to lead.

So that was one of the examples where there is a couple outliers.

The other outlier was in selenium in one site there for one type of fish, whitefish. So those were the outliers of the sampling that was found during the 2011/2012 period.

**MEMBER HARVEY:** So would you say that it is not so important taking into account the number of samples you collect?

**DR. IRVINE:** The challenge with the lead was that it was in caribou. And so the sampling numbers were smaller.

So there was a couple of samples there for two sites in which the lead levels were slightly elevated. But, as I say, it is likely due to the sampling or the procurement methods of gathering the samples.

**THE PRESIDENT:** Can I then ask once you reach a conclusion about -- and it is also for the Saskatchewan Government, everybody was doing this food study and the berries and the caribou, et cetera.

Do you reach a conclusion that says it is safe to eat, it is safe to drink, it is safe to collect, and share this with the communities? How do you do that? How do you disseminate the information?

Who wants to go? Dr. Irvine, maybe you can enlighten us on this and maybe Saskatchewan Government?

**DR. IRVINE:** This is James Irvine, for the record.

There has been several hundred food studies done, one through Cameco in the

Uranium City area. And that has been shared fairly completely through Cameco with the community, with various community meetings.

Cameco may wish to comment on that.

The country food study that was referred to in the CNSC Staff presentation has been shared with Athabasca Working Group, the communities who have been engaged in the process. And as well, is readily accessible on the website that is the Eastern Athabasca Regional Monitoring Program.

One thing we have done as well over the last while has been also to incorporate the ideas of -- this is a lot of information that is available on all sorts of different contaminants or environmental chemicals, but we have added to be incorporated into the Eastern Athabasca Regional Monitoring Program in the future was also the positive influence of healthy foods. Looking at the various fat components of country foods, the vitamin levels, the protein levels, the mineral levels in comparison to store-bought foods such as hamburger or chicken.

So that will be incorporated

within the community dissemination and sharing of information with communities on that balance of concern for country foods.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi?

**MEMBER TOLGYESI:** Merci, Monsieur le Président.

Just in conclusion on this compliance. I believe that when you go by number of samples it gives you much more precise picture of how far you comply with regulations or not.

This being said, they want us to use two toxicity tests; one is a rainbow trout, another one is Daphnia. You don't talk about the Daphnia. We don't do that in uranium mines or for some reason we don't consider that or just we didn't put it in the report?

**MR. LeCLAIR:** Daphnia magna testing is also done, it is all part of the program under the environmental effects monitoring program, under the metal mine effluent regulations. So it is done as well.

**MEMBER TOLGYESI:** But it is not in the report.

**MR. LeCLAIR:** That is correct.

Perhaps one thing that is important to put into perspective, the *Daphnia magna* results are not a regulatory requirement. So a failure of a *Daphnia magna* test is not a failure of the regulations, unlike the acute lethality test on trout.

So Environment Canada put in place the *Daphnia magna* tests are there as indicators, it is not a regulatory requirement that sets out the requirements based on pass or fail criteria on those tests.

**MEMBER TOLGYESI:** When you are looking the decommissioning, in their reclamation, they found that in Appendix F that we use always for mines, a period before -- between end of production and institutional control, for mines we use 13 years from end of production to institutional control. Okay?

And those are 13 years for mines, like Cigar Lake, and McArthur. Whereas for mills like Rabbit Lake, McClean and Key Lake it is a different period. For Rabbit Lake it is 28 years, for McClean it is 41, and for Key Lake it is 55 years.

Could you comment on that? It depends on the size of a facility and history of



facility or tailings uranium content or all of these?

**MR. LeCLAIR:** There is several factors that will influence the duration of the monitoring program. It is important to first note that each site is part of the mining companies themselves, the licensees, have to submit their plans in terms of what their expectations are.

But, yes, in a nutshell the important factors that are considered, for instance, if you have tailings facilities, McArthur River and Cigar Lake do not have tailings facilities. Tailings facilities, there is quite a long period of time that is needed to verify that consolidation is happening, that the performance criteria is being met.

There is a lot of analysis that needs to be done. There is the placement of the cover that needs to be done and the stabilization of that cover over time. So when you have tailings facilities the monitoring periods are already going to be lengthened.

If there is acid-generating waste rock, for instance, and covers need to be placed on the waste rocks, that we will tend to also

require longer monitoring periods while you are verifying the conditions are stabilizing and the performance is there.

So it really is a site by site case and it depends on the conditions of each site. Clearly, if it is mining or milling it will make a difference. McArthur River and Cigar Lake, because they don't have tailings facilities, the decommissioning of those mines are expected to be a lot quicker and the stabilization of those sites is expected to happen in a much shorter period of time than some of these older sites.

Rabbit Lake has a lot more history to it, several open-pit operations and underground mining operations. So a lot of monitoring needs to be done to verify that the conditions are stabilizing and some of those just take a much longer period of time.

**MEMBER TOLGYESI:** And last in this round, Mr. President --

**THE PRESIDENT:** Just a second, I want to jump on this one.

First of all, I really find these charts really useful. It gives in one place the time horizon.

What I wanted to know is did you -- and I understand it is just a plan, but did you now figure out where the financial guarantees that the company's committed to are consistent with those timelines? Did anybody do the cross-verification?

Why don't we start from the companies? Let's hear from Cameco and AREVA. Are those timelines consistent with the amount of money you set aside to do this job?

**MR. MOONEY:** It is Liam Mooney, for the record.

And the preliminary decommissioning plans are the basis for the document found in the CNSC Staff report. So the preliminary decommissioning plans then feed the preliminary decommissioning cost estimates, which are the subject of the financial assurances.

So they are all lining up from our end as far as the expected costs and activities.

**MR. CORMAN:** Jim Corman for AREVA.

Our preliminary decommissioning plan, as it is approved now from the provincial government and CNSC, the cost estimates are consistent with the time forecasts that are

included in that plan.

So there are slightly different durations that what is presented in the CMD document for Key Lake, but the same concept of forecasting the duration of time needed to bring the site to closure is included in the costing.

**THE PRESIDENT:** Thank you.

Mr. Tolgyesi?

**MEMBER TOLGYESI:** On the Staff presentation slide, Slide 49, you were saying that the Key Lake operations the above-ground tailings facility has not received tailings since 1996.

Do you expect that some tailings will be placed on the above-ground facility? And if yes, what will it involve for Key Lake?

**MR. LeCLAIR:** We have not received any requests in any applications for them to place tailings at the above-ground tailings facility. All the tailings are currently going to the in-pit.

If Key Lake were ever to consider that, they would have to apply for it. They certainly haven't said that to us. Currently, the above-ground tailings facility is being used to receive contaminated materials/equipment that are

wastes generated on site, they are stored on top of the above-ground TMF.

Perhaps Cameco can comment if they have any plans for using the above-ground tailings facility. But we certainly haven't -- they haven't communicated any intentions to us of any intent to use it for tailings.

**MEMBER TOLGYESI:** Cameco, do you have any...?

**MR. MOONEY:** It is Liam Mooney, for the record.

And we just received the environmental assessment approval to raise the capacity of the in-pit tailings management facility at the Key Lake operation.

So we will be pursuing that. At this time we don't have plans to use the remaining space available in the above-ground tailings management facility at Key Lake.

**MEMBER MCEWAN:** Thank you, Mr. President.

Can I ask a couple of questions again about the trout toxicity test?

So it is a binary test, 50 per cent, you pass or fail on the basis of that.

Are there any remediation activities or any monitoring of activities that would occur between 50 per cent and 25 per cent or 25 per cent and 15 per cent, or is it literally binary and nobody really worries if less than 50 per cent of the trout are dying?

**MS DOWSLEY:** Barb Dowsley, for the record.

There is no regulatory requirement to investigate that by Environment Canada. But I would pass that question to Cameco and AREVA as to whether in between 50 and 100, whether it tweaks them as to they do further investigation. My guess is yes.

**MR. MOONEY:** Liam Mooney, for the record.

And we talked about our core priorities including protection of the environment and workers as well as the public. In that context, we would look at those sorts of results with some interest and look if there are any anomalies, particularly if it was repeated in a couple samples in a row.

That being said, that sampling program also covers off a number of other

constituents of potential concern, and so that would be another indicator if you were seeing it. So it is just not the rainbow trout, the pH is also part of that discussion as well as those contaminants are concerned.

**MEMBER MCEWAN:** Thank you.

So another question. Again, this is a sort of philosophical question, page 76. The Deilmann tailings management facility, the statement is:

"The CNSC licence condition required a plan to stabilize the slope in a timely manner."

If I understand the timing of this from the diagram and from the discussion, it took five to six years to do that? Am I correct in that interpretation and is that timely and realistic, given the geography and the facility?

**MR. LANGDON:** Mark Langdon, for the record.

We had -- as it says in the report here, there was a number of sand sloughing events between 2001 and 2009. They kept monitoring these, they were doing studies to find out why the

sloughing was taking place, they did a few studies.

Once they finally came up with findings, came up with what they thought the reasons for the sloughing events were, they then put together a plan which took about a year, I believe, put together a plan on how they were going to address it. They came up with two options; one was taking the slope and cutting it all back and the other one was buttressing. In the end they did a little bit of both.

The actual sand cut-back took a full year, there was a lot of sand there. I believe it was -- I think they spent \$35 to \$40 million in digging the sand out, excavating.

As to the total amount of time that it took to sort of do it, I think it was mostly they had to figure out exactly why it was occurring first, what were the problems that it would be causing and they took it quite seriously because the sand sloughing into the pit changes the nature of how -- the long-term nature of the contaminants sort of leave from the tailings.

If you had the sand go right across the entire pit, then you would have water



flowing in between the tailings and it would increase a lot of the leaching, I guess you call it, of contaminants.

So the whole model was based on a compressed hard high density tailings and the water would flow around.

So they did they take this very seriously and none of the sloughing events did cause a total water through there, it was more like patches that went in, so it would be like a cave, so the water would just sort of push on it, it wouldn't flow through.

But perhaps Cameco could expand a little more on the length of time it took.

**MR. LeCLAIR:** Perhaps before we pass it back to Cameco. So the process for doing this had to be very carefully done. There were a number of issues also surrounding the safety of the operation.

Obviously it requires the use of heavy equipment on the slopes to re-stabilize them. It is important that they do not approach this in a light fashion because of the conventional hazards to workers themselves in doing the work, but I believe Cameco can elaborate

a little bit further.

So that yes, it did take a number of years, but part of that, an important consideration was safety considerations in going about doing it in a safe way and there was a number of facilities and things that needed to be moved in order to allow the work to be done.

So I'll let Cameco, perhaps they can elaborate a bit further.

**MR. MOONEY:** It's Liam Mooney, for the record.

And in relation to the time in question, as Mr. Langdon pointed out, there was a number of studies that were conducted to understand what was going on.

That being said, a water management strategy was adopted in the facility to lower the risk of sloughing events into the facility itself.

As the CNSC staff report points out, while there were some minor health and safety risks to workers potentially and to infrastructure on the site, it was more about the tailings capacity and the business risk that was associated with loss of tailings capacity, which you can

appreciate is a significant financial risk to the organization.

So that speaks to the time and the studies that were put in place to ensure that this extremely important asset was managed appropriately.

Ultimately when it was determined to do, as Mr. Langdon says, a little bit of cutting back the slope and a little bit of a total buttress, the work proceeded over the course of two years. There was a good deal of material that had to be removed and some pre-work as far as infrastructure being moved back from the crest of the pit.

Ultimately it was done and done safely and was a success story. From the project management side of things, it was done in the time expected and has been stable ever since.

**THE PRESIDENT:** Okay, thank you.  
We're going another round.

Anybody?

Any other...? Go ahead.

**MEMBER TOLGYESI:** The one I think is somewhat of a typing error, I don't know where exactly. When you compare page 10 and 119, you

are going to total number of the nuclear energy workers, the table, at Key Lake; at page 10 you have 1,321 and at page 119 you have 1,380. So I think is typing error somewhere, right? I don't know which one.

But my question -- I'll wait a minute, let you find that. Page 119 it's on the top of the page, 2,013.

**MR. LeCLAIR:** Yes, it's noted, yeah.

**MEMBER TOLGYESI:** Okay. My question is, that when you are talking about -- at page 29 you are talking about full-time equivalent employees and on page 10 on the Table 21 you are talking about total number of nuclear energy workers.

I'm a little bit confused. How do you correlate these two? Is the full-time employees, it includes employees and contractors, nuclear energy workers and non-nuclear energy workers; am I right?

**MR. LeCLAIR:** So the nuclear energy workers part is just the nuclear energy workers, but yes, on the full-time equivalent workers in terms of conventional safety

statistics, it includes all workers, contractors -  
-

**MEMBER TOLGYESI:** Nuclear energy and non-nuclear energy workers?

**MR. LeCLAIR:** -- nuclear energy workers and non-nuclear energy workers are all included in these statistics.

**MEMBER TOLGYESI:** Because I will take Cigar Lake, it's full-time equivalent is 1,570 and nuclear energy workers it's 3,039 which means contractors I suppose are included and probably they are working part time or what?

**MR. LeCLAIR:** Yes. So basically when you look at the nuclear energy workers, even a worker who might have worked one shift of two weeks under a contract would have been classified as a nuclear energy worker, would be included in the numbers. So these are actual number of people regardless of how many hours or how many weeks they worked at the mine or mill site; while the statistics for the workers on the conventional safety is straight, it's to try to account for number of hours worked for total number of people in terms of statistics.

So when you're comparing one site

to the other, you can compare them relative based on the number of hours worked. So that is why the term "full-time equivalent" is used.

**MEMBER TOLGYESI:** So when you look at that, you are saying that is somebody who is working two weeks, that means it is quite a high turnover; am I right, Cameco?

**MR. MOONEY:** Liam Mooney, for the record.

I would emphasize in relation to the Cigar Lake numbers in particular, which you can see from the table on page 10 it is quite a bit higher than our steady state operations. It was our busiest site and up to -- close to 1,000 people on site during 2013 as we were trying to bring Cigar Lake through construction into commissioning of that particular project.

So it is not so much about internal group, it's more about intense, non-routine contractor activity at the site, particularly over the summer construction months.

**MEMBER TOLGYESI:** Oh, when you say similar in Key Lake, because you have 679 full time and you have 1,380 of nuclear energy workers, only in one place at McClean it is reversed, that

full-time equivalent is higher than nuclear energy workers.

**MR. RICHARDS:** Yeah, Jack Richards, for the record.

What you see there is I guess a reflection of our status over the last few years where we have been shut down, so the amount of work, contractors -- short-term contractors would do was small, therefore, low numbers.

However, we do have a considerable proportion of our workforce is permanent contractors, so these are folks that look after the kitchens in the camps and the janitorial services and that sort of thing. Their staff remained relatively constant, therefore, they show up as full-time equivalents, but they are not nuclear energy workers.

**MEMBER TOLGYESI:** Last time, Mr. President.

What is the relation between when you are looking at one site; the nuclear energy workers and non-nuclear energy workers, what is the proportion?

**MR. RICHARDS:** Jack Richards again.

In an attempt to answer your answer, I wouldn't be able to come up with the numerical numbers off the top of my head, but currently we are running very high nuclear energy workers because of the re-start of the plant, we are looking cautiously at everyone who could even -- there is even a remote chance that they would exceed the 1 mSv per year we have lumped them in with the nuclear energy workers.

So for us at McClean Lake, the numbers will switch quite a bit this year and we will have a very high number of nuclear energy workers. Some categories of jobs may very well fade back out of the nuclear energy worker category.

**THE PRESIDENT:** Okay. Anybody else?

I have, a couple of them are just quickies. On page 12, Rabbit Lake is stable. Why is there no mining licence production limit for Rabbit Lake?

**MR. LANGDON:** Mark Langdon, for the record.

My understanding is they have a milling licence production number, but no mining



licence production number and they only mine to fulfil the milling licence.

I think Cameco might be able to answer that better.

**MR. LECLAIR:** So, just to clarify their licence is a licence for production of yellowcake, so because McArthur River and Cigar Lake do not produce yellowcake, they're just producing ore, their production limits are based on mine production limits.

In the case of Rabbit Lake, it's tied to the actual milling number that covers both the mine and the mill.

And then again, Key Lake and McClean Lake, neither of them have operating mines, so the limit is entirely based on the mill itself.

**THE PRESIDENT:** Okay. Now, you totally confused me because right on top mining, you mine -- I'm still in the Rabbit Lake column, so the number 1559432, I thought that was mining, your mine expresses  $U_3O_8$  in kilograms. So why is there no licence limit?

**MR. LeCLAIR:** So, the limit is tied to the limit for the entire site which you

see at the bottom is the 7.665 million kilograms of  $U_3O_8$ , so it is the same -- this would apply for the entire site.

So that this -- obviously the table is a bit confusing, but basically the site can produce up to 7.666 million kilograms.

**THE PRESIDENT:** Okay. So what is -- the resultant mining licence production limit, does it relate to the 15...

**MR. LeCLAIR:** I think we can be clearer in setting out the table in future reports.

**THE PRESIDENT:** Again, just looking --

**MR. LeCLAIR:** Yes.

**THE PRESIDENT:** -- for a while at this --

**MR. LeCLAIR:** Yes, we can be clearer in the future reports.

**THE PRESIDENT:** Okay. I have another kind of clarity. On page 19, I am intrigued by this McArthur River reference for molybdenum, okay, you use that. Okay, I'm looking at this table. Please try to explain to me how does it work? This is Figure 2.8 and it says:

"Annual average concentration of molybdenum in effluent release..."

Blah, blah, blah.

"McArthur River action level is based on 10 consecutive ponds exceeding the administered level of 1 mg per litre."

Somebody explain to me how that became a reference level?

**MR. LANGDON:** Mark Langdon, for the record.

For molybdenum there is no federal/provincial limits at the moment.

**THE PRESIDENT:** All right.

**MR. LANGDON:** We like to put some sort of a reference on these to sort of give you an idea of what these numbers mean when they are really large or small or whatever.

Each of the sites have environmental codes of practice, so they have admin levels and action levels for different elements.

For molybdenum, they have ponds

where they fill up, treated effluent goes into a pond and they sample it as it goes in, they analyze it and then if it's safe to release, they release it.

Molybdenum level, if they come up with for an action level is it 1.0 mg per litre, this is if their numbers start to get up to that level, they have to take action in their water treatment facility to try to bring that down.

Each of the sites, some of them have their own action levels. When they refer to the admin level, the admin level is 1.0 mg per litre, so if they reach that level internally they take action themselves to try to bring the number down.

**THE PRESIDENT:** But what fascinates me, just to be clear, my question is that you use 10 consecutive --

**MR. LANGDON:** Yes.

**THE PRESIDENT:** -- exceedances, I thought to set up the limit, so --

**MR. LANGDON:** Well, they're exceedances of an admin level, so they start working on it and if they can't get it fixed -- they are working on it and it doesn't fix 10

consecutive ponds then it hits an action level, then they have to report it to the CNSC and explain to us what's going on and we go from there.

**THE PRESIDENT:** (off mic) Sorry.

**MR. DAGHER:** Yes, Elias Dagher, for the record. So the administrative level is based on operational performance, it's a statistical number. By exceeding it 10 times consecutive ponds, that's also related statistically.

The CNSC, an action level is a regulatory tool that's used to indicate if there is potential loss of control from or deviation from the environmental protection program.

So in this case, we don't need to know -- the CNSC doesn't need to know the day-to-day operational fluctuations within the performance of the treatment plant, what we would like to know, however, is that if there is major deviation, so if for 10 consecutive ponds you still have not been able to reduce the concentration of your effluents below that 1 mg per litre, then we would like to be notified as to why.

**THE PRESIDENT:** Okay, let me try the question differently. How did you set up the 1 mg per litre as the reference?

**MR. DAGHER:** Elias Dagher, for the record.

I'd have to go back and check precisely for this site. If memory serves me correctly, it would be based on some statistical performance of the facility, maybe the 95th percentile.

**THE PRESIDENT:** Cameco, you want to help, because then everything else is measured against that 1 mg/L as a reference; right?

**MR. MOONEY:** So it's Liam Mooney, for the record.

And I didn't want to confuse the issue, but the 1 mg per litre is the admin level. So the conversation around 10 ponds and the action level, we just focus on 1 mg as the admin level, that red line shows you our performance vis-a-vis what is a very low level and if we exceed it, it would require us to start to do something.

Where it comes from is our 2005 Environmental Risk Assessment of the McArthur River operation and that would have looked at the

potential for effects in the downstream environment and would have given us the information to develop our environmental code of practice that would have the admin level at 1 mg per litre and the action levels that were discussed previously.

**THE PRESIDENT:** So there's still not any Environment Canada or Saskatchewan government kind of standard or limit for this, for molybdenum now?

**MR. LeCLAIR:** That's correct. Each site has its set admin levels and action levels that are based on performance, so there is not a specific limit that has been set by either the province or the Government of Canada.

**THE PRESIDENT:** Okay, two very, very quick ones. On page 31, as much as I like photos, I am curious to know what the saying here is, "Before proceeding, you must..."

Anybody...?

**MR. MOONEY:**

"...take self-rescuer from this cache."

Sorry, I was just reading it for you.

**THE PRESIDENT:** No, that's good, that's good. I actually like those, you know, those big signs, pretty noticeable and the same thing for Key Lake the safety and environment, you know, it's nice to see that they keep monitoring how many days you go without any nuclear accident.

And this is a compliment, I found your table on -- this is staff Appendix G, about reportable spills, thank you for that, that was really good to read, easy to understand.

And last is on Appendix I, concentration of metals in radionuclides in soil, I am somewhat curious as to why the McClean Lake operation for polonium 210, radium-26 you -- no, not polonium, for radium-26 and thorium-230 you are actually exceeding the reference soil quality level.

**MR. LANGDON:** Mark Langdon, for the record.

What they're actually exceeding, it's got a little 2 beside the numbers, these are reference soil quality levels and they're sort of background concentrations that the companies have come up with, like taking samples away from the mine sites. They shouldn't be affected by the



mine. They've come up with an average.

Theoretically if the samples at McClean Lake are being affected, they should be higher than those numbers. If you look right across though, a lot of the numbers for some of the sites are actually lower. So I guess when you get into very low numbers, I guess -- not necessarily the quality, but how accurate you can get numbers to fit. It comes up as a problem in comparison because you're comparing to sort of like a baseline and --

**THE PRESIDENT:** But you can't have it both ways. If this is a reference level that is meaningful, practically all the mines are exceeding the .017.

**MR. LeCLAIR:** So just to clarify, so reference levels are meant to be indications of the average background concentrations, they're not meant to be an indication of a limit.

So what is unaffected area, those are the numbers. So these would be indicated that there's a slight increase, but it's not a limit, it's not a limit, it's background, it's reference levels of the measure of the background concentrations,

So I believe the intent of the table here is to show comparisons of what has been measured to what the background concentrations that are observed across the sites.

**THE PRESIDENT:** But are there no limits with those? There must be limits with these chemicals?

**MS DOWSLEY:** Barb Dowsley, for the record.

The table indicates that for the first three; arsenic, nickel and uranium, there are guidelines. There are Canadian Council of Ministers of the Environment Soil Quality Guidelines based on use, parkland use. There are not equitable guidelines for the radionuclides.

So what we chose to do in this table was to show the concentrations relative to background stations in the area. It is expected that close to waste rock piles -- that close to sources of dust on the operating sites -- that you will see increased levels of contamination. They may not. In a risk assessment context they are not causing any undue risk, but they are part of an industrial site and we do have dust from waste rock piles going onto soils.

**THE PRESIDENT:** But, you know, when you put a table like this and I am in the public reading this, that doesn't give me any safety comfort.

**MS DOWSLEY:** Agreed.

**THE PRESIDENT:** So you really have to spend some time explaining or put some new numbers when it would become a safety issue and compare that to that, because I thought particularly for Ra-226, I thought there were some numbers, if memory serves right, that bells will go if you get close to it.

**MS DOWSLEY:** I will double check on that.

**THE PRESIDENT:** Anything else?

Mr. Tolgyesi...?

**MEMBER TOLGYESI:** Just to say that in spite of all our comments I believe that these records are very good reports and deserve your -- recognition, because you are doing well. You are improving.

So just please keep continuing. Those are good reports.

**THE PRESIDENT:** Okay. Anything, any last thoughts or comments from licensees?

**MR. MOONEY:** We didn't on the substantive, but on the procedural, President Binder, we were going to ask you. I have a number of people here from AREVA who would be interested in the Mount Polley update, which I know is later on the agenda. And we would be prepared to step down the Beaverlodge scheduled, which is supposed to be up next, to facilitate their sooner departure. We are going to be here for the duration, in any event.

So we were going to suggest, potentially on your agenda, if it would be okay to move the Mount Polley update up and put Beaverlodge behind it.

**THE PRESIDENT:** I think we are -- we are also staying here for the duration. So by all means, let's see if we can accommodate.

So the next one we will do -- is it okay with you guys? We can do the Mount Polley update and then go to Beaverlodge? I don't. Oh, we will take 10 minutes for sure.

**MR. NEWLAND:** We are fine.

**THE PRESIDENT:** We will take a 10-minute break.

**MR. NEWLAND:** And then Mount

Polley.

**THE PRESIDENT:** Okay, sounds good.  
You can set up.

--- Upon recessing at 6:27 p.m. /  
Suspension à 18 h 27  
--- Upon resuming at 6:39 p.m. /  
Reprise à 18 h 39

**CMD 14-M66**

**Oral Presentation by CNSC Staff**

**THE PRESIDENT:** Okay. The next item is an update from CNSC staff on the Mount Polley tailings dam breach as outlined in CMD 14-M66 and it is still Mr. Newland.

Go ahead, please.

**MR. NEWLAND:** It's still me.

--- Laughter / Rires

**MR. NEWLAND:** So good evening, Mr. President, Members of the Commission.

For the record my name is Dave Newland, Acting Director General of DNCFR.

With me today are Mr. Jean LeClair, Director, Uranium Mines and Mills

Division; Don Howard, Director, Wastes and Decommissioning Division, and we have assorted other people behind us to help with the presentation on questions should they arise.

CNSC were requested to provide a summary of the actions taken by CNSC staff and licensees in response to the event at Mount Polley, and this is our update.

Just in summary, CNSC licensees have responded to an information request that CNSC staff sent with respect to conducting verification inspections and confirm that the above ground tailings management facilities are stable and safe. The CNSC staff will continue to conduct compliance verification activities as part of our baseline compliance program to confirm safety at the sites, moving forward.

So first I would like to provide a sort of timeline and a little bit of a description about the Mount Polley mine. Mount Polley is an open pit copper-gold mine located in south-central British Columbia. A tailings breach at the tailings pond occurred on August the 4th, 2014 when approximately 10 million cubic metres of water and 4.5 million cubic metres of slurry were

released into Polley Lake and surrounding waters. I have a diagram of that in the next slide.

I would like to further note that the British Columbia provincial government initiated in August an independent engineering investigation, an inquiry into the tailings breach. The investigation report is due to be completed January 2015 and at that time staff and the licensees will evaluate the findings to determine any lessons learned for the uranium mines tailings facilities and at that time we would make a decision as to whether to come back and update you further.

This figure shows two NASA aerial photographs, one taken on July the 24th and the second taken on August the 5th. To give you a sense of the magnitude of this breach, you can see that in the left-hand corner of the photos there is an indication of a 1 km scale.

The breach can be seen towards the top of the -- on the right-hand photo can be seen towards the top of the retention basin, which is in the lower part of the photo, with breached material shown in sort of a white gray kind of a format. And you can see that it has progressed

into Polley Lake, Hazeltine Creek which is down to the right, and then entering into Quesnel Lake also. That was taken on August 5th.

Next, please.

So this depicts an overall timeline of the event occurring on August 4th, our request on August 14th for written -- for responses from the licensees. All of the licensees had responded by September 15, which was as requested in our letter and here we are today updating you on October 1st.

As a part of the continuous learning philosophy, the CNSC expects licensees to review lessons learned from other events and incidents, both nuclear and non-nuclear.

So on August 14th CNSC requested our licensees with aboveground tailings management areas to take the following actions:

First, review the cause of the breach and confirm the safety case for the facility;

Second, confirm that inspections and monitoring as required in the license conditions handbook have been completed;

Three, confirm mitigation measures



are in place if necessary;

And fourthly, report any identified gaps.

On September 15th all licensees had responded, confirming that their facilities are operated as designed, the safety cases remain valid and that no gaps have been identified. They also confirmed that geotechnical inspections are completed as required by the license conditions handbook.

In addition, CNSC staff have conducted independent inspections to confirm that the above ground facilities are in stable and safe condition and we have concluded that the risk of dam failure for these facilities is very low. CNSC staff will continue to verify compliance through our independent review of the geotechnical reports and by conducting independent inspections of aboveground facilities and the associated sites.

Next, please.

The remainder of staff presentation will be divided into two parts. The first will be to provide information on active uranium mines and mill facilities located in

Northern Saskatchewan and the second on closed historic uranium areas located in Elliott Lake and Bancroft, Ontario.

I will now turn the presentation over to Mr. Jean LeClair to talk about the aboveground tailings management areas in Saskatchewan.

**MR. LeCLAIR:** Thank you, Mr. Newland.

My name is Jean LeClair and I am the Director of the Uranium Mines and Mills Division.

Before I proceed with the discussion on the above ground tailings management areas in northern Saskatchewan, I will just quickly go over CNSC requirements with regards to tailings dams.

This first slide provides an overview of CNSC requirements for uranium tailings dams that are currently in use at both operating uranium mines and decommissioned mines. Any retaining structure to be used at a nuclear facility must meet the requirements set out in the *Nuclear Safety and Control Act*, the *Regulations* and the supporting regulatory documents.

The tailings management facilities, including tailings dams, are reviewed as part of a safety analysis that is conducted at each of the stages of licensing going from initial site preparation and construction, moving through operations and into final decommissioning and long-term monitoring and maintenance.

In specific reference to tailings dams, the safety case will examine the long-term performance requirements of a tailings dam to address both normal and off-site conditions such as major precipitation events. The safety case sets out the design objectives and performance criteria for the tailings dam. More specifically, tailings dams are expected to be designed and constructed to meet the best practices as defined by the Canadian Dam Association.

During operations all licensees are required to have independent geotechnical inspections of their tailings dams. These are done by qualified professionals either from engineering consulting firms or the licensee's corporate offices. The inspection reports are submitted to CNSC staff for a review and follow-up as required.

In addition, CNSC staff inspect tailings dams during routine inspections supported by geotechnical experts. The picture on the right shows a typical tailings dam, while the diagram on the bottom right is an example of the design of a tailings dam at a tailings management area in Elliott Lake.

This next slide focuses on the current situation for our tailings management areas with tailings dams that are located in Saskatchewan. There are three facilities with above ground TMAs; Key Lake operations, Rabbit Lake and, finally, Cluff Lake.

The Rabbit Lake and Key Lake above ground TMAs are currently operating uranium mining and milling sites, while the above ground tailings management area at Cluff Lake is at a decommissioned mine and mill site. None of these above ground facilities are currently receiving tailings. They do not have water covers and are regularly inspected by both qualified professionals and CNSC inspectors.

In response to the incident at Mount Polley, CNSC staff conducted an assessment of the risk of a similar event occurring in

uranium mines and mills in northern Saskatchewan. This included revisiting the geotechnical report submitted by the licensee as required by the license and license condition handbooks, reviewing groundwater piezometer data and conducting independent inspections. These inspections included a walk-down, plus review, of licensee geotechnical reports for 2012 and 2013, a verbal communication on the 2014 report and review of groundwater and piezometer reports. As a result of these assessments, CNSC staff conclude the risk of dam failure is very low.

In response to the CNSC request, Cameco and AREVA provided a detailed response. Licensees confirmed that the safety cases remained valid. Operations inspections and monitoring have been conducted in compliance with the license conditions handbook and the license. The geotechnical inspections have been completed on the defined intervals.

The tailings design differ -- it's important to note the tailings designs differ significantly from that at Mount Polley as the tailings are dewatered, consolidated and there is no water cover. The other thing that may be worth

noting is the size of the dam in Mount Polley has seen numbers of 34 metre high tailings dam elevations, while the dams in the currently operating mines, I believe the tallest is about 15 metres, so half the height.

Their review determined that there were no major gaps identified. The TMAs are operating as designed and the safety case remains valid. The licensee also has conducted regular inspections and completed the monitoring programs. The TMAs continue to operate safely.

So going now from a site-by-site basis, the Key Lake above ground TMA was in operation from 1983 to 1996. The tailings are dewatered and consolidated, as I mentioned previously. As you can see in the photo, there is no water cover. This is at the top right corner. There is a picture there, you can see the tailings there.

As a result of the Mount Polley incident, a dedicated inspection of the above ground TMA was conducted on September 2nd and 3rd by CNSC staff. The inspections supported the geotechnical report conclusions that the TMA remains stable with a low risk of failure.

The Rabbit Lake above ground TMA was in operation from 1975 to 1985. The tailings also are dewatered and consolidated. As you can see in the photo on the bottom right, there is no water cover. There is a bit of water that's visible, but it is actually associated with slight accumulations from precipitation. This water is actively managed by seasonal pumping.

Annual geotechnical inspections are completed by qualified professionals from a corporate office, as per the requirements in the license conditions handbook. CNSC staff review the results of these annual inspections.

Regular inspections and monitoring have been completed by Cameco and independently verified by CNSC staff. As a result of the Mount Polley incident, a dedicated inspection on the above ground tailings management area was conducted on August 11th and 13th by CNSC staff. The inspections supported the geotechnical report conclusions that the TMA remains stable with a very low risk of failure.

The Cluff Lake above ground tailings management area was in operation from 1981 to 2002. The tailings are dry, dewatered;

consolidated. And as the Cluff Lake facility is decommissioned, an engineered vegetative till cover has been installed, as you can see in the picture here. The vegetation has established well on the TMA and is functioning as designed.

As you can see in the photo, there is no water cover. Biannual -- so every second year geotechnical inspections are completed by a qualified professional as per regulatory requirements. CNSC staff review the results of these inspections and the reports. Regular inspections and monitoring have been completed by AREVA and independently verified by CNSC staff.

As a result of the Mount Polley incident, a dedicated inspection on the above ground TMA was conducted on August 26th by CNSC staff. The inspections supported the geotechnical report conclusions that the TMA remains stable with a low risk of failure.

I will now turn the presentation over to Don Howard who will talk about the decommissioned historic tailings management areas in Ontario.

MR. HOWARD: Thank you. For the record, Don Howard, Director of the Waste and



Decommissioning Division.

I will start with Elliott Lake. There are 12 decommissioned uranium mine sites with 10 uranium tailings management areas, or TMAs, in and around Elliott Lake. All of the Elliott Lake uranium mines were brought into production between 1955 and 1958. By 1970, five of the mines had been shut down and by 1992 most had ceased operations.

Decommissioning of all of the Elliot Lake uranium mines was completed by the end of 1999. All of the sites have been fully decommissioned with all mine features capped or blocked, all facility structures demolished and all sites landscaped and revegetated.

The Bancroft area. The uranium tailings management areas in Bancroft exist at the decommissioned Madawaska, Dyno and Bicroft mines near Bancroft. These mines operated between 1956 and 1964. Madawaska was reopened from 1976 till 1982 before being decommissioned under an AECB decommissioning license.

The third location in Ontario is Agnew Lake which is located near Sudbury, Ontario. The mine operated between 1978 and 1983 under an

AECEB license. Decommissioned followed closure.

So now I will concentrate on Elliott Lake. Rio Algom Limited is responsible for nine decommissioned mine sites and their associated TMAs, while Denison Mines Incorporated is responsible for three decommissioned mine sites and their TMAs. In Elliott Lake the TMAs use a mixture of dry and wet cover. Four of the TMAs are engineered with dry covers and vegetation has been established over the tailings at all of these sites. Photo one shows an aerial view of the Pronto site, which is dry covered tailings.

The other five TMAs are water covered and require ongoing water treatment. Photo two shows an aerial view of the Quirke TMA, which is water covered tailings.

In response to the CNSC request, Rio Algom and Denison provided detailed responses. The TMAs are operating as designed and the safety case remains valid. The licensee conducted regular inspections, the spillways are visually checked on a daily basis; the dams are visually checked on a monthly basis.

In accordance with their licenses, all TMAs are inspected annually by the licensee's

geotechnical consultants. The resultant geotechnical reports are reviewed by CNSC staff.

No items of concern exist. Any of the consultant's recommendations are implemented by the licensee. The facilities continue to operate safely.

In addition, Denison and Rio Algom sites conform to the Canadian Dam Association requirements for a seven-year dam safety review by an independent third party. The dam safety review is a systematic review and evaluation of all aspects of design, construction, maintenance, operation and other factors, processes and systems affecting a dam safety. These reports are submitted to the CNSC and the latest one was in 2014. CNSC staff's review have not raised any concerns.

CNSC also ensures compliance through annual baseline compliance inspections of all aspects of these closed facilities. CNSC geotechnical specialists inspect the dams at the decommissioned Elliott Lake site every three years. The most recent was completed in August 2014. There are no outstanding compliance issues at any of the sites.

Therefore, CNSC staff confirmed that the tailings management facilities in the Elliott Lake area are stable and safe.

Bancroft. All of the TMAs at these sites are vegetated and covered tailings, meaning there is no water cover. In response to CNSC requests, the licensees, consisting of EWL Management Limited and Barrick Gold Corporation responded to CNSC request. The tailings management facilities are operated as designed and the safety case remains valid. The licensees conduct regular inspections during the spring, summer and fall. The dams are visually checked on a monthly basis.

In accordance with their licenses, all TMAs are inspected by the licensees' geotechnical consultants. Any of the consultant's recommendations are implemented by the licensee. The resultant geotechnical reports are reviewed by CNSC staff and no items of concern have been raised. The facilities continue to operate safely.

CNSC also ensures compliance through annual baseline compliance inspections of all aspects of these close facilities. CNSC

geotechnical specialists inspect the dams at the decommissioned Bancroft site every three years. The next scheduled inspection will be in October 2014. CNSC staff confirm that the tailings management facility in the Bancroft area remain stable and safe.

Agnew Lake, which is operated by the Ministry of Northern Development and Mines is located near Sudbury Ontario. The mine operated between 1978 and 1983. Then it was decommissioned after that.

One TMA exists. It has a low-lying dry vegetative cover with one dam and a low retention structure downstream to ensure that in the unlikely event of a failure tailings will be contained adjacent to their current location. The Ontario Ministry of Northern Development and Mines responded to the CNSC request by September 15th. The tailings management area is operating as designed and the safety case remains valid. The dams are visually checked on an annual basis.

In accordance with their license, the TMA is inspected every five years by the licensee's geotechnical consultants. Any of the consultant's recommendations are implemented by

the licensee.

The resultant geotechnical reports are reviewed by CNSC staff and no items of concern have been identified. The site continues to operate safely.

CNSC staff also ensures compliance through their annual baseline compliance inspection. CNSC geotechnical specialists inspect the dam at the decommissioned Agnew Lake site every three years, with the most recent geotechnical inspection occurring in August 2014 and no outstanding compliance issues were identified. Therefore, CNSC staff confirm that the tailings management area at the Agnew Lake site is stable and safe.

I will now turn the presentation back to Mr. Newland.

**MR. NEWLAND:** Thank you, Don.

So to conclude, as part of continuous improvement the CNSC expects licensees to review other events and incidents such as these and this is why we requested information from our licensees. Licensees have provided that information by the due date.

CNSC staff have concluded that the

risk of dam failure is very unlikely due to strict engineering requirements and rigorous regulatory oversight. CNSC staff will continue to verify compliance through regular review of geotechnical reports and follow up on the recommendations and regular inspections of the tailings facilities.

That concludes staff's presentation and we are available to answer any questions you may have. Thank you.

**THE PRESIDENT:** Thank you.

Does Cameco or AREVA want to add any comment on this now?

**MR. MOONEY:** It's Liam Mooney, for the record, President Binder, and we do have just a short opening statement on this.

Good evening, President Binder and Commission Members.

Again, for the record, I am Liam Mooney, Cameco's Vice President of Safety, Health, Environment Quality and Regulatory relations. And with me tonight I have Kevin Nagy, our Director of Compliance and Licensing for our Saskatchewan Mining Divisions.

Cameco has closely monitored the situation at Mount Polley and understands the

importance in internalizing the lessons learned in a systematic manner consistent with our management systems. A use of experience event has been entered into our Cameco incident reporting system and that will be completed once the Mount Polley investigation report is completed in 2015.

We did provide a comprehensive response to CNSC staff's questions, the details of which are reflected in CNSC staff's presentation today.

To summarize this response, these facilities are no longer actively used for tailings deposition and they are monitored and routinely inspected. As a result, we are confident in the long-term stability of the above ground tailings management facilities at both our Key Lake and Rabbit Lake operations.

Thank you, and we are pleased to respond to any questions that you may have.

**MR. HUFFMAN:** For the record, this is Dale Huffman. I am the Vice President for Safety, Health, Environment and Quality Resources.

AREVA also provided a response to this CNSC's request following the Mount Polley incident. To briefly summarize, I think the staff



did a good job of summarizing the Cluff Lake site, but I guess I will reiterate.

So AREVA's only above ground tailings management facility is at the decommissioned Cluff Lake site. The tailings management facility is closed, the tailings have been consolidated, dewatered and covered with a dry cover system and re-vegetated. There is no pond above the tailings. The TMA is stable and safe and inspected regularly.

We also look forward to the lessons learned report that will come out in January so that we can learn from the experience at Mount Polley as well.

And I am available to answer any questions. Thank you.

**THE PRESIDENT:** Okay. Thank you.  
So let's open it up.

Dr. McEwan...?

**MEMBER MCEWAN:** Thank you,  
Mr. President.

So this is just trying to understand. When it has been re-vegetated and dewatered it is absolutely dry or is there a sort of slurry left for the tailings?

**MR. LECLAIR:** So once the cover has been placed over top of the tailings, the tailings are essentially dry. There is some accumulation of water that would come from precipitation and snow melt, but the cover is designed so that the water will run off the cover rather than accumulate and pond onto the surface of the tailings.

**MEMBER MCEWAN:** So this is effectively solid ground behind the dam and under the vegetation?

**MR. LECLAIR:** That would be correct.

**THE PRESIDENT:** Just so I can understand, I'm looking at the Key Lake and Rabbit Lake and Cluff Lake now. So you say they are not underground. They are covered so there is no accumulation of precipitation and snow that will create a whole new lake here.

**MR. LECLAIR:** So to differentiate, the Cluff Lake is the one that has the cover placed over it. It is the decommissioned tailings facility.

So speaking just for the ones in Saskatchewan, while Key Lake and Rabbit Lake, they

don't have a cover on them, so any snow melt or any precipitation that accumulates on the tailings is collected. It's pumped and it's treated for removal of contaminants before it's released into the environment. So they have a set freeboard. On a seasonal basis they will remove water that may pond on the tailings. It's part of a routine operation.

**THE PRESIDENT:** So they actually treated. So how high are the boundaries on things like Key Lake, the dam, the walls?

**MR. LECLAIR:** I would ask -- perhaps Cameco and AREVA might be better positioned to give you the details in terms of the actual height of their dams and some of the more technical details you might be looking for.

**MR. MOONEY:** Sure. It's Liam Mooney, for the record.

In relation to the Key Lake AGTMF, as an example, in our response to the CNSC, it maps out the actual size of the facility is 800 by 700 meters with a maximum height of approximately 20 metres.

In switching over to the Rabbit Lake AGTMF, it's 1270 metres by 500 metres in

size, with the depth of about 25 metres.

**THE PRESIDENT:** So what I'm trying to understand, even though it is so-called dewatered and dry, there still could be a significant runoff coming out of these facilities. Is that correct or am I misreading this?

**MR. MOONEY:** Liam Mooney, for the record.

For the AGTMFs at Key Lake and Rabbit Lake water is collected and treated in the mill facility that is located adjacent to the tailings management facilities in those two instances.

**MR. HUFFMAN:** And Dale Huffman here for AREVA.

To differentiate the Cluff Lake facility, it is a closed facility with a cover system over top so there is no collection and treatment. It sheds water from the cover surface and it is snowmelt and rainwater. It's good water. So we don't have perpetual treatment.

**MR. LECLAIR:** Mr. Binder, I would just like to provide a clarification just to perhaps assist in the discussions.

When we refer to consolidated

tailings, to differentiate them from the current situation at Mount Polley, tailings when they are pumped into the above ground tailings facility they are pumped as a slurry. They are about 30 to 35 percent solid, so the best way to describe them is they are sloppy. They are wet. They pour. They are pumped. They need to be moved. So they are pumped as a slurry.

Over time as the tailings consolidate the water will start to pool up at the surface and then that water can be removed and treated. So in the situations that we are dealing with at the uranium mines and mills in northern Saskatchewan, the tailings have consolidated so they have compacted. The pore waters, most of the pore waters come out of the tailings so that the tailings masses is like a solid mass of tailings as opposed to an actual slurry. So it wouldn't have lots of water and would not flow.

The current situation is those tailings would not flow readily because they have consolidated and most of the water is out of them.

**THE PRESIDENT:** Mr. Tolgyesi...?

**MEMBRE TOLGYESI :** Merci, Monsieur le Président.

You are saying that it's a regular inspection. I'm talking now beginning with the Cluff Lake. It's closed, it's decommissioned, it is restored, re-vegetated. Was it an impermeable cover placed on the top of the tailings?

This is for AREVA because this is your site.

**MR. HUFFMAN:** Okay, thank you. It's Dale Huffman here with AREVA.

No, the cover is not an impermeable cover. It's a simple till cover and it has been re-vegetated. And the re-vegetated surface reduces the infiltration through the cover and the cover is sloped for water to run off through a spillway into the local lake.

**MEMBER TOLGYESI:** And there's no contamination of the water which one part is going through the tailings? I suppose you have a ditch around to collect the water going to the spill and going to the lake?

**MR. HUFFMAN:** We have a monitoring program that measures the sort of water migration through the tailings to determine the contaminant flux to the local lake and we also have water monitored the runoff water to assure that it is

clean water and meets water quality objectives.

**MEMBER TOLGYESI:** If I'm looking at Key Lake and Rabbit Lake, these two operations are in progress. So the tailings pond is alive, you know, because you use it.

Do you do any progress in restoration? Cameco...?

**MR. MOONEY:** So it's Liam Mooney, for the record.

And it is important to differentiate that we have in-pit tailings management facilities at both the Key Lake and Rabbit Lake operation. Those facilities are used for tailings depositions and have subaqueous depositions. So there is a tailings pond on the in-pit at Key Lake for example, the Deilmann Tailings Management Facility.

The above ground tailings management facilities at both of those operations do not have water cover. They have water that may pond seasonally, but that is pumped off and is treated before it is released to the environment. So I just wanted to give you that sense of clarification.

In relation to the ongoing

reclamation activities, because of the ongoing use of those aboveground tailings management facilities for waste disposal, we haven't moved forward with reclamation activities at those facilities. That being said, there has been a good deal of reclamation activities focused on other areas that we have worked towards based on priorities at the different operations.

The example that springs immediately to mind was the work on the Bison waste rock pile that was completed last year in that regard. So there is ongoing reclamation activities and it may be focused on different priorities that are identified through the review of our operations and the continued activities at those operations.

**MEMBER TOLGYESI:** You were saying that the water which is accumulated on the two above ground facilities, you are pumping that. What do you do? You collect the water in the ditch, in the spill or what? How do you do that?

**MR. MOONEY:** It's Liam Mooney, for the record.

I will ask Kevin Nagy. He used to work at the Key Lake operation, he can give you a



sense of how it is managed at the AGTMF there.

**MR. NAGY:** Kevin Nagy, for the record.

At the aboveground tailings management facility at Key Lake there are drains that were constructed into the embankments along the surface of the embankment. So surface water drains through those drains into a collection sump and from there it's pumped back to the mill for treatment there.

At the above ground tailings management facility at Rabbit Lake that water accumulates and lower spots on the tailings surface, it is actively pumped off into the pipeline back to the mill for treatment.

**THE PRESIDENT:** Okay. Thank you.  
Ms Velshi...?

**MEMBER VELSHI:** Thank you.

So again I commend you for using this to see if there are any learnings for us. So one of the things that was certainly evident in the media is that the regulator may not have done as great a job and the presentation here focused very much on the licensees reviewing and coming back to you.

And I know implicit in this review was the requirements are clear, the monitoring and the oversight is good. But if, say, Parliament were to ask the CNSC and say, "Hey, what learnings were there for you as a regulator in how good a job are you doing and are there opportunities to do a better job?" what would the response be?

**MR. LECLAIR:** The response I would have is that we are also waiting for the report to come out on January 31st.

Certainly, we have also heard some statements of potential, "What was the regulator's role?" So once the report comes out we certainly will be looking at it both in the context of what if anything further should the licensee have done in that situation and what if anything further should the regulator have done.

Certainly at this point in time we are confident in what we are doing in terms of the verifications that we have done, the independent verifications that we do, the inspections that we go out and do. The verification reports that we are doing make us fairly confident in terms of where the situation is.

But that being said, once the report comes out at the end of January, we certainly will be looking at it very closely and if it shows anything in terms of potential opportunities for improvement even for us as a regulator, we will certainly be looking at those and acting on them.

**DR. JAMMAL:** Ramzi Jammal, for the record.

Just to add to Mr. LeClair's comment, is if the Parliament asks the CNSC to make a presentation, we will start with that the uranium mine from the cradle to grave has regulatory oversight and we will report to the Commission on a yearly basis.

In addition to the accident or the incident at Mount Polley or not, we conduct very rigorous compliance activity. But as Mr. Leclair mentioned, it is above and beyond what we currently do, above and beyond that we have our geotechnical specialist in place.

We will take any lessons learned out of the investigation and we will re-evaluate to make sure that we did not miss anything. But again, the independent review is ongoing and our

specialists review the reports from the independent review and we go on site inspections.

**MEMBER VELSHI:** Thank you.

Of the third party geotechnical investigation reviews that get sent to you, have there over the years been any findings? Is it usually, "Hey, things are good" or "We have a whole lot of issues that the licensee now has to look at?" What's the nature of those reports generally?

**DR. NGUYEN:** Son Nguyen, for the record.

The geotechnical reports from the third-party review usually comes to a geoscience and specialist staff for a second look for reviewing and most of the issues are mainly related to care and maintenance of the facilities, like a little bit of cracking, some erosion here and there and this kind of thing. The licensee, we give them -- we make sure that the licensees follow up with the recommendations from the third-party reviews.

**MEMBER VELSHI:** Yes, I was getting it in two sides. So one was the kind of findings and is there anything significant and, secondly,

is their value from these third-party reports?

**DR. NGUYEN:** There are a lot of values because this keeps the licensees active on maintaining the site and making sure that the facilities, the dams and the structures are properly maintained and wouldn't present any stability issues. At the same time, the CNSC geoscience specialists also do their own geotechnical inspection in order to make sure that the recommendations from the reports are followed up by the licensee.

**THE PRESIDENT:** But over the years have you come across some real structural -- serious structural deficiencies or issues that the licensee would not follow up on? I mean that's one of the -- in the press you hear about it still, some of the rumours about what happened, and in Mount Polley about noncompliance.

So did we ever come across something like that?

**DR. NGUYEN:** The answer is "no" because we follow the process. From the design of the facility to the specialist, staff has to approve the design and then during construction we would make sure that the construction is

proceeding according to the design and during operation and inspect this as well.

So the short answer is no, actually, because we have a good regulatory oversight from a technical perspective as well.

**THE PRESIDENT:** Thank you.

Monsieur Harvey...?

**MEMBER HARVEY:** Two questions. The first one, when I look at Rabbit Lake, the photo presented there, it seems to have quite a bit of water around on the side. I don't know if I read it correctly.

My point is, how often do you pump the water and is it done on a regular basis or continuously or from time to time when you have some indication that it comes to a certain depth?

Maybe, Cameco, you can answer?

**MR. NAGY:** For the record, Kevin Nagy.

I can't see the picture you are talking about. I don't have the presentation. But I believe when I was speaking about water collecting in the low area at the one side of the Rabbit Lake above ground TMF, that's probably what you are referring to, and the site services crews

will, dependent on precipitation, but they will pump that water down several times during the season.

**MR. GROSKOPF:** It's Glenn Groskopf. I am the Project Officer for Rabbit Lake.

Where that water is designed to pool and be pumped from that's actually not against an engineered earthen structure, it's actually at bedrock high. So again, that's physically stable where it's not going to have any issue with regard to water events, a dam basin.

**MEMBER HARVEY:** Okay. My second question is about the inspections.

You mentioned there is visible inspections and geotechnical inspections. Do you have some kind of instrumentation in those dikes and dams in order to be able to objectively observe if there is some movement or not?

**MR. NAGY:** Kevin Nagy, for the record.

We do. I'm more familiar with Key Lake, having worked there but, yeah, there is a network of vibrating wire piezometers running throughout the embankments that are connected to a

monitoring shelter where that information is collected and used as part of the maintenance and geotechnical inspection of the facility.

**MR. MOONEY:** It's Liam Mooney, for the record.

I think the other point that I would come back to is in the unlikely event of a tailings structure failure, the nature of the tailings, the consolidated nature of the tailings means that there would not be any flow. So we don't have water that would present the risk of over topping the dam, which seems to be what happened at Mount Polley, and we don't have tailings that would ultimately flow given the state of those facilities.

So we do have those additional measures. Those are holdovers from when they were active tailings management facilities, but it is important to appreciate that there is low, very low risk associated with these facilities, even in the unlikely event there were a dam to -- an event like Mount Polley were to occur as far as the dam structure.

**MEMBER HARVEY:** Thank you.

What is the difference of the



visual inspection you mentioned and the geotechnical inspection by the independent?

**MR. NAGY:** Kevin Nagy, for the record. We will do daily inspections -- oh, sorry. Was that for staff or for Cameco?

**MEMBER HARVEY:** Well, I was, yeah, driving my question to the staff, because they mentioned that they had an independent geotechnical survey.

And what is the difference? You also go there and have visual inspections. What's the difference between them both?

**MR. LeCLAIR:** So someone who is not a geotechnical expert who doesn't have the expertise can do observation and will be able to observe things; might be able to see a crack in a tailings dam for instance, but would not necessarily appreciate what the significance of that was. The geotechnical expert, by his expertise -- and perhaps Son can discuss it further -- has expertise and knowledge and understanding of dams, how they operate and what are some of the features to look at to see.

The other thing that was mentioned was the instrumentation and the analysis of those

results. I certainly myself could not analyze that data and understand exactly what it meant. However, my colleague here behind me, I am very confident would, and he can perhaps talk about that side of it a bit more.

**MEMBER HARVEY:** Well, I'm asking that question because I used to manage dams and to deal with those kind of problems. And at the beginning -- well, it's years ago. We used to go there and have a visual look at it and so, okay, there is no movement and another year after there is no movement.

But once we -- one day we installed a post and a specific station on dikes and our dams and a dam you are able to see if there is some movement, movement that cannot be detected just by visual inspection. That was the essence of my question, and I understand there is some means to do that.

**MR. LeCLAIR:** Yes. I would agree with you, yes.

**MEMBER HARVEY:** Okay.

**THE PRESIDENT:** Questions? Any more questions?

**MEMBER TOLGYESI:** If we resume

this inspection, there is a daily visual -- daily by owner, that's what you were saying, by mine; monthly, once again it's a visual by the owner I suppose. There is an annual by CNSC staff. It is an annual also by the owner. There is the geotechnical. It's a third party. It's every year or every two years. Am I right?

**MR. LeCLAIR:** Yeah. We need to differentiate depending on which facilities we are talking about.

My colleague to my left here is having a nice quiet time and, certainly, I'm sure he is enjoying it. It depends on the actual site.

So if we are actually looking at -  
- for instance, if you are looking at Rabbit Lake and Key Lake they are actually operating mines. We are doing -- well, we provided you the actual number of inspections that we do. As part of routine inspections, we will do a walkabout to reference what you were saying. We do that observation.

Then there is also the support that's provided through the geotechnical specialists. At the operating sites there are staff that are there full-time and they have set

inspection requirements that certainly Cameco and AREVA can speak to more.

However, when we are looking at some of the sites that Don's group deals with, those inspection frequencies might be less simply because the facilities aren't active, in some cases there are people there all the time. In others it depends on the actual site.

**MEMBER TOLGYESI:** Is there -- because usually with these daily inspections and monthly we will do -- somebody is doing that and eventually we will find that nobody did it. Is there a log book or some register that you could consult which is held on the site who was doing that and what he found? Because I was a witness of a dam failure where everybody, even the government was visiting that, even the people were traveling by skidoos and by four-wheel drive, and suddenly there was a dam failure and nobody said anything about it and it was a long building process.

**MEMBER HARVEY:** But we are not dealing with a reservoir that had 20, 30, 40 feet of water and with pressure, it's a very small thing I suppose.

**MR. LeCLAIR:** Well, again, to put things into perspective is, so he has shown the three tailings facilities in Saskatchewan, I believe Don here is showing you the Elliott Lake situation that has surface water covers, I don't know what -- the depths of those. Don can speak to those a bit better.

But certainly for the operating uranium mines and mills, the ones that we have seen in Saskatchewan, again, they don't have water covers which is -- and they don't have substantial amounts of water there being held up and the facilities are relatively small, speaking in scales of mines, I guess, and obviously you have got to qualify that a bit.

Maybe Don wants to add something here so he doesn't feel left out.

**MR. HOWARD:** No, it's okay, I'm comfortable.

--- Laughter / Rires

**MR. HOWARD:** No, I think Jean is correct in that the dry covered tailings is potentially not an issue.

In Elliott Lake we do have some covered tailings areas and some of them are fairly

large. They do have water treatment systems in place and they do a lot of water treatment.

Also, in Elliott Lake they have what they call the operational monitoring programs which looks at -- tracks the performance of the tailings management area and then basically it helps to support decisions regarding the management and discharge compliance of the TMAs. So the licensee is required by the licence and the license conditions to do a lot of inspections and they are required to report their findings to the CNSC.

On our side as the regulatory body we do verify through compliance inspections. For Elliott Lake and Bancroft we do what we call a Type II general compliance once a year where an inspector will just walk around and do some visual inspection and then we have our geotechnical specialists who go out every second or third year to look at the actual dams themselves.

This is in conjunction with the independent third-party that the licensee is required to engage and submit reports. And we look at those reports in any of the recommendations that the third-party does put

forward. We ensure through our Compliance Verification Program that the licensee is actually taking action and implementing those recommendations.

**THE PRESIDENT:** Okay. I think we need to move on.

So again, I think that as long, as Don just said, the licensee is conscious of the requirement and we are conscious of the inspection requirements to verify -- so it's a trust-and-verify concept -- I think we are doing what we set out to do.

But I think I will be remiss. I need to ask that question. So what happened to McLean Lake, McArthur Lake and Cigar Lake? There are no dams, water issues?

**MR. LeCLAIR:** So very quickly then, McArthur River and Cigar Lake our mines. There are no operating mills. They don't produce tailings so they won't have any tailings facilities. All they have are --

**THE PRESIDENT:** There are no water ponds that --

**MR. LeCLAIR:** They have your typical water ponds that are lined ponds that are

used to hold water that you would typically see at all the mines and mill sites. So they are water ponds with liners. They have HDPE liners, so they are ponds.

**THE PRESIDENT:** And if those water ponds broke it wouldn't be the same kind of impact?

**MR. LeCLAIR:** No, it's not at all in the same scale. So that was McArthur.

And then, so what did you say? McArthur, Cigar Lake. There was a third. I'm sorry.

**THE PRESIDENT:** McClean.

**MR. LeCLAIR:** McClean Lake has no above ground tailings facility. They have an in-pit tailings facility. So they don't have an above ground tailings facility at McClean Lake.

**THE PRESIDENT:** Okay. Good. Thank you. Thank you very much.

--- Pause

**THE PRESIDENT:** Okay. Are we all ready for the next one?

--- Pause



**CMD 14-M60 / 14-M60.A**

**Oral presentation by CNSC staff**

**THE PRESIDENT:** So the next item is an update from CNSC staff on Cameco Corporation's decommissioned Beaverlodge Mine and Mill site as outlined in CMD 14-M60 and 14-M60.A.

So we know Mr. Mooney is online.

Is Mr. Keith Cunningham? You're still there?

And I am told here that we may have Mr. Kristoff from Saskatchewan.

**MR. KRISTOFF:** I'm here.

**THE PRESIDENT:** Oh, great. So everybody -- everybody is on. So Mr. Newland, over to you.

**MR. NEWLAND:** Good evening. Mr. President, Members of the Commission, my name is David Newland, for the record.

With me are Jean LeClair, Director of the Uranium Mines and Mills Division; Robert Dwyer, Project Officer within the same division, and the rest of the CNSC licensing team, what's left of them, for the project.

In April 2013 a public hearing was

held to discuss the license renewal for the decommissioned Beaverlodge Mine and Mill site which is managed by Cameco Corporation.

The Commission was updated on the process that was followed to select remedial options for the site, the final options that were selected, how performance would be evaluated and the process for transferring properties into the provincial institutional control program.

Over 20 supporting studies were completed since 2009 which have contributed to the development of this path forward, which concluded that the licensee identified reasonable options to support the natural recovery of the site. The remedial options that were selected were considered to be good engineering practices and are expected to result in localized improvements in water quality. However, due to the legacy nature of the mining impacts and the size of the Beaverlodge Lake, there were no practical remedial options that would be able to meaningfully accelerate the natural recovery of the Beaverlodge Lake.

In May of 2013 the Commission accepted the path forward and issued Cameco a 10-

year license to proceed with the remedial work and continued management of the properties. CNSC staff committed to come back to the Commission to provide an update in 2014, specifically on defined performance objectives and actual performance indicators for each property and property-by-property timeline estimates for their eligibility to transfer into institutional control.

The following presentation is a summary of the information requested.

I will now turn the presentation over to Mr. LeClair.

**MR. LeCLAIR:** My name is still Jean LeClair and I am still the Director of the Uranium Mines and Mills Division.

Unlike some of the legacy mines in Northern Saskatchewan such as Gunnar and Lorado that will be appearing before the Commission later this year that were abandoned and the Beaverlodge site was actually decommissioned to the standards of the day from 1983 to 1985, the remedial work that Cameco is undertaking currently are enhancements and improvements to what was previously done to ensure that long-term risks have been addressed and managed such that minimal

effort is required to manage the sites under the provincial institutional control program.

I think it's important to remind everyone that the historical mining practices that took place during the operation of this mine site were very different from those you would see in a mine today. Environmental protection standards have come a long way and many of the practices of handling mine wastes would not be acceptable today.

I would also like to assure the Commission that the risk of a tailings dam failure such as the one that occurred at Mount Polley is not an issue at the Beaverlodge site as there are no dams on the Beaverlodge site as the tailings were deposited in natural water bodies during operation, which I wouldn't say necessarily is much better, but there is no dams so we don't have to worry about potential dam failures.

I will now ask Rob Dwyer to continue with the CNSC staff's presentation.

**MR. DWYER:** Good evening, Mr. Chairman and Commission Members.

My name is Robert Dwyer and I am the Project Officer Responsible for Managing the

Licensing and Compliance activities associated with the regulation of the decommissioned Beaverlodge Mine and Mill site.

I will begin my presentation by providing a site overview that includes a brief history of the file. I will also provide a status update for the activities completed at the site since Cameco's license was renewed in April of 2013.

As Mr. Newland mentioned, we are here today to provide an overview of the information that was requested by the Commission, including clarity on performance objectives and indicators and the timeline for institutional control of transfer eligibility.

Finally, I will present CNSC staff's conclusions.

I will start with the site overview. As shown in the map on the left-hand side of this slide, the decommissioned Beaverlodge Mine and Mill site is located in the northwest corner of Saskatchewan and is approximately 8 km from Uranium City.

In the map on the right the Beaverlodge licensed areas are outlined in red.

Historical mining activities in these areas were conducted within two watersheds, the Ace Creek watershed and the Fulton Creek watershed. The Ace Creek watershed shown in light blue and the Fulton Creek watershed is shown in dark blue. Both of these watersheds feed into Beaverlodge Lake.

There are five main licensed areas, including Hab, Dubyna, Bolger/Verna, Lower Ace Creek, and the Tailings Management Area. There are also three smaller licensed areas, Eagle and two Martin Lake areas which have a relatively small footprint. Each of these areas is a compilation of a number of individual properties. There are a total of 65 individual properties that make up these licensed areas.

Eldorado Nuclear Limited, a federal Crown Corporation operated the site from 1952 to 1982. During the early operations comprehensive environmental protection regulations did not exist. As an example, the site operated without effluent treatment process for approximately 25 years.

Decommissioning was completed in 1985 following the plan approved by both provincial and federal regulatory bodies. The

approval noted that the site was expected to recover in a long term.

Since 1985 the site has been in a state of monitoring and maintenance. In 1988, El Dorado Nuclear Limited and the Saskatchewan Mining Development Corporation, a provincial Crown Corporation, merged to form Cameco. As a result of this merger, Cameco was assigned the responsibility of maintaining and monitoring this site and Canada Eldor Investment Incorporation, a subsidiary of the federal Crown Corporation, Canada Development Investment Corporation, was to provide funding for all the site activities. With Cameco's current 10-year license, a plan has been developed to transfer the site back to the province through Saskatchewan's Institutional Control Program.

During the license renewal hearing in 2009, the Commission issued Cameco a three-year license to develop a clear remediation plan for the site. From 2009 to 2013, annual updates were presented to the Commission which provided details on CNSC staff's compliance activities and Cameco's progress with the development of a remediation plan.

In April of 2013, the final remediation plan was presented to the Commission. Over 20 supporting studies were completed since 2009 which have contributed to the development of the path forward which concluded that the licensee identified reasonable options to support the natural recovery of the site. The remedial options that were selected were considered to be good engineering practices and are expected to result in localized improvements in water quality. However, due to the legacy mining impacts and the size of Beaverlodge Lake, there were no practical remedial options that would be able to meaningfully accelerate the natural recovery of that lake.

In May of 2013, the Commission accepted the path forward and issued Cameco a 10 year license to proceed with their remedial work and continued management of the properties. CNSC staff committed to providing the defined performance objectives and actual performance indicators for each property and property-by-property timeline estimates for institutional control transfer eligibility during an update in 2014.



As described in last year's license renewal hearing, Cameco will be implementing and assessing for main remedial options during the current license term, including the Bolger/Verna stream diversion, plugging boreholes, replacing caps on vertical mine openings and covering accessible waste rock and tailings areas with elevated gamma levels.

The following slides will provide a brief status update on each option. In addition, CNSC staff have provided an update on a recent surface subsidence that occurred in the Lower Ace Creek area.

The first remedial option I will discuss is a stream diversion at the Bolger/Verna area. The purpose of the stream diversion was to re-establish the flow path between Zora and Verna Lakes to minimize contact with the waste rock pile. In 2014, staff reviewed and accepted detailed design of the stream diversion. The 2014 activities focused on physical and chemical characterization of the waste rock pile. The construction of the stream diversion will be completed during the summer of 2015.

CNSC staff inspected the

characterization work that was completed at the site in July of 2014 and verified that it was being completed as described in the application. Moving forward, CNSC staff will continue to verify that Cameco is meeting its commitments through compliance inspections.

The second option is plugging boreholes. All boreholes on the site are to be plugged to prevent the potential for groundwater outflow to the surface. As of April 2013, all identified boreholes on the Beaverlodge site had been sealed. Cameco also committed to seal any additional boreholes found on the site during the completion of their remedial work.

During the summer of 2014 two additional boreholes were located in the Bolger/Verna area and will be sealed by the end of October of this year. These boreholes were not flowing, but will be sealed as a preventative measure. CNSC staff will continue to verify that all boreholes are sealed during compliance inspections.

The third option was to replace caps on vertical mine openings. This includes shafts and ventilation raises. The current

concrete caps on the vertical mine openings will be replaced with new engineered caps with established designs to ensure long-term safety of the site. All caps on vertical mine openings will be replaced by the year 2018.

During the summer of 2014, the conditions of the foundations surrounding the existing caps were assessed by Cameco. CNSC staff observed these conditions during the July 2014 inspection and verified that there were no signs of significant deterioration. Moving forward, CNSC staff will review the proposed shaft cap designs and monitor their installation through compliance inspections.

The fourth and last option was to cover accessible waste rock and tailings on the site with elevated gamma levels. For the purpose of reducing gamma exposure, areas with elevated gamma levels that are reasonably accessible to the public will be covered in accordance with the as low as reasonably achievable principle, or ALARA.

Cameco is scheduled to perform a site-wide gamma scan in September, so they just recently completed it. Once the gamma scan is complete Cameco will assess the results and submit

a final report outlining where remedial work may be required.

To date, CNSC staff have reviewed Cameco's gamma scan procedure and Cameco has responded satisfactorily to all comments provided.

CNSC staff will review the final report provided by Cameco to verify that the accepted plan was followed and that adequate measures are taken to reduce gamma levels where required. CNSC staff will also independently verify the results of the survey through the CNSC's compliance verification program.

In addition to the remedial options, CNSC staff would also like to provide a brief update on a surface subsidence which occurred in the Lower Ace Creek area.

In October of 2013, Cameco reported a subsidence near a surface crown pillar associated with the historical mine workings. A surface crown pillar is a rock mass situated above the uppermost drift in a mine which serves to ensure the stability of the mine workings and the surface. The subsidence was backfilled and access was restricted using temporary metal fence and signage and Uranium City residents were notified.

During the July 2014 annual inspection, it was noted that the backfill material had partially eroded and subsided. Cameco's continued remediation plan includes completing a geotechnical and geophysical evaluation of the area to determine the extent of the voids, crown pillar and the overburden thickness. The results of these evaluations will provide the basis for further remediation and/or monitoring.

CNSC staff will review the final remediation plan and verify its implementation during future compliance inspections. CNSC staff have reviewed the actions taken to date and find them acceptable.

In the record of proceedings issued in May of 2013, the Commission requested that CNSC staff provide further clarification on the performance objectives and actual performance indicators to decommission Beaverlodge Mine and Mill sites. In response to the Commission's request, Cameco has further developed and clarified their performance objectives and indicators. The overall intent of how the properties will be evaluated has not changed since

the April 2013 license renewal hearing. The performance objectives for the Beaverlodge licensed properties is that they be safe, secure, stable and improving.

Safe. The site is safe for general public access. This objective is to ensure that the long-term safety is maintained.

Secure. There must be confidence that the long-term risks have been assessed by a qualified person and are acceptable.

Stable and improving. Environmental conditions on and downstream of the decommission properties are stable and continue to naturally recover as predicted.

Performance indicators will be used to verify that the performance objectives are being met. The performance indicators used to determine if a site is safe and secure include ensuring that there are acceptable gamma levels, boreholes are plugged, caps on vertical mine openings are stable, crown pillars have a low risk of causing a surface subsidence, and the site is free from historical mining debris.

The stable and improving objective is more relevant to monitoring water quality. In

order to verify that conditions on and downstream of the properties are stable and improving, Cameco will continue to monitor the water quality to confirm that their remedial options are effective in assisting the natural recovery in accordance with the model predictions. Each performance indicator has an associated regulatory acceptance criteria. When all the performance indicators are met, the properties will be considered safe, secure, stable and improving and the performance objectives for the site will be satisfied. CNSC staff find the performance objectives and performance indicators for the Beaverlodge site acceptable.

In order to better explain the stable and improving objective, the following example has been provided. As discussed, the indicator for water quality as stable and improving is that the monitoring data trends be within the model predictions.

The model predictions have an upper and lower bounds which were developed using realistic high and low values of the model assumptions. If the measured data is found to be within the predicted range or lower, they will be

considered stable and improving. If the monitoring data trends fall above the predicted range, CNSC staff will require Cameco to complete a reassessment that the site risks.

The example provided is the uranium water concentration predictions for the outflow of the Ace Creek watershed that flows into Beaverlodge Lake. For illustrative purposes, the actual measured data and the trend line has been included to show how the monitoring data trends fall within the predicted range over time. CNSC staff will continue to verify that water quality trends are within the model predictions.

The other item requested by the Commission was the property-by-property timeline estimates for institutional control transfer eligibility. The Institutional Control Program is legislated and managed by the Province of Saskatchewan and it is designed for the long-term monitoring and maintenance of decommissioned mine sites.

The program consists of two primary components, the institutional control registry and the institutional control funds. The registry maintains a formal record of the



transferred properties and manages the funding for any required monitoring and maintenance work. The funds, which are provided in advance upfront by the applicant, pay for the long-term monitoring and maintenance, including any unforeseen events.

In order to transfer property into the Institutional Control Program, Cameco must first submit an application which will be reviewed by CNSC staff and the Province of Saskatchewan.

If the application is accepted by both parties, CNSC staff will recommend that the Commission exempt the properties from CNSC license. After the properties are exempt from CNSC license, the Province of Saskatchewan will accept them into the Institutional Control Program. In 2009 five of the Beaverlodge properties were transferred into the Institutional Control Program following this process.

Cameco has provided a table entitled "Institutional Control Transfer Timeline" which was provided in the annex of the Commission Member Document 14-M60 and describes when each individual property will be eligible for transfer into the institutional control. As there are 65 individual properties, a simplified chart has been

provided that is grouped by area to better illustrate the timeline for when these applications to transfer the sites are expected.

CNSC staff and the Province of Saskatchewan have reviewed the timeline and find that it is acceptable.

CNSC staff would like to close this presentation with the following remarks.

Cameco has made acceptable progress to date and continues to engage local residents on the status of the site. CNSC staff concludes that Cameco's plan for completing the remedial work, verifying its effectiveness and transferring properties into the Institutional Control is acceptable and CNSC staff will verify that the properties are safe, secure, stable and improving prior to recommending that the Commission exempt them from CNSC licensing.

I will now turn the presentation back to Mr. Newland.

**MR. NEWLAND:** Thank you, Rob.

That completes our presentation and we are available for any questions you may have. Thank you.

**THE PRESIDENT:** Thank you.

Turning now to Cameco, do you have any comments to make it this time?

**MR. NAGY:** Thank you. This is Kevin Nagy.

Before I begin, I think I will point out that Dr. Irvine is still with us in Saskatoon. I think he might have been missed when we did the check-in at the start of this item.

Good evening, Commissioners. For the record, my name is Kevin Nagy and I am Cameco's Director of Compliance and Licensing for our Saskatchewan Mining Divisions.

With me today is Liam Mooney and Michael Webster, our Reclamation Coordinator who directly oversees activities and programs related to the decommissioned Beaverlodge properties for CAMECO.

Decommissioning of Beaverlodge was completed in 1985 and the properties were left in a physically stable and safe condition. At that time, it was acknowledged that downstream areas historically impacted by mining operations would recover through natural processes over an extended period of time.

Cameco has been a committed and

capable manager of the decommissioned Beaverlodge properties since 1988. Cameco has conducted environmental monitoring and periodic maintenance to ensure that Beaverlodge remains safe, secure and stable. The decommissioned properties have been well characterized and the residual risks are understood.

We implemented the Beaverlodge management framework in 2009 with the goal of ensuring the long-term safety, security and stability of the decommissioned properties and to prepare for their eventual transfer into the province of Saskatchewan's Institutional Control Program. Guided by the framework and in consultation with our key stakeholders, we developed our path forward plan for the decommissioned Beaver Lodge properties.

The plan included additional remedial actions that are expected to support the natural recovery of the decommissioned properties as well as to ensure their long-term safety and security.

As staff detailed in their report, Cameco has begun the work necessary to implement and monitor these additional remedial actions.

We've also engaged third party experts to evaluate the subsided crown pillar in the Lower Ace Creek area and to develop a suitable remediation plan to ensure its long-term safety and stability.

In the interim, public access is restricted by fencing and signage. Through our public information program, we will continue to update Uranium City residents on the conditions in that area.

Cameco continues to monitor environmental conditions on and downstream of the decommissioned Beaver Lodge properties. Water quality monitoring results continue to confirm the long-term trends expected for water bodies undergoing natural recovery.

Recent results indicate localized improvements in water quality associated with the plugging of flowing boreholes. Monitoring conducted in the area as part of the Eastern Athabasca Regional Monitoring Program supports the conclusions of the Beaver Lodge Country Food Study that traditionally harvested foods are safe to eat.

Cameco's goal for the

decommissioned Beaver Lodge properties is that they be safe, secure and stable. This will facilitate their acceptance into the provincial institutional control program and ensure that the environment as well as the health and safety of the public are protected over the long term.

The indicators we have in place will allow us to assess the effectiveness of our additional remedial actions and to monitor the continued natural recovery on and downstream of the decommissioned Beaver Lodge properties.

We will be available for any questions you may have. Thank you.

**THE PRESIDENT:** Thank you.

So why don't we then jump right into the questions, starting with M. Harvey.

No questions?

Mr. Tolgyesi.

**MEMBER TOLGYESI:** I have some questions about this surface subsidence.

Did I understand you were saying that the geotechnical studies needed to establish the thickness of overburden and the crown pillar?

**MR. DWYER:** Yes, that's correct.

**MEMBER TOLGYESI:** That means that

you don't know what's the thickness of surface pillar right now. And so how you know if it's -- if you don't know that, how do you know there is a drift under?

**MR. DWYER:** Robert Dwyer, for the record.

Old mine working drawings, elevation views, were located by Cameco and were reviewed by the consultants. It did show a thinning of the crown pillar in that area, and approximate thicknesses could be determined through -- from that drawing.

**MEMBER TOLGYESI:** So you don't have now any idea what was a crown pillar, about what's the thickness of a crown pillar?

**MR. DWYER:** I don't have that information available right now. I don't -- you may be able to ask Cameco.

**MEMBER TOLGYESI:** Yes. Cameco?

**MR. NAGY:** It's Kevin Nagy, for the record.

We estimated the crown pillars approximately five metres. That was based on the field work that the consultant did.

**MEMBER TOLGYESI:** It's not very

thick, five metres.

And what was an importance or thickness of -- you know, there were two subsidences, one in 2013 and one in 2014. Am I right, Cameco?

**MR. NAGY:** That is correct.

First I'd like to point out, though, that the risk to the public is low. Access to this small and remote area is restricted by fencing and signage, and the public has been notified. And we continue to update the residents of the conditions in the area.

The original subsidence was observed in, I believe, the fall of 2013 by a consultant we had doing inspections in that area. When Cameco and the JRG, including CNSC staff, visited that area this summer, they observed that -- I'll back up a bit.

Last year, in response to that event, we did place sand and fill in the affected area to mitigate it and to ensure public safety.

When they went back this summer, they found a portion of that fill material had eroded away and had subsided back into the mine workings.



**MEMBER TOLGYESI:** You said you don't know how thick was that, well, how much the subsidence was there because it will give you -- you were saying that there is a near surface crown pillar which doesn't mean it's about -- maybe the crown pillar was about openings, not about the drift. You don't know that right now.

**MR. NAGY:** It's Kevin Nagy, for the record.

All the mine records that we had available have been made available to the consultant doing the work. They were on -- in the field last summer and they were using ground-penetrating radar to gain more information in the field.

They are working on that report now. They are doing a stability assessment of all the crown pillars on the decommissioned properties. And with respect to this area, they will be providing recommendations on remedial actions that we can take to ensure its stability into the long term.

**MEMBER TOLGYESI:** My last will be this one.

No, it's okay.

**THE PRESIDENT:** Okay. Next, Dr. McEwan.

**MEMBER MCEWAN:** Thank you, Mr. President.

So if I understand this correctly, the Gamma survey is to provide a level of radiation that is above background related to gamma rays, and that would then be over-filled to provide shielding, effectively.

Is that correct?

**MR. DWYER:** Robert Dwyer, for the record.

In Table 3.1 in CNSC staff's CMD, we stated that our regulatory acceptance criteria would be a reasonable use scenario demonstrating that gamma levels at the site are acceptable.

Since the CMD has been written, we've -- both the province and CNSC staff have -- and Cameco, I guess, have clarified a little better what our criteria could be.

The province has an objective today. That's one microsievert an hour averaged over a hectare, which is 100 by 100 metres. So we've said anything above that provincial objective would require a reasonable use scenario

which basically includes a member of the public, how they would use the land such as hunting, fishing, trapping, camping, and associated numbers of hours with that activity to develop a dose.

That dose, we said, should be below the public dose limit of one microsievert -- or millisievert in a year.

So the provincial number of one microsievert an hour over a hectare is the threshold. Anything below that is deemed acceptable. Above that, we would like to see a reasonable use scenario to ensure that no member of the public would exceed the public dose limit.

**MEMBER MCEWAN:** So what would the natural background in that area be, and how big an area does this cover?

**MR. DWYER:** The Gamma survey that Cameco is performing involves determining the background in the area. I'm not sure if -- I haven't seen the results of the survey yet. Cameco may be able to elaborate.

**MR. NAGY:** Kevin Nagy, for the record.

We don't have the initial results yet from the Gamma survey. They are out in the

field now.

But while I have the opportunity, I'd like to point out that the decommissioned Beaver Lodge properties pose little radiological risk to the public. The focus of decommissioning work that was completed in 1985 was to address the residual risk of exposure to both the public and workers and, since that time, risk assessments conducted both by third party experts and by Cameco have determined the dose estimates for humans are below the public dose limit.

And in addition, the Beaver Lodge Country Food Study and the monitoring that's done through the Eastern Athabaskan Monitoring Program consistently shows that country foods are safe to eat.

The work we're doing now is basically the final confirmatory Gamma survey of the tailings and waste rock areas before we -- as part of our checklist to move the properties into institutional control.

As Dale pointed out, the initial screening criteria that we are using is in alignment with the provincial and the CNSC guidelines, the 1 microsievert per hour over the 1

hectare area.

If any areas, and we are hoping there is not a lot, obviously, but if any areas are found to be above that screening criteria, in accordance with ALARA, we will look at conducting a risk assessment and basing that on reasonable use scenarios for people either travelling through the properties or stopping and engaging in traditional uses on the properties.

And if there is a risk, we would look to cover this areas with engineered covers.

**THE PRESIDENT:** Maybe that is a good time to bring in Mr. Kristoff from the Ministry of the Environment and hear from him, his assessment of this plan. And also from Dr. Irvine, I want to also hear about -- I missed, people talked about country foods. What about fishing in Beaver Lodge, in the lake? And in those areas where there is no fishing, I assume you are going to put signage on?

So let me start with Mr. Kristoff.

**MR. KRISTOFF:** Dale Kristoff from Saskatchewan Ministry of the Environment.

Yes, as part of the JRG we have reviewed the plan for the gamma survey and the

process for completing that survey. We have a decommissioning guideline that states the 1 millisievert per hour over 1 hectare. Anything over that, it is a risk-based decision making process for the reasonable use in that area.

We have agreed to that as part of the JRG and have reviewed it all along.

**THE PRESIDENT:** Dr. Irvine, about fishing?

**DR. IRVINE:** James Irvine, for the record.

We continue to have a fish advisory as it relates to Beaverlodge and Martin Lake. And as part of the country foods assessment that was done by Cameco, they were able to determine where people procured their country foods, and then did the assessment based on the gathering sites of those foods.

So Beaverlodge and Martin Lake were not included as a site for the country foods assessment.

But otherwise, the country foods study showed that it was healthful for people in the Uranium City area to consume their country foods as they were.

The fish advisory for Beaver Lodge and Martin Lake is due to selenium. So selenium is the driver for our fish advisory. And it is not a do-not-eat advisory, it is a limiting of consumption.

As you may recall, selenium is one of those elements that is important for us to have in our diet. Without selenium we can have significant health problems. But if we get too much selenium we may get troubles with brittle fingernails, hair changes, as well as some gastrointestinal trouble.

So it is safe to be consuming some fish from Beaver Lodge and Martin Lake, but it needs to be limited. So we continue with a fish advisory there. That advisor is somewhat on the conservative side, because we don't take into consideration some more recent information as it relates to bioavailability of selenium in saltwater fish.

And because we don't have that bioavailability information for freshwater fish, we continue with the advisory that we have had in place for almost a decade now.

**THE PRESIDENT:** Thank you.

Mr. McEwan?

Ms Velshi?

**MEMBER VELSHI:** Thank you, Mr. President.

You mentioned that there have been some sites that have already moved over to institutional control. Did those meet these same performance objectives?

**MR. DWYER:** Robert Dwyer, for the record.

Those sites were relatively small, such as the Martin Lake and the Eagle properties. They were deemed to have a relatively low risk.

A gamma survey was completed in those areas and fill material was added to reduce gamma levels, but otherwise they were fairly stagnant and they were deemed to have no unreasonable risk to persons or the environment.

**MEMBER VELSHI:** Thank you.

Now a question for Cameco. But this timeline given in Appendix A, how confident are you that you are going to meet this and what do you see as your key challenge or risk for meeting this?

**MR. NAGY:** Kevin Nagy, for the



record.

I think we are confident that we will be able to meet the timelines outlined in the table. The objectives being that the sites be safe, secure and stable into the long-term.

The work we have done to date in the previous licence term to develop the path forward have determined or have demonstrated that the risks to the public and the environment are low from the properties.

The remedial actions that we are implementing now are designed to enhance the long-term stability and, as well, realize some localized improvements in water quality.

And in fact, as I mentioned in my statement, we are already seeing that in the Dubyna Lake area with the capping of the flowing boreholes in that area.

I think as far as what our greatest challenge would be...

**MR. MOONEY:** Yes, Liam Mooney, for the record.

I think Kevin has hit it. You know, this is the plan that we have over the licence term and we will have to see what the

monitoring results speak to.

But ultimately, it is going to be up to the CNSC and the province, the province accepting it into institutional control, and the CNSC exempting it from the licensing.

So we can put together a schedule, but we are subject to the regulatory oversight and acceptance of the properties into the eventual institutional control framework.

**MEMBER VELSHI:** Thank you.

And my last question for Staff. I was trying to grapple with what we heard in the previous presentation around the above-ground tailings site in Eldorado and Bancroft.

And is there a similar long-term plan for institutional control? I mean there is safe and there is secure and there is stable and low risk. And why would those not be exempt from licensing at some point or am I missing something here?

**MR. LECLAIR:** The institutional control program that we are currently speaking of is established through the Province of Saskatchewan. So any of the existing facilities in Saskatchewan could be subject to the

institutional control program.

At this time, a similar program does not exist in Ontario. I am not sure if Don is still here, who can speak to it a little bit further. But at this point in time, there is not a program in place with the Province of Ontario in order to be able to transfer the mine sites that are in Ontario into an institutional control program.

**DR. JAMMAL:** Ramzi Jammal, for the record.

The institutional control in Ontario, as you saw in Mr. Howard's presentation, is now through a licensing process through a Ministry of Environment of Ontario.

But your question is at what point do we transfer it to an exempt from licensing under the CNSC?

That is currently under the exempt quantity or licence quantity, there are some pockets and elements of these tailings that you saw requires an oversight by the CNSC before it gets transferred to the province.

So as the remediation and decay is taking place, at some point there will be a

release from a licensing of the CNSC. If there is no regulatory body to oversee it, then becomes the decision is who is going to have the ongoing continuous oversight?

But until then, they are still under the CNSC oversight.

**MEMBER VELSHI:** Thank you. That is very helpful.

So Cluff Lake or the property that AREVA is managing, that is in Saskatchewan?

**MR. LECLAIR:** That is correct.

**MEMBER VELSHI:** Right. So it is not exempt from licensing because of the amount? Okay.

**THE PRESIDENT:** First of all, back to Annex A, I really like this table. Really good, I think it is -- at least it is a good overview of what is at stake here.

And I assume that we will be updated annually on performance. Because I think that some targets will be met in 2015, I can see many gamma levels, et cetera. So it will be a good device to monitor progress.

In that vein, what I would like to hear is from the Ministry of the Economy, Mr.

Cunningham and staff, are all the funds in place, all the money in place to execute this plan?

**MR. CUNNINGHAM:** For all the sites that Cameco and ultimately Canada Eldor is the owner to move into the institutional control program, we would have individual fund values assessed at the time they applied.

And then they would have to submit those funds into the program, into our monitoring and maintenance fund and our unforeseen events fund. They would have to submit those before we would accept them into the program.

**THE PRESIDENT:** But everybody now, all the partners agree on this approach in terms of the work that needs to be done. At one time I thought there was a big debate about which methodology one might do to remediate some of those issues.

**MR. DWYER:** Robert Dwyer, for the record.

Yes, that is correct. It has been reviewed by both the CNSC and the province, and we both find the process acceptable for transfer.

**THE PRESIDENT:** So my next question is I notice that one of your indicators,

which I really like those indicators of performance, is the water quality. And I saw the graph on page 10 and in your slides about the model.

What I am trying to understand is it is moving at a concentration -- I can't read what the asymptotic value the end result that we are striving for in terms of uranium in water.

What is the actual target that presumably then will be acceptable almost as -- I don't know if it is drinking water, but at least fishing and all the rest of the stuff in terms of remediation?

**MR. DWYER:** Robert Dwyer, for the record.

So based on the assessment that was completed between 2009 and 2013, it was determined basically that there was nothing practical that could be done to advance the remediation of the site aside from the remedial options that are actively being completed now.

Based on that assessment, the path forward is to just continually monitor and continue to watch the natural recovery of these water bodies.

What we have said is that we wanted to ensure that the model predictions are accurate. And we are going to continue to monitor those to verify that the model predictions are okay. And based on that, we can transfer that to the province to continue to monitor in the long-term and monitor the long-term recovery of the sites.

**THE PRESIDENT:** Okay. I didn't ask the question properly.

So in 2150, what does your model predict as the concentration of uranium in water? And is that a number that the Ministry of Environment of Saskatchewan will accept as okay for institutional control?

**MR. DWYER:** Robert Dwyer, for the record.

I understand your question. Relative to the graph, it looks like it is between around 20 micrograms per litre. However, the acceptance criteria into institutional control revolves more around the stable and improving criteria as opposed to a final end state for that particular lake.

Similar to the Elliot Lake

properties, the tailings management facility is expected to recover naturally in the long-term, which is an extended period of time.

So this is why we have come up with a process that, based on the assessment that was completed, there was some options that were able to benefit, add localized improvements on some lakes. However, the long-term management, the monitoring of most of the lakes is what we will continue to do moving forward.

Just the transfer to institutional control and the acceptance criteria for that transfer is that we validate the predictions and make sure that the decisions that we made, and based on the monitoring data that we have reviewed, is accurate and the province will continue to monitor that into the long-term.

**THE PRESIDENT:** My last question is, you presented some of those activities as options. It seems to me that Cameco is doing all of them, they are not options.

If I understand, the word option means it is either or. So did I get it right?

**MR. DWYER:** Robert Dwyer, for the record.



Yes, you are correct. I think it is a historical reference where there was an option assessment. I always refer to them as the remedial options that were selected I guess. But there are --

**THE PRESIDENT:** But they are all being selected now, all four of them.

**MR. DWYER:** There four items. Yes, that is correct.

**THE PRESIDENT:** Okay, thank you.

Anybody else?

All right, final words to anybody?

Cameco?

**MR. NAGY:** Kevin Nagy, for the record.

I would just like to thank everybody for hanging in there this evening. Thank you.

**THE PRESIDENT:** Thank you, and thank you all. I think this concludes the meeting for today. We will resume tomorrow at 9:00.

Thank you for your patience.

--- Whereupon the hearing adjourned at 8:29 p.m.,  
to resume on Thursday, October 2, 2014  
at 9:00 a.m. / L'audience est ajournée  
à 20 h 29 pour reprendre le jeudi  
2 octobre 2014 à 9 h 00