

**Canadian Nuclear
Safety Commission**

**Commission canadienne de
sûreté nucléaire**

Public hearing

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Le 4 mars 2020

Regency Ballroom
Holiday Inn Peterborough Waterfront
150 George Street North
Peterborough, Ontario

Salle de bal Regency
Holiday Inn Peterborough Waterfront
150, rue George Nord
Peterborough (Ontario)

Commission Members present

Commissaires présents

Ms Rumina Velshi
Dr. Sandor Demeter
Dr. Timothy Berube
Dr. Marcel Lacroix
Dr. Stephen McKinnon

M^{me} Rumina Velshi
D^r Sandor Demeter
M. Timothy Berube
M. Marcel Lacroix
M. Stephen McKinnon

Secretary:

Secrétaire:

Mr. Marc Leblanc

M^e Marc Leblanc

Senior General Counsel:

Avocate-générale principale :

Ms. Lisa Thiele

M^e Lisa Thiele

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Peterborough, Ontario / Peterborough (Ontario)

--- Upon commencing on Wednesday, March 4, 2020
at 1:00 p.m. / L'audience débute le
mercredi 4 mars 2020 à 13 h 00

Opening Remarks

THE PRESIDENT: Good afternoon, everyone, and welcome to the continuation of the public hearings of the Canadian Nuclear Safety Commission on the licence renewal application of BWXT.

Mon nom est Rumina Velshi. Je suis la présidente de la Commission canadienne de sûreté nucléaire.

I would like to begin by recognizing that the land we are gathered on is the traditional territory of the Mississauga Anishnabeg peoples and the territory is covered by the Williams Treaties.

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

First of all, on behalf of the Commission let me tell you we are very happy to be in Peterborough for the next three days.

We enjoy the opportunity to hold hearings

in the community and provide citizens with the chance to participate by intervening or observing the hearings.

Thank you very much to all those who have made our presence here possible and to the staff of the Holiday Inn Waterfront for helping us in terms of accommodating our needs.

I would like to introduce the Members of the Commission that are with us today.

On my extreme right is Dr. Sandor Demeter; to my left are Dr. Stephen McKinnon, Dr. Marcel Lacroix and Dr. Timothy Berube.

Ms Lisa Thiele, Senior General Counsel to the Commission, and Mr. Marc Leblanc, Secretary of the Commission, are also joining us on the podium today.

As we are conducting our Commission proceedings in a facility and an environment that is new for many of us, I would like to take a moment to discuss a few safety considerations.

Please take note that in the event of an emergency there are five emergency doors scattered throughout this hall, so please make a note of the one closest to you.

In the event of a medical emergency, I

would like to know by a show of hands if there are any medical doctors in the room. We have a couple. First responders? Holders of up to date first aid certification? Oh, quite a few of those. We are in good hands. Hopefully we won't need your services.

There is a defibrillator at the front desk also if one is required.

I will now turn the floor to Mr. Leblanc for a few opening remarks.

Marc...?

MR. LEBLANC: Thank you, Madame la Présidente. Bonjour, Mesdames et Messieurs.

The Canadian Nuclear Safety Commission held two days of hearings in Toronto on the application by BWXT Nuclear Energy Canada Inc. for the renewal of the licence for the Toronto and Peterborough facilities.

We are here to listen to the oral presentations by intervenors who registered to present in Peterborough and review the written submissions from residents of or that are related to the Peterborough area.

This is a single hearing conducted in two communities. All the evidence that will be received in Peterborough and was received in Toronto will be part of

the record for consideration by the Commission Members.

The way that they will proceed is that we will begin with presentations from BWXT and CNSC staff. Those presentations were already made in Toronto but will be made again for the benefit of the Peterborough community.

After that, we will very likely take a health break and reconvene after for the presentations by the intervenors, following the order that is listed on the agenda.

Time allowing, after the oral presentations scheduled for this evening, we will proceed with written interventions listed on the agenda for the hearing in Peterborough.

The break for dinner will be at around 5:30 p.m., after which we will resume with an evening session.

To give you a sense of the scope of the next three days, there will be 55 oral presentations, which is a lot, and there will be also the consideration of 123 written submissions.

During today's business, we have simultaneous interpretation. La version française est au

poste 2, and the English version is on channel 1. Headsets are available at the reception.

Should there be more people than this room can accommodate, we have another room in the hotel that can accommodate another 100-plus persons, with a big screen, and if you have to do some work or you have to move around, that may be also a good alternative in this regard.

Please keep the pace of your speech relatively slow so that the interpreters have a chance to keep up.

Transcripts will be available in approximately two weeks. To make the transcripts as meaningful as possible, we would ask everyone to identify themselves before speaking.

I would also like to note that this proceeding is being video webcast live and that the proceeding is also archived on our website for a three-month period after the close of the hearing.

As a courtesy to others in the room, please silence your cell phones and other electronic devices.

As I mentioned, there is a second meeting room.

To support the CNSC's efforts in being an environmentally responsible organization, copies of the submissions are no longer distributed as they are available electronically on our website.

Your key contact persons will be Ms Louise Levert and Ms Julie Bouchard, who are behind the screen for me, at the reception area. Please go and see them if you want to know about when your presentation will take place and what is the order of presentation and timing.

Ms Velshi, back to you.

THE PRESIDENT: I would like to start the hearing with the presentation from BWXT Nuclear Energy Canada Inc., as outlined in CMDs 20-H2.1 and 20-H2.1A.

I will turn to Mr. MacQuarrie for his presentation.

Mr. MacQuarrie...?

CMD 20-H2.1/20-H2.1A

Oral presentation by

BWXT Nuclear Energy Canada Inc.

MR. MacQUARRIE: Thank you.

So I am John MacQuarrie, I am President of

BWXT Nuclear Energy Canada.

With me today representing BWXT are: Natalie Cutler, to my left, who is Director of Communications and Government Relations; and to my right is David Snopek, who is Director of Environmental Health and Safety and Regulatory; behind me, to my left, is Min Lee, who is Director of Quality and Operational Excellence; directly behind me is Ted Richardson, who is Director of Fuel Operations; and behind me, to my right, is Doug Chambers, who is a consultant to BWXT and he is a Vice President of Arcadis.

So I would like to start my presentation by providing a brief overview of our company.

BWX Technologies is a publicly traded company listed on the New York Stock Exchange. The website provides a great deal of information about our company.

There is a summary here on this page that is being presented, about 6,300 employees, just under \$2 billion in revenue annually in U.S. dollars. We have 12 significant manufacturing locations, all in North America. There are about eight in Canada. The facilities in Canada tend to be a bit smaller than the ones in the United States. We have been in the nuclear business for about 60

years and we are entirely a nuclear energy company.

In Canada we have made significant nuclear components for the Candu nuclear industry, including, as noted here, more than 300 steam generators, not just for the Candu plants but also other reactors in the United States and around the world. We have made more than 1.5 million fuel bundles for Candu plants.

We operate facilities, significant nuclear facilities and other facilities for the United States government, primarily at 14 different locations in the United States, and we are the sole supplier of fuel to the United States Navy for their fleet, having provided over 8,000 fuel elements over time.

We operate transparently in three divisions, so when we report our results and talk about our business we talk about three segments of our business that are depicted here on this page. The names that you see here are essentially internal identifiers to these groups.

The first one that we see here on the left is the Nuclear Operations Group, as we call it. Essentially this is a supplier of naval nuclear reactors and fuel for those reactors as well as research reactor fuel for research reactors around the world.

In the centre of this chart is the Nuclear Power Group. This is the group that I am President of. It includes a variety of nuclear entities in Canada. We produce products and services for nuclear power plants as well as medical isotopes.

And then on the right of this chart is our Nuclear Services Group, and this is the group that, as I mentioned on the previous slide, manages and operates facilities for the United States government and is also an advanced technology group for ourselves developing new technologies.

Focusing in on the Nuclear Power Generation Group that we are all a part of here representing BWXT today. So we have three significant entities in Canada. First is BWXT Canada Limited, which is headquartered in Cambridge, Ontario, and has been there for over 175 years. So in that location we are a nuclear component designer, a manufacturer of things like steam generators, as I mentioned before, and we also provide a considerable amount of field services for Candu plants in Canada and around the world.

BWXT Nuclear Energy Canada is described in the centre of this page, headquartered here in Peterborough

but has facilities of course in Toronto and Arnprior, provides fuel and fuel handling systems for Candu plants as well as other engineering services.

We also have BWXT Isotope Technologies Group, or ITG Canada, which is headquartered in Ottawa, in Kanata. Medical isotope production at that facility as well as in Vancouver, as well as contract radiochemical manufacturer.

So on this chart is the summary of the products and services that BWXT designs, manufactures and supplies to the Canadian nuclear industry. So we have a depiction of a simplified view of a Candu plant here and across the bottom you can see some images and names of some of the products we provide, everything from steam generators, waste containers, various reactor components like fuel channel components and fuel handling machines and heat exchangers, and we provide services on all of those, plus some other aspects of the plant.

Now, I would like to talk briefly about our licensed operations.

So first, of course, we have our facility in Toronto which is shown there. The location is shown there on this image. This facility is in the Davenport

neighbourhood of Toronto. There are two buildings on this property. The building in the foreground -- that is a four-storey building -- is where we manufacture the pellets and the smaller building in the background is essentially a warehouse for storage.

In terms of how we make pellets, I just wanted to provide a brief overview of the process.

So we receive the UO₂ powder from our supplier in the drums that are shown there in the picture that is labelled as "Receiving". That is how we receive them. They are transported in a transport truck, a specialized trailer, to that facility in Toronto. Inside that drum is the powder inside a bag. We then take that, mix it with a chemical that is zinc stearate and after it's blended we compact that mixture in a two-stage compaction, eventually pressing it into pellets.

Those pellets then are put into what we call boats, which are pictured in that image, which is a container of pellets that is entering a furnace. In that furnace they are heated at temperature in a hydrogen environment and eventually, after they are done with that environment, they are discharged, they are cooled and then we move them to a grinding operation where we precisely

control the diameter of those pellets.

After that grinding is complete, they go for inspection. So they are all visually inspected and you can see in that picture that is labelled "Inspections" they are sitting on rollers so you can see the entire periphery of the pellet and the ends of the pellet to verify that they are in good condition in accordance with our quality requirements.

Once that is complete, they are packaged on plastic trays that are stacked, wrapped in plastic and banded and put on a metal skid. As you can see, the picture that's labelled "Shipping" there is our special transport truck that is dedicated to transporting the pellets from that facility in Toronto directly here to our facility in Peterborough.

So that's pellet-making.

Now, turning to our facility here in Peterborough.

Of course you can see where we are located, relatively central to the City of Peterborough. We are on a complex that is owned by General Electric and we lease the facilities that we operate in here, which are circled in red in the figure you can see here.

In the figure that is labelled "BWXT Peterborough" you can see there is a red dot on one of the buildings. That is a building where we actually assemble the fuel bundles. And some of the other buildings here are dedicated to our service business that I spoke about as well as warehousing for storage of fuel bundles.

In terms of how we make fuel bundles, a fairly highly automated process. So first we receive the zirconium tubes from our facility in Arnprior, which is a tube mill. So that's the tubes that are depicted here.

We then attach zirconium pads to that, which are depicted in this figure. They are either spacers to space the elements or bearing pads that the bundles sit on when they are in the reactor.

To accomplish the attachment of these appendages, there is a very thin layer of beryllium that is bonded onto these attachments and then they are attached to the tube in a process called brazing, which essentially heats them up and allows them to melt the beryllium to join the appendage to the tube.

After those tubes are complete in that way, we coat the inside of them with a graphite coating, a very thin graphite coating, and then we install the pellets

that we have received from our Toronto facility, which are depicted there in light grey.

And then we weld on end caps onto the tube to seal that tube, seal the uranium inside that tube. It is an evacuated environment and filled with -- and they are checked to ensure that there's no leaks in these elements by a helium leak check process. So each of those are checked once the fuel is assembled.

The fuel elements are assembled into a fuel bundle. You can see a picture there. There is an automated welding assembly facility to attach the end plates to the elements. And then after various operations, including inspection, they are packaged up into a special pallet assembly and they are stored in our facility here.

And then eventually we transport them to either the Pickering or the Darlington Nuclear Generating Stations.

Okay. Now, turning to the topic of our licence renewal.

Our current licence started January 1st, 2011 and expires at the end of this year. It authorizes us to produce fuel with natural and depleted uranium, making the pellets in Toronto and fuel bundles here in

Peterborough. We are allowed to process up to 150 megagrams of uranium at each facility in any calendar month and possess up to 1,500 megagrams in Peterborough and 700 megagrams in Toronto at any one time.

We also have in our licence the ability to receive, repair, modify and return contaminated equipment, and that's specific to Peterborough. So that would be equipment that comes from a nuclear plant that we repair and return to the plant.

So with regard to our renewal application, we submitted our application in November 2018. We are not requesting any changes to possession or processing limits. We are requesting another 10-year licence period and we have also asked for authorization to produce pellets here in Peterborough.

So with regard to the duration of the licence, we view the 10-year licence period as important. It provides -- so I think we have demonstrated that our production processes are stable and predictable, but for us it provides longer-term certainty to our operation.

We do make significant investments from time to time in equipment, as I mentioned, a fairly highly automated operation, and those take a longer term to pay

back. It also stabilizes our operations over a period of time and gives some comfort to our customers who obviously require us to give them some certainty about our ability to produce for them.

In terms of why we are asking for authorization to produce fuel pellets here in Peterborough, we recognize that over the coming licence period there may be changes in our business environment. Particularly one concern is that we understand that the Pickering Generating Station will come to its end of life during this time period and we may be faced with the need to consolidate our operations.

If we had to do that, we would prefer to do so here in Peterborough. And so not an increase in our production capability, it would be a movement of the facility from Toronto here into Peterborough. And, you know, given that situation, it would be important to be able to do so to maintain our viability as a business.

So talking about our operational performance over the licence period.

The safety and control areas that are defined in our licence are reflected in our management system. There are 14 safety and control areas. We have

consistently been rated satisfactory throughout the licence period by CNSC staff on how we have complied with those licence requirements. Over the period of time there have of course been changes in standards and licence requirements and we have successfully adapted to all of those.

So I want to just briefly present our performance in the areas that we have highlighted on this chart, which are radiation safety, environmental safety and industrial safety.

So first, radiation protection of our people, in this chart, in the case for Toronto. So what we are showing here is our performance over time since the beginning of the current licence. This is the total effective dose equivalent over the time period and we are showing two pieces of data, the maximum that any individual received, which is the blue bars, and the green line is the average of that total effective dose equivalent. So what we are showing on the vertical axis here is the unit of measure is millisieverts and, as you can see, fairly stable, both maximum and average.

The red line is what we call an action level, so that is a level related to monitoring how we are

in control of this and we are comparing ourselves to that to show that we are never getting to that action level.

The actual limit in our licence is depicted in that teal-coloured box, which is 50 mSv. It's not on this chart, but we wanted to be able to show the scale of the data a little bit better, so we left it off this chart.

The next chart is the same information, so radiation protection for our people here in Peterborough, and so a similar depiction of millisieverts versus our performance in each year. Again, the blue bars are maximum total effective dose equivalents over time and the green line is the average. And again, the annual limit is 50 mSv here. So the average is on the order of 2 mSv and has been decreasing. You can see the maximums are below 10, so well below the licence limit and consistently below our action level.

Now, changing to radiation protection for the public, so first in Toronto. Now, you can see again this is millisieverts and the top of the chart here is 1 mSv, which is the regulatory dose limit for a member of the public. And what we are showing here in the blue bars are the estimated doses to members of the public in each year

of our operation and you can see that they are quite low, with the 2018 full year was essentially zero. So that's for Toronto.

And then for radiation protection for the public in Peterborough. Again, same units, same scale. In this case, you can see that it's extraordinary low doses that we are estimating that we are giving to members of the public, far below the regulatory limit.

Turning to environmental protection in Toronto.

So first, uranium emissions to air. We do have uranium emissions to air. The units on this chart are in grams and this is a logarithmic scale. So you can see the blue bars here are annual uranium emissions to air in grams. The last few years have been about 6 grams per year, 6 or 7 grams per year. The licence release limit is 760 grams in a year.

Similar data but for uranium to water here, so and now this is in kilograms. Again, a logarithmic scale, and you can see that our releases are less than a kilogram, on the order of 0.9 kilograms in 2018, and our licence limit here was 9,000 kilograms, so well below that.

Now moving to Peterborough for environmental protection and uranium releases to air. This is in grams, and you can see that in 2018 it was 0.002 grams, so very, very small emissions to air. And the licence limit there is 550 grams, so well below that.

And then also in Peterborough but uranium emissions to water, here same units of measure, grams, and again very low emissions here. You can see in 2018, 0.01 grams relative to a licence release limit that is far higher.

And finally in Peterborough, here, beryllium emissions to air. So these are in units of micrograms per cubic metre, and we've got the maximum concentrations measured in our stack as well in the blue bars, and on the green line we've got the average concentrations again measured in our stack in micrograms per cubic metre. And so the last few years, you can see that the maximums are both 0.001 micrograms per cubic metre, and the averages are below that.

And then industrial health and safety. So you can see here the number of lost-time injuries that we've experienced over the licence period both in Toronto and Peterborough. Happy to report that over the last five

years there's been no lost-time injury in our business.

During the licence period we made a number of improvements to our systems and equipment over that period. And so listed on this chart are a number of things that we have done, examples of improvements. So updates to safety analysis, decommissioning plans, risk assessments, emergency plans, particularly made a significant upgrade to our Toronto emergency plan and the plan for Peterborough is going through an update right now. We've fully implemented a systematic approach to training and made improvements to our change management program to ensure that we have rigorous control over change. And so these programs have been updated to make sure that they reflect the current applicable standards and regulatory documents.

So for the remainder of my presentation here, I wanted to specifically address community concerns that we've heard from interventions. On this chart I've got a summary of the various concerns that we've heard about. And so I'm going to talk about each one of these specifically.

First transportation. So wanted to start by first describing how we transport our product. So we are transporting uranium dioxide powder, which comes into

our Toronto facility. And if you look at the figure in the top centre of the page here, you can see the drums that it's transported in. Those drums are -- they're steel drums, about 55 US gallons. They are more or less full of powder, and they have a closure mechanism on the top that makes them fairly robust.

They're transported in a truck by road transport. It's a dedicated trailer that we own. And we contract with a special-purpose transportation company that is trained by us.

Once the powder is converted into pellets, we transport those in another trailer that we own from Toronto to Peterborough, here in Peterborough, in the form of UO₂ pellets. So you can see that depicted in the top right. So again, they're on plastic trays. They are plastic-wrapped and sealed, and then they have the banding around them. And those drums and each of those skids of pellets weight approximately 350 kilograms or something like that.

So everything's done by road. We have tracking features on our trailers so we know where they are.

Public dose from these transports are very

low. The drivers are not nuclear energy workers, not required to be monitored.

We have looked at various scenarios, emergencies, or accidents that could happen, and we have an assistance plan in place with Transport Canada to deal with those. We have not had any significant events, but we have looked at worst-case transport events, which, in our estimate, would be a very severe collision that could perhaps result in a fire or a spill of that material.

And as I said, in 50 years we've never experienced anything like that. We have seen a minor collision, but nothing more than that. In the event that we did have one of these severe events, in our analysis of that, supported by our consultants, it would be contained and cleaned up and would not result in health consequences to the public or the environment.

Decommissioning. There's been a number of concerns expressed about decommissioning and understanding more about that, so we wanted to describe what that looks like.

So we do lease both the facility in Toronto and the one here in Peterborough from General Electric. And we would be decommissioning facilities

whenever we cease operations, as soon as we cease operations.

Decommissioning involves removal of the equipment that we're using and all hazardous materials. There's no plan to remove the buildings. Those structures, we would leave them as they are in place and return the properties to General Electric.

We have plans for this, preliminary plans for this. They're prepared for us by a third party. That third party estimates the cost of doing this work, which is their area of expertise. And we have, as we're required by our licence, fully funded financial instruments that guarantee the funds that are needed to accomplish this decommissioning.

Our objective, of course, is to bring these properties back to an unlicensed state for future use, however our landlord would choose to use these properties. So we would return them essentially to an industrial facility standard.

Insurance. So due to the nature of our operations, we're not required to maintain nuclear liability insurance. However, we are a reasonably large, financially stable, capable organization, as I mentioned.

You can view a great deal about us on BWXT.com, where all of our financial information and a whole lot more is communicated there. As a company, we've operated for over 175 years in Canada successfully, and in the case of our nuclear fuel business, over 50 years of event-free, significant-event-free fuel manufacturing operations.

We do maintain a diversified portfolio of insurance. Third parties would and have told us that we maintain quite a conservative posture from an insurance perspective, and so that is appropriate to the scope of our operations. We do have public liability insurance for off-site damages and injuries. It is a group of companies that insure us, and they are very large companies, and it's a significant amount of insurance that we maintain.

Emergency preparedness. We feel we're well prepared for any emergency. We've done safety analyses for both facilities, Toronto and Peterborough, and analyzed a wide variety of potential events, including severe weather, floods, lightening strikes, things like that, fire, airplane crash, train derailment in the case of Toronto, and of course focused on the hazard sources that we have, so UO₂ powder or pellets, beryllium, hydrogen in the case of Toronto.

All these hazards were analyzed, screened, and we did do or our consultants did do quantitative analysis of these events. And safety analysis concluded in all of these events that the radiological facility risks are low to the public. No scenarios that we have analyzed required evacuation or sheltering of the public due to a radiological risk.

So to expand on this a bit more, we wanted to look at some of the worst-case or maximum-impact scenarios. So on this chart we've got a table that describes what we would view as the two most serious events.

So first event would be catastrophic fire. So this is a very significant fire that affects a significant portion of the facility in the most vulnerable areas. The potential frequency is just -- it's a probabilistic analysis that says what is the potential of that happening. So you can think of that in the catastrophic fire cases, potentially once in 1,400 years.

And then through a calculation, we determine the maximum concentration of uranium dioxide that could accumulate in an off-site location in terms of concentration, so milligrams per cubic metre. You'd see in

this case of catastrophic fire -- and this is specific to Toronto -- 6.1 milligrams per cubic metre. And when you analyze that following international guidelines for the need to either shelter or evacuate, this doesn't meet the criteria for needing to have the public either evacuate or shelter.

And the other one that we analyze would be a structural collapse of the entire facility in Toronto. So you can think of that as a very severe earthquake or something like that. And you see the frequency there. In this case, the lower maximum concentration of UO_2 in an off-site location, and again, so it does not meet the criteria for evacuation or shelter.

Okay, changing to Peterborough and looking at the hazards here. Same two situations, either a catastrophic fire or a structural collapse of all or a significant portion of the facility. Again, very low likelihood of these events.

In the case of the catastrophic fire, which we would consider the worst-case maximum concentration of uranium dioxide off site would be 7.1 milligrams per cubic metre. And again, that doesn't meet the threshold criteria radiologically for shelter or

evacuation.

We also look at beryllium in the case of Peterborough, because we have that here. It's not in Toronto. And we analyzed that, but due to the small quantities that we have it at any given time here on the site, when we looked at that scenario in these worst-case situations, the emissions that we would have are very small, and so they are considered less severe than the scenarios that are presented here.

Hydrogen storage particularly is of concern to some of the intervenors in Toronto and I think is of concern to people here in Peterborough if we were to move operations. So if you look at the photograph there, you can see that we have a 9,000-gallon tank of liquid hydrogen that is shown by the blue arrow on that image. So it's in our -- relatively speaking close to the centre of our yard. It is surrounded mostly by a curb. It is surrounded entirely by a fence. It's got bollards or posts that there are around it for impact protection. And we don't allow vehicles in the yard to park near that.

It's a cryogenic liquid tank, relatively low pressure, 1,500 psi. It's owned and operated not by us but by a supplier, who brings periodically a tanker truck

of liquid hydrogen into the facility and fills that tank periodically.

So we looked at the sort of the credible accident scenarios that could happen. And so it would be viewed as severe but low frequency. And in all cases, we saw no structural damage to the buildings on our property or around or adjacent to our property, no significant release of uranium from any of these significant events. And no injuries of person from a pressure wave from the tank, from fire or explosion. There's potential for broken windows, in the most severe events, that would likely happen to our facility and to the adjacent buildings. And due to the generation of heat, there's a possibility of injury from exposure to that heat on the property but certainly off the property as well, immediately adjacent to the facility.

So uranium emissions both to the air and water were concerns expressed, so first of all, we use natural uranium or depleted uranium. These are naturally occurring elements which is present at low levels in the environment in Canada. It's natural uranium and depleted uranium, weakly radioactive, not known to be carcinogenic. Primarily the concern is chemical toxicity and

concentration in the kidney and kidney damage at high exposure.

In Peterborough, emissions are less than one per cent of the regulatory limit, and Toronto emissions are about one per cent of the regulatory limit. And we have a series of engineered defences and administrative controls in place that give us a defence-in-depth approach to ensure that we are controlling our uranium emissions.

So and this is specific on this chart to how we control emissions in Toronto where our emissions are higher than they are in Peterborough. And so you can see again in this chart how we receive the material. That material then is -- when it's unloaded, it's done so into specially designed process equipment that allow us to mix the zinc stearate with us and start the compaction process and the pressing process. All of that is done inside a room that has negative air pressure, and then the entire building is a contained -- form of containment with negative air pressure and filtration with very high efficiency particle filters.

And around that we have all of the highly trained people that are following our specialized procedures that we've had in place for quite some time.

And they're finding that we are getting what we expect. We do various monitoring of the uranium emissions, so we have monitoring our stack continuously and checking that daily. We have boundary air monitors around our property which we're checking -- they're sampling all the time or checking them weekly. And then we do soil sampling once a year in 49 sites around our property.

Another concern that we've seen expressed is if we're to move pellet production to Peterborough. So we're not planning to do this, and so hoping that this is not what we will have to do. But there are circumstances where we would want to do this, and so that's why we're asking for authorization.

But we want to say that production would be the same as we currently produce. We have a good process for producing pellets. It's well understood, well characterized, very stable. And so we would do so within the existing licence space, so not planning to build any buildings. We have space in the buildings that we already lease from GE.

We did do our environmental risk assessment taking into account if we were operating in Peterborough. So on our website we've got a summary of

that, and you can see that there's no significant risk to the environment for either humans or to the environment. And we expect the emissions would be similar to our Toronto operations, which are about one per cent of the licence limit.

And of course if we do this, we'd do the same environmental monitoring that we currently do in Toronto.

Beryllium emissions. Okay, so this is specific to Peterborough, of course. So as I mentioned earlier, and you can see in this picture, there's a thin layer of beryllium that gets deposited on all of the appendages that are attached to the fuel tube sheath so that they can be brazed or fused onto that sheath. The beryllium in terms of how we use it is vapor-deposited in a small room in our facility onto sheets, small sheets of zirconium. These zirconium sheets are -- we fuse that beryllium onto those sheets, and then they're converted into appendages, so stamped or coined into appendages. These appendages are tacked onto the tube and then they're brazed, so it's an operation where we heat up the local zone on the tube where the appendage is, and it fuses onto the tube and forms a very strong bond.

And we utilize about 20 kilograms of beryllium per year in Peterborough. And we know, of course, the vast majority of that goes onto the product.

So health concerns. Beryllium's known to be carcinogenic. Primary concern is inhalation into the lung. And our highest risk operations are posed during vapour deposition in that specialized room or just small particles in the air from the other operations we undertake.

So in terms of how we control beryllium, very careful controls in place here. Again, it's a defence-in-depth kind of approach. The vaporization occurs in a secure part of our facility that only specially authorized and trained people enter. It's about 500 square feet. The employees there have quite specialized training. They wear respirators and other -- and a suit over their person.

The facility is kept at a negative air pressure. Specialized ventilation that is unique to that operation. The air inside our facility is frequently sampled. Employees wear sample devices.

Ventilation is a two-stage ventilation process. The second stage or the final stage of that is a

high efficiency particulate air filter. These filters are capable of trapping the vast majority of the fine particles, and they're very efficient and proven to be so at removing small particles. And then we continuously monitor the exhaust from this stack that exhausts all of the air from the areas of our facility where we have beryllium operations.

The emissions, as you saw from what I presented earlier, are low, about 15 milligrams to the air per year. And the concentrations in our stack, which is where we measured, so this is after the filter, are about 50 times lower than the Ministry of Environment limit at the fence line. So that's measured in our stack, before any dilution.

On the topic of environmental monitoring, so the CNSC staff conducts monitoring, and they did so in 2014, 2018, 2019, monitoring air, water, and soil. Air results for all years were below the detection limits. No beryllium was detected in the water samples that were taken.

Concentrations in the soil are all below acceptable guideline limits. There was a measurement at the Prince of Wales School which has increased, and the

measurements are provided there for 2018 and 2019, so 1.27 milligrams per cubic metre in 2018, and that increased to 2.34 in 2019.

So we looked at that carefully, because that is a significant increase between 2018 and 2019. And we looked at our systems and looked at -- to make sure they're working properly and make sure we could confirm all of the results in terms of what we measure that we emit. We also are going through a roof repair right now, so we took roof samples off of our roof on the building where we have these operations. And we've confirmed that in our view there's no way that what we're emitting could account for that increase.

So but nevertheless, we understand that there is an increase that's been measured there. And so as far as path forward, our intention is to conduct soil monitoring ourselves using an independent third party. Intend to do that this summer. And the results would be made available to the public and published on our website.

So turning to the topic of our public information program. We had a fair bit of discussion about this program the last couple of days in Toronto.

And so on this first chart, we've got a

description of the types of things that we do in this program. So we are committed to being as timely as we can be, transparent. Engagement with our communities, that's important to us.

We do have a dedicated web site for these operations which has a significant amount of information, and we're increasing that information.

We do have a toll-free number and a dedicated email address which is monitored daily, and we've been working diligently to build relationships with our communities.

We provided more tours in the last year than probably have been provided for many years. We've had various events. We've met with community members, organizations.

We have been providing emailed updates to elected officials, indigenous communities and others who registered and want to be on our mailing list.

We provide newsletters in the community, about 4,000 in each community, three times a year. These are on our web site.

We use -- utilize social media. We have community events like barbecues, information nights.

We sponsor various events and have booths there where people can learn about our business and talk to our people.

And so, you know, we continue to work towards increasing our transparency.

We do have a dedicated effort on improving our indigenous relations. We've been working to build meaningful relationships with indigenous communities, and we recently, in 2017, joined the Canadian Council for Aboriginal Business. And we're currently in Phase 3 of what they call the Progressive Aboriginal Relations Program, which is a structured program that describes how companies can build productive relationships with indigenous communities.

Our employee committee meets every six weeks and they and we as leadership undergo cultural awareness training, and we continue on our journey to become more open to indigenous communities and to understand their concerns about our operations.

We're active in the community in terms of volunteering and providing some investments. Employees are afforded the time to volunteer for local causes. There's a volunteer committee and they select what they spend their

time on.

And the company supports a range of community groups and initiatives, bursaries, scholarships, focus on hospitals and things like that generally by a charitable giving committee that looks at what we might be able to support. And so we're pleased that we're able to support our communities in this way.

We do have a community liaison committee in Toronto. It's existed since 2013.

This is a committee that gives us advice as community members on how we can improve our relationships and communication to the communities. We have not had one in Peterborough, but we are recruiting now for one in Peterborough. We look forward to establishing that.

We hold -- have held and will hold three or four meetings a year in each community of these committees. We found them to be productive and have given some good input and advice on how to engage better with the communities.

In fact, the barbecues that we hold are an example of a suggestion that came to us to try and encourage people to get to know us better.

So these committee members receive orientation about our business, tour our operations, tour both Toronto and Peterborough, and we recruit new members annual. And so there's some turnover of those committees.

We did conduct a public attitude survey. It was undertaken in both Peterborough and Toronto in October-November 2018. It was done by phone call and web to residents targeting near our facilities.

Three hundred and fifty-two (352) surveys were completed, 149 in Toronto and 203 in Peterborough.

And so just a brief summary of the results of those surveys.

So in Toronto, we found that 30 percent of the people that were surveyed were knowledgeable about our business. About 17 percent had heard about us through -- directly through our newsletter, flyer or some event that we had held.

The majority of those that were polled preferred digital information to other forms. And 40 percent of those knowledgeable had rated us as either excellent, good or a good impression overall of our business.

When we look at Peterborough and those

survey results, so about 40 percent were knowledgeable about BWXT. About 25 percent had heard about us through -- directly through newsletter, flyer or other means.

The majority of those polled preferred direct information, so a newsletter or whatnot, so not a digital means of communication. And the 50 percent of those that were knowledgeable of our business had rated us as excellent, very good or good.

So we're going to resurvey -- as I mentioned, in Toronto yesterday, we're intending to -- we said here in 2021, but we're planning to resurvey earlier than that, so we were planning to change that.

So I'd like to just conclude my presentation and -- so started by saying that I believe we've demonstrated throughout our licence period safe performance, what we would categorize as a safe -- a strong safety record and we're pleased to be rated satisfactory across all the safety and control areas by CNSC Staff.

We're compliant with all regulations. We feel we have a robust safety culture, which is behaviours of our people and how they go about doing their jobs, and good human performance programs.

We've worked to diligently continuously

improve our health and safety of our employees and as well as the public and environment.

Radiation exposures, as I presented, have remained low, well below limits -- licence limits and the emissions and public doses have remained fractions of the regulatory limits.

And of course, as I said, we've had really good safety of our people, and especially over the last five years where we've had no lost time events or no other significant events.

Finally, I'd just like to summarize our view of the benefits of our business as a nuclear fuel manufacturer and nuclear energy generally in the Province of Ontario.

We feel that we contribute to the clean air that we all enjoy as Ontarians. Nuclear energy, nuclear power is emissions-free power, or generally emissions-free power, helps avoid 45 million tonnes of CO₂ annually, which is the equivalent to removing 10 million cars off the roads.

It is low cost. It is very reliable, and it is affordable electricity. And in the case of nuclear power, it's the second-most affordable according to the ISO

for the Province of Ontario.

We do have highly-skilled, very talented people working for us, and these are good jobs that we believe help boost the economy. Between Peterborough and our plant in Toronto, we have about 400 people engaged in our business, in BWXT Nuclear Energy Canada.

And these are high-tech jobs in manufacturing, engineering and other support positions.

And we are involved, as I mentioned early in my presentation, with nuclear medicine. It's a significant part of our business.

We are a leading supplier of medical isotopes in the Canadian market and supply outside of Canada significantly, and we are working on supplying the most significant diagnostic -- nuclear diagnostic product, which is technecium-99. We are working on building a supply of that in North America, which there hasn't been for some time, since the NRU reactor in Chalk River was shut down.

And so that concludes my presentation about our company. Thank you for the opportunity to present.

THE PRESIDENT: Thank you, Mr. MacQuarrie.

We'll now turn to a presentation from CNSC staff as outlined in CMDs 20-H2, 20-H2.A and 2.B.

Ms Tadros, over to you, please.

CMD 20-H2/20-H2.A/20-H2.B

Oral presentation by CNSC staff

MS TADROS: Thank you, and good afternoon, President Velshi and Members of the Commission.

My name is Haidy Tadros. I am the Director General of the Directorate of Nuclear Cycle and Facilities Regulation.

With me today for our presentation, to my right are my colleagues, Dr. -- to my left are my colleagues, Dr. Caroline Ducros, Director of the Nuclear Processing Facilities Division, and to her left, Mr. Julian Amalraj, Senior Project Officer from within the same division.

We are here to present CNSC Staff's assessment of BWXT's application to renew its fuel fabrication operating licence for the Toronto and Peterborough facilities.

Also with us here in the room and in our

Ottawa office are CNSC specialists who have been involved in the technical assessment, the environmental protection review, the compliance oversight of BWXT. They are available to answer the Commission's questions will have.

Our presentation, identified as CMD 20-H2.A, summarizes CNSC Staff's written submissions found in CMD 20-H2 and supplemental CMD 20-H2.B. Staff's supplemental CMD provides our assessment and responses to the themes found in the interventions received.

From the start, CNSC staff would like to acknowledge the unprecedented number of interventions received on this file. We would like to thank all the intervenors for expressing their thoughts, ideas and concerns on this file.

We recognize the importance of respecting and not discounting people's thoughts of risk and fear levels. We all have different perspectives and perceptions of risk.

It is clear by the questions and concerns received we need to bring more awareness and understanding to what we do as Staff, how we do it, as well as better explain radiation and its health impacts using science and data.

On this slide, we would like to point out a couple of corrections to the published CMD 20-H2.

In Section 3.5.5 on page 28, there is an error in the licence condition numbers. They should read 5.1 and 5.2, not 15.1 and 15.2. Also, in the licence change table on page 97, the wording of licence condition 15.1 should be the same as that provided in the draft proposed licence.

This slide provides an outline of our presentation today.

We will start by providing what has been requested by BWXT in their licence application, followed by a brief overview of BWXT's operation and CNSC Staff's regulatory oversight activities.

We will then provide a summary of CNSC Staff's technical assessment of BWXT's application.

In the next section of the presentation where we highlight CNSC Staff's public engagement and funding provided under the CNSC's participant funding program, we will outline the main themes from all the interventions we received.

The presentation will end with CNSC Staff's overall conclusions and recommendations to the

Commission on BWXT's licence renewal request.

As has been outlined, in November 2018, BWXT submitted a licence renewal application for operating its fuel fabrication facilities.

In its application, BWXT requested that the Commission renew its current operating licence to allow continued licensed activities for a period of 10 years.

BWXT also requested that the Commission allow the production of fuel pellets at the Peterborough facility. This activity is currently licensed at the Toronto facility under the same licence.

BWXT indicated that there will not be an increase in the production of fuel bundles at Peterborough if the request to conduct pelleting is authorized by the Commission.

BWXT also requested acceptance by the Commission of a revised financial guarantee through two new instruments, a surety bond and a letter of credit.

I will now pass the presentation to Dr. Caroline Ducros.

DR. DUCROS: For the record, I'm Dr. Caroline Ducros, Director of the Nuclear Processing Facilities Division. I will continue the presentation with

the facility overview and an overview of CNSC's regulatory oversight.

BWXT is a fuel fabrication facility that operates out of Toronto and Peterborough.

The two facilities together manufacture CANDU fuel bundles. The fuel bundles are used in Canada's CANDU power reactors, specifically Pickering and Darlington nuclear power plants.

BWXT processes ceramic grade natural and depleted uranium dioxide.

The processing of uranium at BWXT is an industrial operation. In other words, the uranium is processed just like any other industrial substance and the facility operations do not include any nuclear reactions.

Also, there is no enriched uranium processing carried out, eliminating any possible criticality events.

As an industrial operation, the primary hazards are conventional hazards related to processing; namely, fire, occupational injury and potential exposure to hazardous chemicals, and radiological hazards from exposure to natural uranium. All hazards from operations have mitigation measures in place to protect workers, the public

and the environment.

The Toronto facility consists of two buildings within a fenced site with access control.

The building marked "1" on the picture is the main processing plant and the building marked "2" on the picture is a warehouse that stores, segregates, packages and ships contaminated waste from BWXT's operations for disposal.

The Toronto facility processes natural and depleted uranium into pellets and is licensed to possess up to 700 Mega grams of uranium and to process up to 150 Mega grams of uranium per month.

The facility is located in an industrial zone surrounded by residential and commercial buildings including several high-rise buildings.

The site is owned by GE Canada and is leased by BWXT, and the lease requires the licensee to maintain the current industrial zone designation.

The white tank in the middle identified as number 3 in the picture is a hydrogen tank that is located at a distance from all surrounding buildings. The hydrogen in this tank is used as part of BWXT's pelleting process.

The facility has operated safely at this

location with no impact to public and the environment since 1965.

The Peterborough facility manufactures fuel bundles using pellets from Toronto and zircalloy tubes manufactured in house.

The building marked "1" on the picture is the main processing building. The building marked "2" is the main storage area. And the building marked "3" on the picture, with the long green glass top, provides conventional reactor services, which include handling contaminated equipment received from off-site nuclear facilities.

The Peterborough facility is licensed and capable of storing and handling up to 1,500 Mega grams of uranium. Most of the uranium on site is stored uranium powder for the purpose of ensuring continuity of operations and finished fuel bundles to ensure supply security for the nuclear power plants.

The actual quantity of uranium processed on a daily basis into fuel bundles is well below the operational limits the site is licensed to handle.

The facility is located in a designated industrial zone with residential buildings and a school on

one side and the GE industrial complex on all other sides. BWXT leases the facilities from GE Canada, and the lease requires the licensee to maintain the current industrial zone designation.

The facility has operated safely with no impacts to the public or the environment since 1965.

In late December 2010, after a two-part renewal hearing, the Commission issued a single combined licence for both the Toronto and Peterborough facilities. The single licence was issued to provide greater consistency of regulatory oversight and to improve administrative efficiency.

And in December 2016, Commission transferred this single licence to BWXT.

The reasons for which the Commission issued a single combined licence continue to be valid today.

Both facilities operate under a single management system with clear responsibilities for the licensed activities at both sites. The CNSC's Licence and Licence Conditions Handbook framework requires the licensee to provide CNSC Staff with prior notification of facility modifications in an efficient, documented and transparent

manner and provides common compliance verification.

Annual performance has been reported to the Commission in public meetings since 2012. These Commission proceedings provide information dissemination on operations, identify any changes at the facilities, and allow for public participation.

Because of this, Staff recommend that the Commission maintain a single licence for these two facilities.

The CNSC has a robust regulatory framework in place and regulatory oversight is provided by CNSC Staff to verify that licensees operate in a safe manner and in compliance with the requirements of the *Nuclear Safety Control Act* and associated regulations, the licence and Licence Conditions Handbook.

Regulatory documents include several CSA standards. These standards outline requirements for licensees' operations.

The International Atomic Energy Agency (IAEA) has safety standards that are incorporated in CNSC regulatory documents and CSA standards provide clarity on expectations with regard to the design and operation of fuel fabrication facilities like BWXT.

BWXT's performance is reported annually to the Commission through the regulatory oversight report for uranium processing and nuclear substance processing facilities.

BWXT's performance for the last reported year, 2019, was rated as satisfactory.

CNSC compliance verification includes desktop reviews, inspections, event reviews and the assessment of annual performance reports. The CNSC has a dedicated Facility Assessment and Compliance Team for the oversight of all licensed activities at these facilities.

CNSC Staff direct effort for compliance verification for the BWXT licence, has been approximately 350 person days, or the equivalent of 1.5 full-time employees, per year.

This slide provides the breakdown of the compliance oversight activities carried out by CNSC Staff outside of desktop reviews that were conducted at BWXT during the past licence period. These included 30 on-site inspections.

CNSC inspections assessed all aspects of the facility operations in all 14 Safety and Control Areas. The inspections included planned inspections as part of

regular compliance and reactive inspections to address any specific events or issues.

The International Atomic Energy Agency (IAEA) conducted 38 safeguards inspections at the two licensed facilities. The increased number of safeguards inspections in 2017, 2018 and 2019 was due to the revised state-level safeguards approach for bulk handling facilities.

BWXT reported a total of 21 events over this licence period. CNSC Staff assessed the corrective actions taken by BWXT from the lessons learned from these events and found that to be satisfactory.

CNSC Staff also issued three information requests to BWXT under paragraph 12(2) of the General Nuclear Safety and Control Regulations.

The 12(2) information requests covered lessons learned from Fukushima in 2011, a review of reporting requirements in 2016, and improvements to beryllium handling as a response to the beryllium event reported by BWXT in 2017.

I will now pass the presentation to Mr. Julian Amalraj, senior project officer at the CNSC.

MR. AMALRAJ: Good afternoon, President

Velshi and Members of the Commission.

My name is Julian Amalraj. I am a Senior project officer and a Designated Inspector in the Nuclear Processing Facilities Division of the CNSC.

I am responsible for the licensing and compliance oversight of BWXT Nuclear Energy Canada and have been the single point of contact for this facility since 2014. I, along with the technical specialists assigned to this facility, form the Facility Assessment and Compliance Team that conducted the various technical assessments of BWXT's licence renewal application.

On this slide is an outline of the licensing process that has been followed by CNSC Staff for BWXT's licence renewal. The process begins with the licensee's submission of an application.

CNSC staff review each licence application in the context of the *Nuclear Safety and Control Act* and the regulations that apply to the activities requested in the application. The review includes a sufficiency check wherein CNSC staff ensure that the application contains all the information needed to meet the regulatory requirements of the *Act* and the associated regulations.

CNSC staff also undertake a determination

as to whether the proposed activities require an environmental assessment under the applicable federal acts at the time of the application.

A full technical assessment of an application is only carried out by CNSC staff once it is satisfied that all information requirements are met and that the information is sufficient and of good quality.

Following the technical assessment CNSC staff provide a Commission Member Document with the results of its review of all aspects of the regulatory framework and recommendations to the Commission. The Commission Member Document includes a draft proposed licence and any facility-specific conditions for the Commission's consideration.

CNSC staff's assessment is risk informed and based on credible scientific evidence. It also includes other matters of regulatory interest, including Indigenous consultation and engagement, public consultation, financial guarantees and cost recovery.

CNSC staff conducted an environmental protection review under the *Nuclear Safety and Control Act* and the associated regulations for this application. This report can be found in staff's CMD 20-H2, Appendix D.

The environmental protection review report included an assessment of the application, environmental effluent and emissions, a site-specific environmental risk assessment that details the human health assessment and the ecological impact of the current operations, as well as considers the consolidated impacts of the proposed pelleting operations and the fuel bundling manufacturing at Peterborough.

The assessment of human health inherently includes the most vulnerable critical receptors, like children. The report also takes into consideration BWXT's compliance performance over the past licence period and results from CNSC's independent environmental monitoring program and other regional monitoring data in proximity to Toronto and the Peterborough facility.

The environmental protection review concluded that BWXT has and will continue to make adequate provisions for the protection of the environment and the health of persons.

CNSC staff use a well-established safety and control area framework to evaluate BWXT's licence application. CNSC staff's written submission, CMD 20-H2, Appendix C, contains a description of the safety and

control areas and the specific areas assessed. Appendix B.1 of the CMD provides the regulatory basis of what the requirements are for a Class 1 fuel fabrication facility and Appendix B.2 of the CMD provides the technical basis of what standards and regulatory documents were used as references for the assessment itself.

CNSC staff assessed BWXT's implementation of all its programs and procedures against requirements and verified their effectiveness through compliance performance over the current licence period.

CNSC staff concluded that BWXT's programs in all safety and control areas meet regulatory requirements.

CNSC staff will now provide a summary of selected safety and control areas that support the overall conclusions and recommendations.

CNSC staff's assessment confirmed that BWXT has a robust management system that is compliant with the requirements of CSA N286-12 Management Systems for Nuclear Facilities.

CNSC staff verified that BWXT's management periodically reviews the facility's safety and performance. In addition, CNSC staff verified that internal audits were

conducted on the performance of BWXT's management system and concluded that BWXT's management system and audits meet CNSC requirements.

CNSC staff confirmed that BWXT maintains a robust change management and records management process that includes all aspects of changes to the facilities and equipment.

CNSC staff concluded that BWXT also met requirements under REGDOC 2.1.2 Safety Culture, and observed good practices while conducting inspections.

Overall BWXT's management system meets requirements and governs all aspects of licensed activities.

BWXT's licence renewal application was supported by updated safety analysis reports for the Toronto and Peterborough facilities. These reports identified hazards along with engineered barriers, administrative controls and emergency procedures to detect, intercept and mitigate any abnormal occurrences. In addition, BWXT analysed the progression of postulated events, consequences and documented mitigation measures in place.

BWXT has also conducted several related

assessments and studies for externally initiating events, including earthquake risk analysis, assessment for aircraft impacts, flooding risk analysis and potential events due to proximity of the railway line near its Toronto facility.

Accident conditions that have potentially severe consequences have been analysed using probabilistic approaches to demonstrate safety in very unlikely scenarios and that mitigation measures are in place for adequate protection of the environment and health and safety of persons due to the operation of these facilities.

CNSC staff concluded that BWXT has adequately assessed the hazards associated with licensed activities and has demonstrated safety throughout.

The facility's safety analysis reports meet requirements and CNSC staff rated BWXT's safety analysis program performance as satisfactory.

CNSC staff confirm that BWXT's facility physical design complies with all applicable codes and standards as listed in CNSC staff's submission CMD. These codes and standards ensure that building structures, heating, ventilation and equipment, including pressure bearing components, are appropriately constructed, conditioned and operated.

The BWXT fuel fabrication facility design is in line with International Atomic Energy Agency documents Safety Standards Requirement 4, *Safety of Fuel Cycle Facilities*, and International Atomic Energy Agency document SSG-6, *Safety of Uranium Fuel Fabrication Facilities*. These standards and guides ensure consistency of operation with the latest operating experience gained internationally.

BWXT is requirement by its licence to notify the CNSC of significant changes to its fire protection program and to submit accompanying third party reviews for compliance with the applicable codes and standards. CNSC staff confirm that all operational changes are assessed, managed and documented by BWXT through the change control program and procedures under its management system. All changes must remain within the licensing basis.

CNSC staff concluded that BWXT's physical design program meets requirements under the *Nuclear Safety and Control Act* and associated regulations.

If the Commission authorizes pelleting operations at the Peterborough facility and when BWXT is ready to proceed with pelleting at the Peterborough

facility, BWXT will be required to make facility modifications.

Pelleting operations involve several sub-operations like grinding, sintering and pellet pressing. The design and safety performance of these operations are well understood and documented.

CNSC staff assessed and concluded that the proposed activity can be conducted safely within the existing operating limits of the Peterborough facility.

CNSC staff recommend a facility-specific licence condition 15.2 requiring BWXT to submit a commissioning report prior to conduct of pelleting at the Peterborough facility. Upon reviewing the commissioning report CNSC staff would confirm that the safety measures associated with each sub-operation are present and that the pelleting activity remains within the licensing basis as approved by the Commission.

CNSC staff have requested delegation of authority for the facility-specific licence condition and will report on BWXT's facility modifications and associated verifications to the Commission in the annual Regulatory Oversight Report in a public meeting.

CNSC staff confirm that BWXT has

implemented and continues to maintain a radiation protection program that ensures contamination levels inside the licensed facilities and radiation doses received by individuals are monitored, controlled and maintained as low as reasonably achievable.

CNSC staff verified that BWXT's radiation protection program is implemented effectively. Action levels are set appropriately with multiple levels of control, with quarterly and annual action levels based on the type of exposure.

CNSC staff confirm that BWXT has an ALARA committee which establishes annual radiation program goals and initiatives for reducing worker doses.

CNSC staff conclude that the radiation protection program meets CNSC regulatory requirements and is protective of the workers at both facilities.

This graph shows the average and maximum doses of individuals at the Toronto and Peterborough facilities, along with the annual action levels at each facility against the red line, which is the regulated dose limit for a nuclear energy worker.

The annual maximum individual doses over the current licence period were between 7.8 and 11.8

millisieverts, which is less than a quarter of the annual dose limits set in the *Radiation Protection Regulations*. In general, the dose is proportional to the amount of nuclear material processed at any given time, with some variations that account for work activities.

Exposure to workers can result from beta or gamma radiation sources outside the body or alpha, beta and gamma radiation taken into the body as a result of inhalation, ingestion or absorption of uranium through the skin.

The primary radiological hazard in BWXT's operations is radiation dose due to external gamma radiation and dose to the lungs from inhalation of uranium dioxide, which is an insoluble form of uranium.

BWXT's dosimetry program includes assessment and monitoring techniques that account for both external and internal exposures and corresponding dose assignment. The charts provide the total effective dose assigned to workers, which is the sum of the external whole body dose, as measured by a dosimeter, and the internal dose determined by calculations for exposure.

This slide shows the estimated potential radiation doses received by the public from BWXT's

facilities. Both the Toronto and Peterborough facilities have very little annual releases of any radioactive material into the environment. Both facilities monitor for the presence of gamma radiation above natural background by environmental dosimeters placed at the plant boundaries.

The Toronto facility also has receiving environmental air samplers to measure releases from the facility. Since the inception of this monitoring program, all the measured doses at the Peterborough facility boundary have been below detectable limits and the Toronto facility measured doses have been very low.

To put the radiation dose to public from BWXT's operations into a broader context, CNSC staff would like to draw attention to a comparative schematic of various activities a member of the public might undertake and the associated radiation doses they might expect from these activities.

The public dose limits prescribed in the *Radiation Protection Regulation* is one millisievert and the average dose from natural background radiation in Canada is 1.8 millisieverts. Comparatively, a member of the public living near a nuclear facility like BWXT for a full year is predicted to get a radiation dose that is less than the

dose received from a dental x-ray or a cross-Canada flight journey.

BWXT's dose to public from operations are typically one-hundredth of the public dose limits and well below natural background. On this basis CNSC staff concluded that there is no impact nor health risks to public and public safety from BWXT's continued operations.

CNSC staff confirm that BWXT's conventional health and safety program is effectively implemented and complies with the Canada Labour Code and the associated *Canada Occupational Health and Safety Regulations* for hazardous chemical exposure.

CNSC staff confirm that BWXT monitors air concentrations inside its facility to assess occupational exposure to hazard chemicals and uranium. In addition, workers performing operations with beryllium wear personal protective equipment and personal air samplers for protection and to assess occupational exposure.

BWXT reported one significant event to the Commission during the current licence period, which involved an occupational exposure limit exceedance of two workers to beryllium. The event was presented to the Commission in CMD 17-M53. CNSC staff verified that BWXT

addressed this event satisfactorily and the event was closed.

CNSC staff as part of this licence renewal evaluated and concluded that BWXT's program and performance for conventional health and safety meets requirements.

BWXT has developed, implemented and maintained an effective environmental protection program at the Peterborough and Toronto facilities that protects the environment and the public in accordance with CNSC regulatory requirements.

During the current licence period releases to the environment were well below the release limits specified in the CNSC licence. At Toronto uranium releases along with ambient air and soil monitoring show that there is no health risk to the public from licensed activities. At Peterborough uranium and beryllium releases show that there is no health risk to the public from licensed activities.

Uranium air emissions and liquid effluents from the Toronto and Peterborough facilities are provided on this slide. Uranium air emission levels at the Peterborough facility are expected to increase to a level similar to those of the Toronto facility if pelleting

operations are implemented.

The monitoring demonstrate that uranium air emissions are effectively controlled and emissions from BWXT's operations have remained consistently low during the current licence period.

CNSC staff confirm that effluent releases from BWXT's operations remain well below licence limits. It should be noted that the water effluent releases have additional restrictions based on best available treatment of liquid effluents. At BWXT's facilities wastewater is collected, treated or filtered and tested for uranium prior to its release into municipal sanitary sewers. Because of this, irrespective of the licence release limits, all liquid effluent releases are kept as low as technologically possible, and the facilities are designed to hold significant water to ensure no uncontrolled releases happen.

Of note, throughout the current licence period beryllium concentrations in air emissions and liquid effluents from the Peterborough facility have been negligible.

CNSC staff have reviewed the monitoring results for all releases from the licensed facilities and

found the levels to be consistently low, acceptable and conclude that the releases have no health risk to the public and the environment.

As part of this licence renewal CNSC staff required BWXT to propose new licence limits. The new limits, called exposure based release limits, or EBRLs, take into consideration chemical toxicity and protection of aquatic life along with radiotoxicity. EBRLs impose the most stringent criteria for all releases. This slide provides the new EBRLs calculated for the two licensed facilities. The EBRLs are concentration based and are set at the point of release.

There are no changes to the action levels for releases from the current licence period, and BWXT continues to implement a store, treat, test and release process for the uranium liquid effluents.

BWXT has sufficient capacity to store wastewater during upset conditions as earlier stated. BWXT only discharges batches when the samples are below 3 milligrams per litre, significantly less than the EBRLs for uranium liquid effluents.

This slide provides additional information on how the exposure based release limits were set. BWXT

harmonized the air release limits with the provincial air quality standards under Ontario Regulation 419-05, Air Pollution for Local Air Quality, and calculated exposure base release limits that apply at the stack based on meeting the applicable air quality standards at the point of impingement.

As earlier stated, for air emissions BWXT calculated release limits for each stack that are based on concentration per unit cubic meter of air emitted from the facility. For releases to water BWXT calculated exposure based release limits by deriving the release limit based on the Canadian Council of Minister of the Environment Protection of Aquatic Life Guidelines.

The liquid effluent exposure based release limits also take into consideration the annual flows into the Toronto and Peterborough municipal wastewater treatment plants, as well as the annual average of treated water discharged from the Toronto wastewater treatment plant where discharges are routine and frequent and the Peterborough facility where discharges are infrequent.

The new limits in effect reduce the current limits by approximately one-fifth for liquid effluents and by one-half of the current air emissions

release limit.

The Toronto facility measures uranium in ambient air at five locations around the facility to confirm the effectiveness of emissions abatement systems and to monitor the impact of the facility on the environment. The results from these monitoring locations show that uranium in air as suspended particulates has consistently remained very low throughout the current licence period.

The highest annual average concentration among all sampling stations of uranium in ambient air during the current licence period was 0.001 micrograms per meter cubed. This is well below the Ministry of Environment Conservation and Parks standard for uranium in ambient air of 0.03 micrograms per meter cubed.

BWXT also conducts soil sampling on an annual basis at 49 locations on BWXT's Toronto site on commercial property located along the south border and in nearby residential neighbourhoods.

The average uranium in soil concentrations over the current licence period was well below the applicable Canadian Council of Ministers of the Environment Soil Quality Guidelines for the protection of the

environment and human health for industrial, commercial and residential part-time use.

This data demonstrate that the Toronto facility's operation does not contribute to the accumulation of uranium in surrounding soil and that no adverse impacts to relevant human and environmental receptors are expected.

The most frequent emissions discharged from the Peterborough facility already meet the Ministry's annual standard of 0.03 micrograms per meter cubed at the point of release, eliminating the need for additional ambient air and soil monitoring.

CNSC staff require BWXT to implement ambient air and soil monitoring at the Peterborough facility similar to the Toronto facility if the Commission grants authorization for the addition of pelleting operations at the Peterborough facility.

A facility-specific licence condition 15.1 has been included in the proposed licence for this purpose. The proposed conditions will ensure monitoring continues to meet CNSC regulatory requirements.

A number of intervenors have raised concerns regarding an apparent trend of beryllium in soil

from the CNSC's independent environmental monitoring program around the Peterborough facility.

The CNSC conducted its environment -- Independent Environmental Monitoring Program of IEMP sampling campaigns in 2014, '18 and '19 in Peterborough. Sampling included air, soil and water samples that were analysed for uranium and beryllium content.

The IEMP is a program that samples the ambient environment to confirm the effectiveness of existing data monitoring programs and provide a snapshot of air, soil and water quality around nuclear facilities.

CNSC staff review the data collected with established screening levels and take action where appropriate.

This slide provides a graph of the data for beryllium in soil collected around Peterborough. The actual values, the analytical uncertainties associated with each campaign and the range of measured values are provided in the table on the right-hand side.

The CNSC's sampling analysis techniques have improved continuously over the years. Sampling collection techniques were improved after 2014. Furthermore, at the CNSC laboratory analysis methodologies

were improved from a 40 percent uncertainty in 2014 to a 10 percent uncertainty in 2019. We also note that there is a natural variation in soil as well, potential deposition from BWXT's beryllium air emissions. All of these factors have likely contributed to the values observed.

BWXT has in stack continuous monitoring for beryllium air emissions that show very little to no releases. Reported concentrations range from 0.000 micrograms per meter cubed to 0.009 micrograms per meter cubed of beryllium from this facility.

CNSC staff's review of all available data including stack sampling data and the IEMP air sampling data demonstrate that there is no correlation between the air concentrations measured and the perceived increase in soil concentrations.

BWXT's facilities are also under negative pressure at all time to ensure there are no fugitive emissions.

Finally, as evident from the graph, all values observed are within background values and generally in the same range as that observed 18 kilometers from the facility. These levels are protective of the environment and human health.

The IEMP data from the previous slide is graphically presented here to show the impact of beryllium in soil concentration values from a perspective of human health. As earlier mentioned all soil sample results are within background levels and below the CCME environmental health guidelines of 4 milligrams per kilogram that is also used as a conservative screening level by CNSC staff to take any appropriate action with respect to IEMP results.

However, it is important to note that as per the CCME guidelines, the guideline for protection of human health is actually 75 milligrams per kilogram. The observed values are at least an order of magnitude lower than this.

CNSC staff, based on this data, concluded that the health of person at the locations sampled continue to remain protected and there is no impact to human health or the environment due to beryllium concentrations observed in soil around BWXT's licensed facilities.

CNSC staff recognize and acknowledge the community concern around this issue, especially the single higher value of 2.34 milligrams per kilogram observed at the Prince of Wales School. CNSC staff propose to take action in

response to not only the need for additional environmental monitoring data to address this, but also public inquiries and concerns regarding beryllium in soil. To this effect, CNSC staff will conduct additional IEMP soil sampling in 2020. Additional details will be finalized once CNSC staff take public feedback on this issue.

CNSC staff will work with BWXT on its commitment to conduct dedicated environmental testing for uranium and beryllium to confirm levels remain within the background and are protective of the public and the environment.

As stated in the Peterborough Public Health Intervention, CMD 20-H139, CNSC staff support BWXT establishing a community liaison committee in Peterborough to improve public information and provide more participation of the public towards information dissemination.

CNSC staff have been active observers and participate in this mechanism at Toronto and will work with the community liaison committee in Peterborough to improve and address public information needs of the local community.

Continuing with CNSC staff's summary of

the safety and controlled areas assessed, CNSC staff assessed and concluded that BWXT's emergency preparedness program is in compliance with the CNSC Regulatory Document REGDOC 210.1 Emergency Response.

BWXT tests emergency preparedness periodically as per requirement and has arrangements in place with local fire, emergency management services and the local police for emergency response. Off-site response organizations receive training and facility familiarization tours to ensure all response staff are familiar with the operation and hazards at the BWXT's facilities.

CNSC staff verified through inspections that BWXT has in place various fire protection systems that include detection, suppression systems and administrative controls to minimize the likelihood of a fire and its consequences, which is the most significant hazard present due to the licensed activities.

CNSC staff assessed and concluded that BWXT's fire protection program meets requirements.

CNSC staff conducted two focussed inspections on Emergency Preparedness in 2016 and 2018 on emergency response and verified that BWXT's emergency plan addressed all credible accidents and meets requirements for

the type and risk of the facility licenced.

In March 2019 BWXT submitted an updated preliminary decommissioning plan for both the Peterborough and Toronto facilities as part of licence renewal. CNSC staff have assessed the updated submissions and find that it meets the applicable regulatory requirements and provides an acceptable decommissioning cost estimate.

BWXT's preliminary decommissioning plan captures strategies, activities and cost estimates for decommissioning Toronto and Peterborough facilities. The targeted end state for the two facilities is unrestricted industrial release.

The CNSC requires that BWXT submit a detailed decommissioning plan and obtain authorizations from the Commission before any actual decommissioning of the two facilities.

As part of this licence application BWXT has proposed a financial guarantee of approximately \$48.1 million for the decommissioning of both licensed facilities combined.

CNSC staff have assessed the cost estimate against the requirements of CNSC *Regulatory Guide G-206, Financial Guarantees for the Decommissioning of Licensed*

Activities, and considered the proposed amount to be adequate and credible.

BXWT is proposing the use of a combination of a letter of credit and a surety bond to fund its financial guarantee. The letter of credit in the amount of \$2 million, payable immediately upon demand, covers the cost -- covers the initial cost of decommissioning activities as well as the disposal costs of waste stored on site. And the remainder of decommissioning is covered by the surety bond for approximately \$46.1 million.

CNSC staff find BWXT's estimates to be credible and recommend to the Commission that the proposed amounts and the proposed instruments be accepted.

Please note that there is a transcription error in the second bullet of the slide which should state 24 -- subsection 24.6 and not section 6.

A number of intervenors have raised concerns regarding accident coverage and liability insurance for off-site events. BWXT is required to maintain industrial insurance to cover any liabilities from its operations. BWXT is not required to maintain insurance under *the Nuclear Liability and Compensation Act*, as it processes natural or depleted uranium that is not capable

of self-sustaining nuclear reaction.

In a very unlikely scenario of an off-site event, BWXT is responsible under the *Nuclear Safety and Control Act* for any remediation.

The Commission reviewed this topic in detail during the December 2013 Commission meeting and CNSC staff would like to point to the minutes from this meeting, specifically paragraphs 100 to 106 which included an action for the licensee to provide confirmation of liability insurance. After the meeting the licensee provided a letter to the Commission confirming accident coverage.

CNSC staff note that accident coverage should not be confused with the current financial guarantee in place accepted by the Commission for the purpose of decommissioning the nuclear facilities at Peterborough and Toronto.

To complete our technical assessment portion of the presentation this slide provides a summary of CNSC staff's assessment of BWXT's request for authorization to conduct pelleting at the Peterborough facility. CNSC staff assessed this request and concluded that the conduct of pelleting operations at the Peterborough facility would remain within the overall

safety case for the Peterborough facility.

CNSC staff also assessed the potential effects to the environment from this operation and conclude that BWXT has and will continue to make adequate provisions for the protection of the environment and the health of persons.

CNSC staff assessed that BWXT is capable and qualified to safely implement these changes while ensuring the protection of the public and the environment.

BWXT's current license allows it to design, modify, commission and operate new and existing equipment, including building structural modifications and supporting systems.

BWXT regularly carries out equipment maintenance and commissioning activities. These modifications and examples are listed in CMD 20-H2. For example, the addition of sintering furnace controllers for fitness of service and the construction of a reactor refurbishment facility at Peterborough.

The two facility specific licence conditions that CNSC staff recommend for the Commission's consideration is based on the risk of these changes and the administrative aspects of maintaining adequate regulatory

oversight. The two conditions will ensure additional environmental monitoring, as well provide adequate regulatory oversight of these proposed changes, if BWXT's request is permitted by the Commission.

The conduct of pelleting is an authorized activity under BWXT's current license and the licensee is capable of making the requisite changes at Peterborough safely.

With that, I will now pass this to Dr. Caroline Ducros who will continue with the presentation.

DR. DUCROS: Caroline Ducros, for the record.

I will now provide an overview of the public outreach that was carried out and the participant funding that was awarded, and then I will walk through an outline of the key themes we heard from the interventions received.

A Public Information and Disclosure Program is a regulatory requirement for licence applicants and licensees of Class 1 nuclear facilities, uranium mines and mills, and certain Class 2 nuclear facilities. These requirements are found in REGDOC 3.2.1 *Public Information and Disclosure*.

CNSC's expectations of a licensee's public information program and disclosure protocol are commensurate with the level of risk of a facility as well as the level of public interest in the licensed activities.

In December 2013 the Commission held a meeting in Toronto where the licensee's operational performance was discussed. A number of intervenors expressed concerns about the safety of the facility and a lack of public information and awareness. Having heard those concerns the Commission directed the licensee to take action to improve its public information program.

CNSC staff conducted an inspection of the licensee's public information program in June 2014 with enforcement actions directing the licensee to improve the assessment of target audience needs, improved communication products and their frequency, and program improvements related to public feedback.

The licensee took several actions including appointing a dedicated communications manager, creating a new community liaison committee, organizing public outreach and facility tours, additional newsletters targeting local community, an updated website with more information on activities.

The improved PIDP has been in place since 2015 and CNSC staff reported on the progress and subsequent closure of all actions to the Commission as part of the Regulatory Oversight Reports in respective years.

CNSC staff continue to closely monitor the effectiveness of the public information program and the implementation of the action plan as per licensee's commitments to the Commission in November of 2013 Commission Meeting.

Given the concerned citizens in the immediate communities to the operations in Toronto and Peterborough, CNSC staff have an active public engagement plan, including verification of licensee's activities and outreach through the annual compliance reports, participation in most licensee outreach activities including observing community liaison committee meetings, active participation with a dedicated space during licensee community barbeques, visible independent environmental monitoring program campaigns and engagement with local public health officials including the Toronto Public Health and the Peterborough Public Health and the Ministry of Environment and Conservation and Parks to ensure awareness and adequate response to public concerns.

CNSC staff will continue to ensure that BWXT's PIDP meets the changing public information requirements to address safety concerns and information requirements.

CNSC staff, as part of this licence renewal, have been conducting regular public outreach throughout the renewal time period in 2019 and 2020. This included notification of the renewal hearing in June 2019.

CNSC staff participated during licensee's summer barbeques in June in Peterborough and Toronto, and again in October during the licensee open houses, also both in Peterborough and Toronto. CNSC staff met several of the intervenors and concerned citizens during these events and have answered questions and provided information on the operations and regulatory oversight of the two licensed facilities.

CNSC staff conducted a webinar in early January and hosted Meet the Nuclear Regulator sessions in both Toronto and Peterborough in the third week of January 2020.

Staff have also provided a significant volume of information through answering questions addressed directly to CNSC staff and information requests provided

and document requests through the information account or through the Secretariat.

CNSC staff have been in regular contact with the staff of peer agencies like the MECP and Peterborough Public Health providing information on any questions or concerns about BWXT's operations.

In addition, CNSC staff have regular communications and interactions with interested indigenous groups who have an interest in CNSC regulated facilities and activities.

The BWXT sites in Toronto and Peterborough are situated on the traditional and treaty territories of many indigenous groups including the Williams Treaties First Nations, Mississaugas of the Credit First Nation, Mohawks of the Bay of Quinte and the Metis Nation of Ontario.

CNSC concluded that the proposed renewal application would not result in any adverse impacts to any potential or established indigenous or treaty rights.

However, CNSC staff conducted a number of engagement activities to ensure that interested indigenous groups could participate in the BWXT license renewal process, including the Commission hearings. This included

letters sent to indigenous groups in April 2019, meeting with interested groups and provision of the Commission member document, and independent environmental monitoring program results, when available, to indigenous groups.

The CNSC Participant Funding Program, or PFP has been implemented to assist members of the public, indigenous groups and other stakeholders in providing value-added information to the Commission through informed and topic-specific interventions. The CNSC awarded \$37,000 to four funding recipients, listed on this slide, to participate in the BWXT licence renewal regulatory process. The PFP recipients are: Citizens Against Radioactive Neighbourhoods, Lake Ontario Waterkeeper, Curve Lake First Nation, Canadian Nuclear Workers Council.

The Secretariat received 248 interventions for this licence renewal application. CNSC staff reviewed each intervention carefully and created a supplemental CMD 20-H2.B which identifies key things present in many interventions. In the annex to the CMD CNSC staff provide responses for many of key themes presented. The general themes are noted and listed on this slide.

I will now pass the presentation to Ms. Haidy Tadros for the CNSC staff conclusions and

recommendations.

MS TADROS: This is Haidy Tadros, for the record.

CNSC staff conclude, based on our technical assessment of BWXT's application and supporting information, that BWXT is qualified to carry on the activities requested in its renewal application, and that BWXT's request for authorization to conduct pelleting operations at the Peterborough facility is acceptable.

We are confident that this activity is acceptable for the purposes of the *Nuclear Safety and Control Act* because: the requested activities are within this facility's current operating limits; BWXT has the required management system to implement pelleting operations at the Peterborough facility; the hazards associated with the proposed activities are well characterized and controlled; and, BWXT's operations would remain protective of the public and the environment.

CNSC staff also conclude that: based on the cost estimate for the decommissioning plans that have been reviewed and assessed by CNSC staff, BWXT's proposed financial guarantee and the financial guarantee instruments are credible and acceptable.

Based on the aforementioned conclusions CNSC staff recommend that the Commission renew BWXT's nuclear fuel facility licence for a ten-year period with the proposed licence conditions.

We also recommend that the authorization to conduct the pelleting operations of Peterborough facility be granted.

We recommend the authorization, the delegation of authority as set out in Staff CMD 20-H2, as well as accept the proposed financial guarantee and direct BWXT to provide the original financial instruments within 90 days of the issuance of a decision on this matter.

Thank you very much for your attention. We are available for your questions.

THE PRESIDENT: Thank you for the presentation.

We'll take a 15 minute break and then resume with the interventions. So, we will be back at 3:15.

Thank you.

--- Upon recessing at 2:58 p.m. /

Suspension à 14 h 58

--- Upon resuming at 3:15 p.m. /

Reprise à 15 h 15

THE PRESIDENT: Before we move to the interventions, I would like to make a few additional remarks and clarify a few things.

I wish to emphasize that the Commission is a quasi-judicial administrative tribunal and that consequently it is independent from any political, governmental or private sector or industry influence. In fact, each Commission Member is independent of one another and also independent of the CNSC staff.

Submissions filed for this hearing include recommendations to the Commission. CNSC staff also make recommendations to the Commission, but it is the Commission Members who will render a decision based on all the evidence presented in the context of the hearing process.

The Commission Members are appointed by the Governor in Council on the basis of their achievements in their respective fields of endeavour as well as their excellent reputation amongst their peers.

Our mandate is simple: ensure that the use of nuclear is done in a manner that protects the

environment as well as the health, safety and security of the workers and the public.

I would also like to emphasize that the CNSC has no economic mandate and will not base its decision on the economic impact of a facility. The mandate of the Commission also does not include a requirement that licensed activities have community support, local buy-in, social licence or social acceptability.

While it can be understandable that certain intervenors would seek to require social licence from the companies who wish to operate in their communities, the Commission is not mandated to adjudicate social licence considerations. What the Commission does regulate, with respect to community understanding at least, if not social support or social licence, is the licensee's disclosure to and informing of the local population of the nature of the licensed activities. The hearing will address BWXT's efforts in this regard and the adequacy thereof will be a matter for the Commission's consideration.

Finally, as I stated earlier, the Commission is an administrative tribunal. We are pleased to conduct this hearing in the communities that host the

facilities where we can listen firsthand to the views and submissions by members of the public and interested persons and probe the issues on the matters we must decide.

The Commission means to conduct a fair, efficient and transparent hearing. To achieve this and in order to hear from everyone who wishes to be heard and to address the issues the Commission must consider, the Commission will insist on a respectful process. As President of the Commission, I want to set the tone from the outset so that we can all be assured of this.

The Commission will treat all participants with respect and courtesy and expects the same from all hearing participants towards all other participants. Please respect the order of proceedings and the importance of one person speaking at a time. I will expect participants to address their questions and comments through me and not to address each other.

There is much ground to cover and the Commission will not tolerate clapping, disparaging personal remarks, disruptive or disrespectful behaviour. The Commission will take the measures it considers necessary to maintain order during the hearing, including limiting the participation of or ejecting from the hearing room any

person who disrupts the hearing.

The code of conduct for attendance at Commission proceedings is posted and provides clarity on how we will all conduct ourselves. The important issues that have brought us all here will be best able to be fully addressed through an orderly and respectful hearing process.

With those introductory remarks, we will now move to the interventions.

MR. LEBLANC: Thank you, Madame la Présidente.

I would like to remind intervenors appearing before the Commission today that we have allocated 10 minutes for each oral presentation and that a question period will follow each of those presentations, for which no time period is ascribed. So I would appreciate your assistance in helping us to maintain that schedule so that we can hear from all 55 oral intervenors.

Your more detailed written submission has already been read by the Members and will be duly considered. There will be time for questions, as I mentioned earlier, after each presentation.

To help you in managing your time, a timer

system is being used today. The light will turn yellow when there is one minute left and turn red at the 10-minute mark. Thank you.

Madame la Présidente.

THE PRESIDENT: The first presentation is by the Canadian Association of Physicians for the Environment, as outlined in CMD 20-H2.104 and 20-H2.104A.

I understand that Dr. Cathy Vakil will present this submission.

Over to you, Dr. Vakil.

CMD 20-H2.104/20-H2.104A

Oral presentation by the

Canadian Association of Physicians for the Environment

DR. VAKIL: Thank you for the opportunity to participate in these hearings. I am a family physician in Kingston, Ontario and Assistant Professor in the Department of Family Medicine at Queen's University. I am also a Board Member of the Canadian Association of Physicians for the Environment and one of their specialists in the area of nuclear energy and health.

I would like to express concerns about the

recommendation of the CNSC staff to recommend extension of the licence of BWXT Nuclear Energy Canada for 10 more years for their nuclear facilities in Toronto and Peterborough as well as their decision to include uranium pellet production at the Peterborough site.

As I speak, I will address directly the CNSC staff document from February 24th, 2020 because I believe there are false reassurances and false statements in this document and I do have references for studies that I refer to.

Firstly, the CNSC staff minimizes the danger of radiation and especially the radiation emitted by uranium. See items 1 to 4 in the CNSC staff document.

Uranium is an alpha emitter and all alpha emitters are carcinogens. Therefore, uranium is a Group 1 carcinogen according to the IARC. A study done in 2017 on nuclear workers exposed to alpha emitters concluded that alpha emitters, including uranium, are associated with an increased risk of lung cancer even at very small doses.

In many places in the CNSC staff documents, items 1, 2, 11, 12, 14 and 17, health studies that do not show increased rates of illness are mentioned in order to reassure the public that the activities of BWXT

are of no risk to them. It requires significantly elevated rates of illness to show up in epidemiological studies due to methodological issues, especially small numbers, so a negative study or lack of statistical significance does not rule out that an exposure is causing illness in a population.

Item 2 states that human health studies do not show a measurable increase in cancer at exposures under 100 mSv, which is false. There have been a number of studies showing elevated risk of cancer in exposures under 100 mSv, including the lifespan study of atomic bomb survivors in Japan. Elevated childhood cancer rates in children X-rayed prenatally at exposures under 10 mSv are well studied.

Two more studies are referenced below, one on U.K. occupationally exposed workers and one a review study with many references of other studies confirming the increased risk of cancer in doses under 100 mSv.

In addition, I have included a link to a website that lists a number of studies that show elevated cancer risk in doses under 100 mSv.

Most importantly, there are no studies on the health effects of uranium in children, who are known to

be more radiosensitive than adults. Even one DNA breakage from an alpha particle emitted by a uranium atom in the lung can precipitate cancer which may not manifest for decades. All cancers arrive from damage to a single cell, even when the carcinogen concentration is well under the regulatory level, and it is known that even small doses to a foetus can result in childhood cancer.

Item 11 states that no studies show higher risk of cancer in populations living close to nuclear processing facilities. A recent study by the CNSC staff concludes that there are "no large differences in cancer incidences" in Port Hope compared to other Canadian populations. Because of small numbers the study cannot detect small increases in risk, which for people living in these locations are extremely important.

Importantly, the study showed a statistically significant increase in lung cancer in women, which is dismissed in the discussion as being due to smoking, ignoring the fact that exposure to some radionuclides causes lung cancer.

Because of small numbers they combine children 0 to 14 years old together, which would dilute any increase in leukemia in children under five who have been

shown in other studies to be at increased risk if they live near nuclear reactors.

They also counted cases within 25 kilometres of the nuclear facility when the increase in cancer, especially in children under five, has been demonstrated in studies of populations living within 5 kilometres of a nuclear reactor. So this large radius would dilute any increase present within 5 kilometres.

These limitations make the conclusion that there are no adverse health effects attributable to the nuclear processing facility in Port Hope a false statement.

The legal mandate of the CNSC is to protect human health first and foremost. One of the basic principles of radiation protection is that all unnecessary exposures to ionizing radiation should be eliminated unless there is clear justification. The residents surrounding the BWXT facilities in Toronto and Peterborough are being forced to accept increased health risks with no benefit to them at all, which clearly contradicts basic principles of radiation protection.

Beryllium is also of concern regarding children's exposure to BWXT's emissions in Peterborough. Like uranium, it has not been studied in children. Chronic

beryllium disease is often fatal and can declare itself many decades after exposure ceases. Beryllium is also toxic to the kidneys, liver, heart and nervous system. Based on multiple occupational health studies, the IARC considers beryllium to be a Group 1 carcinogen.

Items 14 and 17 statements about beryllium not causing cancer in exposed workers is false as there are many studies that show this. Community-acquired CBD has been described in some studies in residents living up to 8 kilometres from a beryllium facility. This is concerning, considering the presence of a beryllium facility such as BWXT in the middle of a neighbourhood, as is the case in Peterborough.

For physiologic and behavioural reasons, children are at more risk than adults in almost every toxic exposure. Therefore, items 12 and 15 are of great concern. The CNSC staff admit there were no studies of beryllium in children, that it is unknown whether there is an increased risk for children compared to adults, and that animal studies are inconclusive. They then say that the levels found, though they do not actually monitor them, are protective of human health, including children, and insist there is no risk to children at the Prince Of Wales Public

School. How can we know that levels are safe if there are no studies in children and if there is no monitoring of soil levels? This is not logical and not reassuring.

As mentioned above, BWXT does not measure beryllium levels in the soil in the surrounding neighbourhood in Peterborough. The only levels taken in the past five years are few measurements done by the IEMP -- by the CNSC in 2014, '18 and '19. These show a concerning increase in soil concentration, particularly the measurements at the school yard.

The CNSC staff say that any accumulation of beryllium in the soil is not from the BWXT facility, Item 32, but give no explanation as to what may be causing it. If this doubling trend were to continue, levels would be over the "safe limit" in a few years, making ongoing monitoring extremely important.

Whatever the cause is of these increased soil levels, it is mandatory that this is explored and corrected, and what is absolutely necessary is that ongoing, frequent monitoring is essential to make sure these children are safe. Because we know nothing about the effects of beryllium on children, caution is mandatory.

Uranium levels are measured at the BWXT

plant in Toronto and in the neighbourhood soil surrounding it. According to BWXT's annual compliance monitoring reports, in Toronto soil levels are measured once a year in only 14 locations in the residential neighbourhood surrounding BWXT and the exact locations are not evident in the report. It is very possible that this method of measurement could miss a large reading somewhere in the residential area which could cause an increase in health risk to local residents.

MR. LEBLANC: Excuse me, Dr. Vakil --

DR. VAKIL: Yes...?

MR. LEBLANC: -- I am going to give you a few more minutes, but if you could just diminish the pace, the interpreters cannot follow you.

DR. VAKIL: Oh, okay. Sorry.

MR. LEBLANC: Okay. Sorry.

DR. VAKIL: Sorry.

MR. LEBLANC: So I will stop the clock and let you go.

DR. VAKIL: Okay.

MR. LEBLANC: Thank you.

DR. VAKIL: Although I have talked about the importance of monitoring here, the fact is that if

there is a breach in the emissions barriers of beryllium or uranium in the stacks and a subsequent elevation of air and soil concentration in the neighbourhood, monitoring is too late, the exposure has already happened. The fact is that breaches occur, accidents happen and mistakes are made.

Examples are Shield Source Inc. in Peterborough where the company underreported tritium emissions manyfold for 10 years and levels reached more than double allowable levels. Similarly, at SRB Technology in Pembroke, local groundwater and soil tritium levels reached up to 80 times allowable levels in 2006 due to error.

These errors caused increased exposure to tritium in local populations and the health effects may never be known. If a mistake is made regarding the in-stack beryllium or uranium measurements and there is inadequate or no soil monitoring in the neighbourhood, the public would be exposed to high levels of beryllium or uranium until the mistake is noted and rectified, which would be too late.

Recommendations:

The CNSC should deny BWXT a licence until it presents a reasonable plan for regular frequent

monitoring of beryllium soil levels in the neighbourhood surrounding the facility of the Peterborough site, especially on the school grounds.

BWXT should also be required to present an explanation for the increased soil levels of beryllium on the schoolyard found by the CNSC IEMP and to reveal a plan to immediately remediate the cause of this increase in soil levels.

The CNSC should deny BWXT a licence until it presents a reasonable plan for regular frequent monitoring of uranium in the neighbourhood surrounding the facility at the Toronto site, especially at playgrounds and schools in the vicinity, and similarly at the Peterborough site if uranium pelleting should occur there.

The CNSC should consider moving all nuclear operations, including uranium pelleting and fuel bundle assembly to sites far away from where people live, similar to what is done in other countries, instead of in the middle of cities, in residential neighbourhoods and near schools.

Thank you.

THE PRESIDENT: Thank you for the presentation.

We will start with you, Dr. Demeter.

MEMBER DEMETER: Thank you very much. Thank you for your presentation. The beryllium issue I will be discussing at length through many of the intervenors and asking questions related to the same themes that you brought up.

I wanted to put some perspective on radiation dose and I think it's important to understand how the radiation dose was calculated to the public for this facility. Maybe if CNSC could speak to how that was calculated and if it included gamma, alpha and beta, and whether it included source -- specifically for uranium and the biokinetics. And then after they tell us how that was -- what the methodology was, then we will talk about the published result in the CMD and give that some perspective on what amount of radiation that is compared to other things that people can understand.

So maybe if CNSC could walk through how they calculated the public dose, both internal and external.

MS TADROS: Haidy Tadros, for the record.

So I think your question is in two parts. The first one is with regards to how we calculate the

public dose and the second one was the biokinetics of uranium.

MEMBER DEMETER: I wanted to get some specificity that the public dose includes both an external component and an internal component and that internal component is specific to the compounds that are coming out of this plant, uranium for example, and that includes the biokinetics. Confirm that.

MS TADROS: Thank you. Haidy Tadros, for the record.

So I will ask our environmental protection specialist to take the public dose and how that is calculated and what is included in that. And we may need to also call for our internal dosimetrist who is in Ottawa to complement that response as well.

MS SAUVÉ: Kiza Sauvé, for the record.

So I'm going to give the overview and then we will turn to our dosimetry specialist in Ottawa.

But the public dose includes the gamma at the fence line -- and I have lost my train of thought. So we are going to turn to Bert and then we can come back and add on anything more. So if we can go to Ottawa, please.

MR. THÉRIAULT: Bertrand Thériault, for

the record. I am a dosimetry specialist with the CNSC.

So the way the public dose is calculated for the BWXT facilities is, on the one hand, to consider the external dose, that is dose to a person that is assumed to remain at the fence line 24 hours per day, 365 days per year, external dose from material onsite. In addition to that, the dose is also calculated for the intake, that is, the inhalation of UO₂ particles released from the site.

This assumption also -- those calculations also assume that a person remains at the fence line 24 hours per day, 365 days per year. The doses are calculated for different age groups, infants, toddlers and adults, and in this case the most limiting dose is that to the toddler, 2-to-5-year-old. This is because of the dose per unit intake or the dose received per becquerel taken into the body in addition to their breathing rate.

So once taken into the body, when inhaled uranium is retained in the lung, the UO₂ is an insoluble alpha emitter. So the dose takes into account all alpha particles released, beta particles, gamma radiation once they get into the body.

As they are absorbed in the lungs and absorbed -- and taken up by blood and deposited in the

various organs and tissues, the biological effectiveness of each of these types of radiation is taken into account. So a radiation weighting factor of 20 is used for the alpha particles as well as their distribution over time after the material is taken into the body. So there is an integration period of 50 years for the adults and up to age 70 for infants and toddlers.

MEMBER DEMETER: Thank you.

And so I just want to, for the audience, put that in some perspective.

As I understand it, the dose at the fence for someone that is there 365 days a year, 24 hours a day is less than .001 mSv, and based on my profession in diagnostic imaging that's the dose you would get from a hand X-ray. That's the public dose that someone that's sitting on that fence for 24 hours a day all year, taking into account the alpha particles, the internalization, the 50 to 70 years of integration.

So I have to put that dose into perspective, because that's the data we have and we have made it on the worst-case scenario based on the most vulnerable person, the dose of an extremity X-ray. So I'm not sure -- and unfortunately, I didn't have any of the

studies that you talked about in your -- you didn't have a bibliography or reference list.

DR. VAKIL: I just made this up recently, but in response to last week's email --

MEMBER DEMETER: Yes.

DR. VAKIL: -- about the new CNSC staff document.

MEMBER DEMETER: So I can't speak to the references that you brought up verbally, but I can speak to the health effects that staff have commented at the fence line is equivalent to a hand X-ray, which I'm sure you order on individuals without giving them concerns about the one photon that will break one DNA particle from that.

DR. VAKIL: No, I do actually. I do, because I take radiation very seriously and I think that any extra health risk due to uranium or beryllium emissions is unjustified. Because the people in the area, particularly in Peterborough -- well, in Toronto as well, they are being forced to accept an extra health risk without any justification, because they don't benefit from this.

In addition, I also am concerned about there being no -- very -- either no or inadequate soil

monitoring, which is I assume a result of the air monitoring. And if there is some kind of error also in the air monitoring, then, as has happened before, I gave the example of Shield Source and SRB in Pembroke, the device for measuring was faulty. If this were to happen in Peterborough or in Toronto, then the resulting exposure to the public is much more elevated than anybody knows. And if you are not monitoring the soil on a regular basis, you wouldn't know this.

MEMBER DEMETER: Thank you, yes. I will hold my other questions till --

THE PRESIDENT: Well, why don't we follow up on those concerns. Maybe staff can share with us. How do you oversee that what BWXT is reporting is correct as far as emissions?

MR. RINKER: Mike Rinker, for the record.

So maybe I can tie in the logic of what we require for monitoring and then make a comparison to I think where the intervenor correctly identified some faulty monitoring for Shield Source as an example.

So generally, and if we use Toronto as an example, we require monitoring of effluent uranium going out the stack and the results of that inform how far we

require monitoring. So we require ambient air monitoring because there is measurable uranium in the stack.

The ambient air monitoring outside the perimeter of the facility shows measurable uranium below the standard, so safe levels but present, and so we require that facility to go one step further and to measure soil. And in soil, the facility has been there since 1955, we do not see an accumulation of uranium in the soil. It's still at background levels that you would find anywhere else in Toronto. So we don't require the next step, to go to groundwater monitoring for example.

In Peterborough, measuring emissions are already meeting the criteria for ambient air monitoring. So we do require ambient air monitoring for confirmation, but we don't go the extra step of requiring soil monitoring in this case.

THE PRESIDENT: But if you can go one step further and share with us, how do you confirm that what is being reported as emissions is actually correct, that we don't have a Shield Source where 10 years went by -- I think you said 10 years where there was faulty reporting happening and that the CNSC had not picked that up?

MR. RINKER: Mike Rinker, for the record.

So we did from the onset understand that there was a disconnect between, at Shield Source, what was going up the stack and what was being measured in the environment. We tried variations in modelling and we couldn't understand the disconnect, so we did not rely on the air emissions to calculate public dose, we relied on the ambient air in the water samples. So the public dose was always calculated correctly, but there was the disconnect and trying to figure out why there wasn't a match.

So we do get a match. We can understand using the standard for public dose calculation that stack emissions should relate to ambient air monitoring, which should relate to soil concentrations, and if there is a disconnect between what we observe and what is modelled, then we investigate. And in this case with BWXT we do not see that disconnect.

THE PRESIDENT: And is there either by the CNSC or any other third party that looks at how those emissions are calculated, how the stack is sampled and is that accurate, is that done?

MS TADROS: Haidy Tadros, for the record. Perhaps we can ask our Inspector that goes

to BWXT in terms of your questions around verification and how staff verify not only the programs but that the programs meet requirements.

MR. AMALRAJ: Julian Amalraj, for the record. I am the Inspector of the facility there.

So the program aspect of what is monitored and how it should be monitored is established by the Environmental Protection Program, based on the environmental risk assessment and associated justification. Once the program is established, CNSC verifies that the licensee is in compliance with the program and the associated activities through our Compliance Verification Program and onsite inspections.

During this process we actually take a very systematic approach where we first look at the equipment, the associated calibrations, the flow rates that are mandated, the ranges that are supposed to happen as well as any independent calibration, like for example the uranium through a delayed neutron activation analysis from a third party which is not the licensee. And those provide us the requisite defence in depth in terms of assuring us that the program as designed is appropriate and is monitored as what it is supposed to be.

On top of that, on a periodic basis the licensee is also requested to do a complete third-party review of stack emissions through an independent third party and we can confirm through our inspections that the licensee has done that.

MS TADROS: So Haidy Tadros, for the record.

Maybe just to complement one last point is the Independent Environmental Monitoring Program that then overlays a lot of the activities we do offsite to ensure, as Mr. Rinker explained, that the consequences of what we are seeing onsite are again monitored and overseen offsite.

So with that, I would ask Kiza Sauvé to explain the Independent Monitoring Program and how it complements the compliance verification activities.

MS SAUVÉ: Kiza Sauvé, I am the Director of Health Sciences and Environmental Compliance Division.

So the Independent Environmental Monitoring Program is a program CNSC staff complete on a periodic basis around the facilities that we regulate, every two to three to four years, and it's a spot check. So we do go out and we do some air and water and in some cases soil or sediment sampling to look at what we are

seeing in the environment and so we can correlate that back to see if the emissions are what we're expecting to see in the environment. And we compare those results to a sampling program, if the licensee has it. We compare those results to any typical background ranges that might exist in Ontario or where the facility is located.

And to add one more thing to the discussion we've been having, BWXT is also required to have environmental compliance approvals for their emissions from the Ministry of the Environment, Conservation and Parks. So they're required to submit all their documentation to the Ministry of the Environment, Conservation and Parks, so they have those compliance approvals as well. So there is another party also looking at their emissions.

THE PRESIDENT: Thank you.

BWXT, did you have anything you wanted to add to this?

MR. SNOPEK: Dave Snopek, for the record.

Just that we have reviewed in particular our beryllium stacks and the monitoring that we do on those as part of the review. When the 2019 IEMP results came out, we looked at the monitoring equipment, we looked at calibrations, we looked at the calculations. We do that

periodically, but we looked at it specifically in this case and we have confidence that things are being measured as they should and we have confidence in the results that we have reported for the licence period.

THE PRESIDENT: Thank you.

Dr. Berube...?

MEMBER BERUBE: Thank you very much for your intervention. It's always good to have experts come and offer their advice as to what we should be looking at during these hearings and how we protect the safety of the public. That's what we're here for.

What I have been hearing for the last couple of days from all the intervenors actually is really the question: What is the safe dose limits? So I want to get into this really quickly, because in every science there is ambiguity. There's one study that says one thing, there's a bunch of studies that say something else, and so I'm going to ask CNSC: How do you come about deriving safe dose limits and exposures? Is it based on meta-analysis, based on years of experience? How do you actually filter through all of that information and then derive what is something that is safe to the public?

MS TADROS: Haidy Tadros, for the record.

So I will ask our radiation protection specialists to describe their work with regards to the international research that is done through UNSCEAR and the International Commission on Radiation Protection, how internationally dose rates and dose levels are established and then how we use that within our regulatory framework in our *Radiation Protection Regulations*.

MS PURVIS: Good afternoon. It's Caroline Purvis. I am the Director of the Radiation Protection Division, for the record.

With respect to the dose limits that are prescribed in the *Radiation Protection Regulations*, these are taken -- are derived essentially by various international bodies, which Canada adopts their recommendations.

The United Nations Scientific Committee on the Effects of Atomic Radiation study the literature and look at the science in determining effects of radiation. Their outcomes are shared with the global community.

And the next international body, which is the International Commission on Radiological Protection, or the ICRP, bring together experts from across the world to look at a number of different domains, but in doing so they

bring forward what are called their recommendations. Their recommendations look at the science that is published by UNSCEAR in developing a system of -- or a framework of radiation protection, as it were, and they put forward recommendations for dose limits.

Internationally then countries that belong are member states of the International Agency -- the IAEA, so the International Atomic Energy Agency. They essentially publish and look at the science produced by UNSCEAR and ICRP and come to a global consensus on standards for radiation protection worldwide, with the hopes that member states will adopt those standards within their national legislation.

So with respect to Canada, the CNSC looks at the work of all these international bodies. We have representatives that sit on those various committees and we bring forward recommendations to adopt those standards into our national legislation. Our *Radiation Protection Regulations* currently align with international recommendations in this regard for the protection of workers and the public.

MEMBER BERUBE: So if I could just expand on that very quickly. Is this based on the work of 10

studies, 100 studies, 10,000 studies, 100,000 studies? What are we looking at when these kinds of recommendations are being made? Are we talking a handful or are we talking thousands or tens of thousands and how many people are really involved in this, how many people are really making -- taking a good look at this and saying this is reasonable?

MS PURVIS: Caroline Purvis.

So I sit on the Radiation Safety Standards Committee, which is representing Canada's interests at the IAEA. We do have affiliations with ICRP, and myself, I haven't sat at UNSCEAR, but taking my experiences and those of my colleagues, what I can say is that it's based on thousands of literature reviews, hundreds of internationally highly-regarded experts and many, many years of science and implementation coming forward and bringing together a holistic and robust framework of radiation safety.

THE PRESIDENT: Dr. Lacroix...?

MEMBER LACROIX: Thank you, Dr. Vakil, for your presentation.

I would like to know, what is berylliosis? How do you pronounce it, berylliosis?

DR. VAKIL: Berylliosis. It's from exposure to beryllium, chronic exposure to beryllium.

MEMBER LACROIX: Okay. How do you catch it, I mean through exposure to --

DR. VAKIL: It's from inhalation.

MEMBER LACROIX: Inhalation essentially?

DR. VAKIL: Yes. And almost always it's from occupational exposure.

MEMBER LACROIX: Okay.

DR. VAKIL: But it has been shown in some -- a few studies found chronic beryllium disease -- that is the other name for it -- can manifest decades later in people surrounding a beryllium facility as much as 5 miles away, who have nothing to do with the facility. And that is why I brought that up here, because this has a bearing on what is going on in Peterborough, because most of these facilities are not in the middle of cities.

MEMBER LACROIX: It is essentially a lung disease?

DR. VAKIL: It's a lung disease.

MEMBER LACROIX: I see.

DR. VAKIL: It's not -- yes. And it's often fatal. It requires usually steroid treatment for

many years and it's progressive.

MEMBER LACROIX: Have you ever had a patient that was --

DR. VAKIL: No. Where I work there is no beryllium facility. It's really just from beryllium exposure and it's almost always occupational.

THE PRESIDENT: Dr. McKinnon...?

MEMBER MCKINNON: Yes.

Thank you for your questions. I would like to return to your point about soil. These have been addressed earlier, but there are actually many, many issues related to soil sampling and we will be returning to them with future intervenors as well.

But your particular concerns that you mentioned in your written submission and you mentioned now, how do you know you are getting the right readings and the right locations and can you miss some significant event. So I will talk generally about, you know, the source in the industrial process and then how it is dispersed and then how it settles and how we measure it.

So there's a very interesting slide in BWXT's presentation, number 40, which shows the emissions monitoring is done daily, the water -- the air at the

boundaries weekly and soil sampling is done annually. So this reflects changes in the frequency.

So my first question is to CNSC staff. It's related to establishing an adequate representative frequency to make sure that you are picking up the correct variations that are representative of the process in the facility and whether you're detecting, you know, frequent emissions that might occur or spikes versus the longer-term trends that may occur further away.

Could you address that issue of frequency and how you determine that for the different types of measurements?

MR. McALLISTER: Andrew McAllister, Director in the Environmental Risk Assessment Division.

So with any kind of monitoring program there needs to be an objective. So we take a step back with respect to what we're seeing in the environmental risk assessment. There were minimal risks being identified from the soil perspective. As Mr. Rinker mentioned, findings were within background levels, below the most restrictive guidelines of 23 milligrams per kilogram. That's residential or park land use.

The objectives of the soil program are

largely, as you alluded to, related to is there an accumulation over the long term of uranium and it's structured in such a way as to be able to detect those kinds of trends. That's why when we see results for example like we've seen in the Independent Environmental Monitoring Program, one shouldn't infer long-term trends from sort of very limited data.

So in the case of what the intervenor raised, the goal is the long-term --sort of the accumulation looking at the long term. If we look at the findings from BWXT Toronto, if you look at that time series, you do see variations within the dataset. If we were to randomly block out a couple of years, you may look at it and go, oh, there's an increasing trend happening there, but when you actually compete your time series you're seeing that, okay, it is part of sort of natural variability that we are seeing, that we are expected to see when looking at a program like that.

What I will say is we have Dr. Michael Ilin, who is in Ottawa, who is an Environmental Risk Assessment Specialist who has years of experience dealing with soil monitoring programs both at BWXT Toronto as well as the Port Hope area, and perhaps if Dr. Ilin can add any

other information to my response.

DR. ILIN: Good evening. For the record, my name is Michael Ilin. I am an Environmental Risk Assessment Specialist.

It is perhaps important to clarify what the accumulation in soil is. The soil concentration at a particular location from airborne deposition is determined by many factors such as distance to the source of emission, wind frequency and wind direction, local topography, presence of vegetative cover, varying removal process due to the chemistry and soil types for example, particle size and their solubility and the soil disturbance, et cetera.

Accumulation or build-up of soil concentrations occur when deposition of contaminants from the air is not compensated by the process of their removal from the surface soil. In general, this process is very slow. It depends on site-specific conditions. Given the time frame, it's not always possible to detect statistically significant changes in small concentrations of uranium and beryllium from year to year, and therefore, there is no regulatory requirements for the, for example, frequency of sample.

Monitoring is typically for determining

long-term patterns of uranium accumulation rather than measuring routine variation over short term, for example, annually.

Thank you.

MR. JAMMAL: Dr. McKinnon, it's Ramzi Jammal, for the record, here.

I think we like to put it in envelope, what it means with respect to the monitoring and why we're going in such depth.

No licence is issued without environmental determination. Part of the environmental determination, there is the environmental risk assessment by which we determine the bounding elements that the licensee must comply with. As part of the licence, they must have an environmental program in place by which imposes in the monitoring and the verification again what was the bounding elements to ensure that the operations and the operation they conduct is within the approval and the EA determination.

So there is a lot of processes in place and programs in order to ensure that the licensing basis determination that was done at the time the licence was issued and ongoing -- it's not just once, it's ongoing all

the time verification being done. That's what we impose on the licensee verifications. So if someone puts that slide as it was on the screen where they have daily verification, they have weekly verification, and they have an annual verification.

In addition to these verification, to ensure that the limits and the bounding elements are controlled by the licensee, as we discussed in Toronto, we impose on them action levels, administration levels to determine any variability.

So if the bounding element at the stack is controlled, the emission from site or beyond the stack is negligible. So that's why my colleagues were saying there's no regulatory requirements, because if you measure the stack and you don't pick up any releases, then it's a determination. So it becomes a sampling issue that rises on regulatory requirements for that verification.

And that's key to put all of this into perspective. It's not just one point. It's a whole process from the beginning, ongoing. And they are required to establish an EA program that my colleagues are talking about in specific details.

MEMBER MCKINNON: Yeah, thank you for that

clarification.

Really what I was looking for is an explanation of the methodology, the underlying methodology. I understand, you know, the actual measurements are well, you know, below thresholds. But should anything occur, is there a good overall methodology in place to detect that?

Which brings me to my follow-on question for the company, and again in connection with the monitoring program. Instruments fail, there is wind directions, lots of factors. How do you build in redundancy of measurement in your monitoring program? Could you give some examples?

MR. SNOPEK: Dave Snopek, for the record.

Maybe we can put the slide up. I think, John, is it slide 30?

--- Off record discussion / Discussion officieuse

MR. SNOPEK: Slide 30, I believe, in the presentation.

MR. MacQUARRIE: Forty.

MR. SNOPEK: Forty, thank you.

So this is talking about Toronto. In terms of the barriers that are in place, we've talked about those in terms of containing process -- material within

process equipment within the room and within the building.

We also do the monitoring of the emissions in the stack. We monitor those stacks on a daily basis. So we get a result every day. So there's somebody going to that equipment on a daily basis that's taking the filter paper out, but also verifying the flow on the sample tray.

Additionally, we do a calibration of the sample flow on a periodic basis. So for small variations in, you know, in pump draw and whatnot, those get changed on a periodic basis and recorded, so that we understand what the sample flow rate is at each of those locations.

We also do checks of the bulk flow rate of the stack.

So there are several opportunities over the course of maintaining and collecting the data, actually, where we're checking on that equipment and the health of that equipment. So we would identify actually on a daily basis if, for example, a pump had failed, because we have the ability to see what the draw flow is on each pump. And if it's failed, there would be none, and we would then intercede and go and change that pump out.

MEMBER MCKINNON: And just one final point. You've mentioned, like, how you check each piece of

equipment and, you know, look at the individual readings. But do you also sort of correlate them so if you have a reading in one location, you might expect something at another location, and the data shows that, do you do an overall sort of integration of your different data types to make sure they're telling the consistent story?

MR. SNOPEK: Dave Snopek, for the record.

There are certainly opportunities to do that. For example, we have five boundary monitors around the facility in Toronto on the fence line that are drawing air, again, through filters. If there was an abnormal result and we were investigating on, for example, one of those boundary monitors, we would be looking at the results of the neighbouring and in fact all of the boundary monitors at the facility to see if that's something that's observed on all of them.

We would then also be correlating to stack emissions -- you know, did we see anything unusual in terms of the stack emissions -- as well as operations -- were there any unusual operations that were occurring at the facility that might have the potential to lead to any sort of a release.

So we look at all of the monitoring data

that we have when we're doing an investigation as well as all the operational data that we have.

MEMBER MCKINNON: Thank you.

Did that address some of the concerns about the sampling program?

DR. VAKIL: Well, I would say there's absolutely no beryllium soil sampling going on in Peterborough. It was the IEMP that picked up this increase of 134 per cent. And yes, it's under the regulatory level, which of course we don't know what that really is for children, by the way, and this was on the schoolgrounds.

But it should not be the IEMP that picks this up and then continues to monitor it. This should be ongoing, regular, frequent, all over the neighbourhood, especially the school by BWXT. And that should be mandated.

THE PRESIDENT: So we'll get to the whole beryllium issue later. We were right now with your intervention looking at the uranium and the sampling.

And even for the uranium, you did say -- I think I heard you say that there are no studies of the impact of uranium on children. And if the most critical receptor is the child, and in Toronto facility where the

air emissions are about one per cent or so of the limit, is that true that there really isn't any studies around impact of uranium exposure on children?

MR. RINKER: Mike Rinker, for the record.

So I think that that was actually the intervenor talking about beryllium and our dosimetrist, Bert Thériault, did talk about, you know, the impacts on children for uranium and what those studies were based on.

THE PRESIDENT: So let me just confirm that with the intervenor, because I actually made a note for both, no studies of uranium impact on children as well as --

DR. VAKIL: The epidemiological studies on uranium are largely adult males, because they're on uranium workers.

THE PRESIDENT: So, staff, any comment on that?

MS RANDHAWA: Kristi Randhawa, radiation and health sciences officer.

So in terms of uranium, we do have studies on workers. We also have Gulf War veterans. But we also have environmental studies which look at populations who live near uranium processing facilities, which can include

children. And we also have drinking water with elevated uranium levels, which includes children as well.

So from these studies, all that we have seen is alterations in kidney functions. As the intervenor mentioned, there has been some evidence of lung cancer in workers, but these have been weak associations and have not been proven to be causal.

However, as an epidemiologist, I do recognize that there are limitations in epidemiology studies. But for example, the United Nations Scientific Committee on Atomic Radiation or Effects of Atomic Radiation do include in vivo, in vitro, and epidemiological studies to determine the health effects due to uranium. So all of these are taken into consideration.

THE PRESIDENT: Thank you. So --

DR. VAKIL: Can I just say one more thing, though?

The epidemiological studies largely looking at uranium workers and people that live near uranium mines, the numbers are always very small, and the numbers of children are very small. And as I said right from the beginning, and the epidemiologist would know this very well, you need very large numbers to show slight

increases in disease. And that's why there are no studies done in children.

THE PRESIDENT: Thank you.

So any final comments from you, Dr. Vakil?

DR. VAKIL: Well, I would just say that nobody can say that there is no impact -- health impact on the public. You can say there is no measurable impact on the public, because basically all international regulatory agencies, radiological, agree with the LNT, which is the linear no-threshold model, which means that all radiation is harmful, even slight amounts, as are emitted in Toronto from the BWXT.

And also from beryllium, there are beryllium emissions; they are above background. So these are all having a health impact, even if they're not measurable.

And the only way to correctly say there is no health impact is to not have these facilities in the middle of neighbourhoods in the middle of cities near where children are.

THE PRESIDENT: Thank you for your intervention.

The next presentation is by Justice, Peace

and Integrity of Creation Office of the Sisters of St. Vincent de Paul, as outlined in CMD 20-H2.122 and 122A. Dr. Jeremy Milloy will present this submission.

Dr. Milloy, the floor is yours.

CMD 20-H2.122/20-H2.122A

Oral presentation by

**Justice, Peace and Integrity of Creation Office
of the Sisters of St. Vincent de Paul**

DR. MILLOY: Thank you very much. Thank you for giving us the opportunity to be part of this process and speak here today.

A brief note about who we are. The Sisters of Providence of St. Vincent de Paul are an order of women religious founded in 1861 in Kingston, Ontario. Dr. Vakil and I could have perhaps carpooled, but I didn't know that we were both coming at the same time.

The sisters as an order are founded as a community-minded order as opposed to, say, a monastic order. So that means that they've always been very active in their local community and have expanded to provincial, federal, and internationally over the years. And their

focus has been to seek to empower others, especially the poor and oppressed, to achieve a quality of life in keeping with their human dignity.

So as that went on in the mid-1990s, the sisters founded the Justice, Peace and Integrity of Creation Office to advance their work on peace, social justice, ecology, education, wellness, and spirituality on an ongoing permanent basis in communities. And as I said, we are active municipally, provincially, and federally.

In 2019, the Sisters created a new position, Lead Integrity of Creation and Climate Change, to advance this work. So in that role, I educate, organize, and advocate for climate change mitigation, adaptation, and climate justice at those three levels.

Just to be very specific, my intervention -- our intervention today will only focus on the climate change aspect of this proposed licence renewal, and it will also focus on that part of the licence renewal which speaks to BWXT's proposed Peterborough operations.

So in 2019, the City of Peterborough declared a climate emergency. And in response to this emergency, the city and other regional stakeholders have created a climate action plan, aiming to increase

sustainability across all 10 municipalities, the Curve Lake First Nation, and Hiawatha First Nation.

So as we know, change in climate requires mitigation, and I think a lot of the focus of climate change awareness discussion is on the mitigation piece; right? What can we do to reduce emissions, to move towards greener energy, and to avoid, you know, warming below 2 or 2.5 or 3 degrees Celsius this century, and the catastrophic impacts that we know that would create.

However, we also know that we have already changed our climate. We have a certain amount of climate change that is baked in that is coming, and we have a certain amount of climate change that we are already living through currently. So while much of the focus is on mitigation, climate adaptation is also incredibly important.

The City's own plan notes that provincial data shows that the average temperature is up 1.4 Celsius over the past 60 years and that provincial temperatures could rise between 2.5 and 3.7 degrees Celsius by 2050. These rising temperatures will, if US studies are any guide, create greater risk of transportation accidents. They will also create an increased probability of extreme

heat, flooding, and extreme wind events in Ontario communities.

Of course, the local community here is certainly familiar with extreme weather events and the destruction that they can wreak on the local community. As somebody who grew up in Peterborough, I certainly remember the 2004 storm that dumped 14 billion litres of water on Peterborough, causing severe flooding, particularly because I tried to ride my bicycle to school that morning.

Here's where we come to the core of our intervention. The reality of a changing climate in the Peterborough region and the local First Nation regions, commitments to climate change adaptation resilience, I would argue, require any application such as this to be looked at afresh to see how climate change affects the overall risk envelope of the activities being applied for.

And it is our view that the BWXT licence renewal application does not pay sufficient attention to what a changing climate demands of its proposed Peterborough operations.

And I've had the opportunity, of course, to review some of BWXT's documents and some of staff's recommendations. And I've learned more by listening to the

submissions here today. So I've gotten certainly an education in some of the environmental monitoring, environmental risk assessment that goes on.

However, in any of these written or oral materials that I've reviewed, climate change and, you know, the possible risk change does not seem to be front of mind in terms of possibilities.

So what do those emissions look like? BWXT's environmental risk assessment and application do not specifically address sustainability as it relates to climate change adaptation and neither do they integrate adaptive management as a frame work to ensure safe operations that are responsive to -- and I'm only going to focus on number one here -- I'm aware of, you know, the particular parameters of our hearing today -- a changing climate and its increased occurrences of extreme weather and natural disasters.

And that changing weather, I'd like to point out, you know, we have models for what that looks like. But these kinds of things are, by their nature, unpredictable and so, I would argue, require the ability to be adaptive, to be mobile, and to be responsive as a changing climate demands.

So to that end, the environmental risk assessment's temperature, wind, and precipitation data only cover 1981 to 2015. So this does not account for how our region's climate may change over the next 30 years. Also the ERA in its entirety does not consider how climate change affects the project's possibility environmental impacts.

This is an example from the Climate Atlas of Canada on current warming trends, the amount of heavy precipitation days, for example, over the next 60 years.

If you want, you can also go onto the Climate Atlas website, type in Peterborough, take a look at what it says in terms of, you know, extreme weather events, extreme precipitation, et cetera.

I'd like to conclude with our recommendations.

First, we recommend that the request for a 10-year renewal be denied, because such a time frame is too inflexible to assess and address changing local climate and changing environmental concerns brought up by a warming climate and underlined in the community's own climate action plan.

JPIC also supports CARN Peterborough's

recommendation that the CNSC must require BWXT to provide a detailed explanation of how the guiding principles of sustainability, precaution, and adaptative management were applied in this analysis with particular attention to the impacts of a changing climate and the known unknowns that a changing climate presents us with.

And finally, JPIC also supports the recommendation that a greater range of nuclear projects and facilities should be designated for review under the new federal *Impact Assessment Act* so that we can have a more robust consideration of how these facilities and the communities that house them can best adapt to a changing climate.

Thank you very much for your attention.

THE PRESIDENT: Thank you for your submission, Dr. Milloy.

Dr. Lacroix?

MEMBER LACROIX: Thank you very much for your statement.

I'm a little bit confused, here. You do not recommend a 10-year licence. But on the other hand, the time scale of climate change is at least of the order of decades. So it seems that you're dealing on two

different time scales here, depending on your point of view. So could you elaborate on this?

DR. MILLOY: Absolutely. You know, as a trained historian employed by the Catholic Church, you know, usually we think in centuries (laughs) or even longer time frames than that.

But with respect to that, I mean, obviously climate change is, yes, something that will affect us, unfortunately, for at least the next century. However, what I think that requires, because there are so many factors that affect a changing climate and, thus, so many possible outcomes, right, I believe often the public and the discourse around climate change can treat it like it's a light switch. Like we're either going to have climate change, or we're going to save the day and not have climate change, when really everything we do to mitigate emissions and to prepare pushes us in a positive direction; everything we do to delay and increase emissions pushes us in a negative direction.

So what I'm saying is even though it's going to happen over a century or more, there is such a wide range of possible outcomes and possible changes in the near term, that I think it's of the utmost importance that

projects like this are able to respond quickly.

And thus I worry that a 10-year licence is going to bake in things at a certain level. And if things change within five, six, seven years, we're not well-placed to address those.

THE PRESIDENT: Dr. McKinnon?

MEMBER MCKINNON: Yeah, thanks for bringing up some interesting points. I think the time scale and extremes -- very interesting.

So I'd like to relate that to the emissions. So what's going on in the plant will be more or less constant or within certain bounds. But what happens to the emissions once they exit could be affected by wind and rainfall and so on.

I know in the submissions that there have been things such as dispersion models, for example, based on wind. So when the modelling is done -- so my question would be, first of all, is it CNSC does the dispersion modelling? Or is it the company?

MS TADROS: Haidy Tadros, for the record.

So it would be BWXT that provides, according to the requirements of having the programs in place, to submit information to the CNSC. But CNSC staff

do their own verification and independent modelling of the information provided by the licensee.

MEMBER MCKINNON: Thank you. So I will direct the question to the company.

When you're planning your monitoring program, both air emissions and the soil sampling, to look at the locations and the frequencies and so on, when you're doing your modelling, what range of conditions do you incorporate? And would they be sufficiently broad in range to accommodate some of the variations that were brought up by the intervenor?

MR. SNOPEK: Dave Snopek, for the record.

We do dispersion modelling at both our Toronto and Peterborough facilities as part of our MOECP -- Ministry of Environment, Conservation and Parks -- environmental compliance approval. We do that dispersion modelling for uranium and beryllium. And it's done in accordance with the air mod methodology that's outlined by the MOE and under our environmental compliance approval. So it uses the data set that is kind of prescribed for that purpose. It includes the meteorology for the area that should be used for that sort of modelling, and that's what we use.

MEMBER MCKINNON: Okay. So how does that account for certain historical record or departures from that that, you know, might cover a greater range at all?

DR. MILLOY: Doug Chambers will take that question.

MR. CHAMBERS: Doug Chambers, for the record.

I apologize. I can't quite see you.

The meteorological data sets, the defaults one are prepared by the Ontario Ministry of Environment. I don't think they're here today.

And because the meteorology changes from location to location, they prepare them for different portions of the province.

For example, if you were using a standard air mod model in northwestern Ontario, you would have a different data set.

So basically, routine analyses you obtain the meteorological data set which does look at -- it's like the climate. Normal almost, it's based on averages over time, but it does reflect wind speed and wind direction and atmospheric stability, which are the major factors.

And Emily would have to speak to it, but I

believe they update those periodically. If you're doing a special analysis, then you can develop a very specific data set for particular analysis.

But in answer to your question, yes, all the factors you mentioned are taken account of in developing and applying the meteorological data set for modelling at a specific location.

MEMBER MCKINNON: Thank you very much.

THE PRESIDENT: Dr. Demeter.

MEMBER DEMETER: Thank you for your intervention. Very interest.

I understand your recommendation that the company puts whatever they're doing -- look at it through a climate change lens from a policy point of view.

Given that, though, are you concerned or aware of anything specific that they're doing that doesn't fit best practice with regards to climate change models?

DR. MILLOY: So with that, I've got a two-part answer.

Number one, I believe the application for an extended 10-year licence is not within best practices in terms of being responsive to a changing climate.

And the second part of it, I would just --

my primary issue is I'm not -- I don't think any of us have been properly or substantially informed enough about how these --BWXT's operations in Peterborough are going to be conducted with climate risks in mind to accurately make a distinction on that because, you know, in reviewing the ERA, in reviewing the submissions, it's just very, very scarce or almost non-existent in terms of what is being in place.

So a lot of the standards that are in there and are very exhaustively documented are kind of what we've already established as what practices should be, right, and how we have done things up until now. But what my concern is, things have changed and we are operating in a different context than we were in 1980 or 1990 or even 2005.

So while I understand to some extent within the ability of my limited knowledge how what is being proposed meets, you know, the way we have traditionally done things, the central argument of my intervention is that there needs to be kind of an extra or not even extra, just an awareness of a changing context and thus, for safety and for community safety and for safe operations, a robust and deep understanding of how they are

planning to adapt to a changing climate and the risks it presents.

MEMBER DEMETER: Okay. Thank you very much.

THE PRESIDENT: So on that note, which is your recommendation number 2, that BWXT provide a detailed explanation on how climate change or adaptive management have been addressed in your environment risk assessment, can you comment on that, please?

MR. CHAMBERS: Doug Chambers, for the record.

I'm going to comment on a more general situation.

We've had several discussions about Canadian Standards Association. Since the mid-1970s, they've had an environmental set of standards and a variety of people participate in developing the standards, including the Canadian Nuclear Safety Commission and its predecessor, the Ontario Minister of Environment, the federal Ministry of Environment, Fisheries and Oceans and basically a whole cast of characters.

And the Canadian standards are reviewed on a periodic basis, and I've been privileged to be involved

in that, so they basically don't go more than about five years before they're reviewed by a whole bunch of people with different perspectives, including those who are very concerned directly with climate change.

So yes, the standards that we used are the current ones, but they're quite recent. They're within the last few years, and these standards are always being updated as new information becomes available.

So I'll let BWXT talk about their specific project, but I thought it was important, for the record, that everyone realized the standards aren't stationary, they're reviewed by a wide group of people with different perspectives, including those who are concerned very much, which should be everybody, of course, with the impacts of climate change.

Thank you.

MR. SNOPEK: Dave Snopek, for the record.

And maybe I'd just add, you know, we saw in particular in Peterborough in 2004 -- we saw a flood that was 100 years flood for 24 hours. We saw it in about an hour. It was a massive rain event.

There was no significant impact to the facility, but as a result of that, in terms of adaptive

management, we looked at that event and looked at how we can improve. And we put in place several measures, the most significant of which was berming the area around where we do our pellet work, where we insert the pellets into the tubes where we're handling loose pellets. And that berm was -- one of the purposes of that berm was to exclude flood water.

If we had a similar event or perhaps even event that was worse, now we've got a berm around that part of the facility that would exclude the water from running into it.

More recently, we saw a very significant rain event in Toronto in the summer of 2018, and we managed through that event, but we realized -- as we do with every event, we look at what happened, we look at how we can respond better and we made changes there in our ability to contain more water even if there was a larger event, that we would be able to handle a larger amount of water in future should that come up.

So we're always looking at those events and learning from those events and making improvements based on what we've learned.

THE PRESIDENT: So the intervenor shared

with us this graph on slide number 10 on heavy precipitation days and what's been forecast, what may be expected for Peterborough.

Was your analysis for your environmental risk assessment, did it look at data like this and see how you can be more proactive in addressing what may unfold in the future?

MR. SNOPEK: I think -- Dave Snopek, for the record.

I think largely we looked at the rain events that we have had and, like I said, we have had a couple of very significant rain events, much bigger than, in the case of Peterborough, the one in 100 year return frequency, and we would not have an issue should that happen again.

And as a matter of fact, in 2004 when it happened, we had a small amount of water run through the facility. That water was not contaminated, so we rode through that event okay at the time, but we -- there's a significant improvement with the introduction of the berm since that time.

THE PRESIDENT: So as I look at this graph, whatever may have happened in 2004, what's happening

in the future is a whole lot worse than that.

MR. JAMMAL: Madam Velshi, it's Ramzi Jammal, for the record.

I'm not going to bail out the licensee. They have to look after themselves, but I would like to put in perspective what we do from a regulatory process, and we fully agree with the intervenor that climate change did take effect.

So we take a lot of lessons learned from many events. It doesn't matter if it's the Fukushima event itself, which we requested a review of the safety analysis of that facility.

And it's an ongoing process with respect to determination, so if we can get connection back to Ottawa, we will provide you with more detail.

But the safety analysis is reviewed based on the information we get for events that occurred.

I'll start with the fact that the Canada and CNSC was the -- one of the very first regulators to require uranium mining and processing facilities to look at their safety analysis based on the lessons learned already from Fukushima.

With respect to the floods, we know

there's no criticality issue, but -- with respect to the floods.

I will pass it on to either Andrew, Mr. McAllister, in order to give you the details associated with the safety analysis, but the safety analysis is reviewed on a periodic basis taking into account many of the elements and lessons learned associated with our regulatory oversight.

Andrew?

MR. McALLISTER: I'll say a couple remarks and I see Ottawa there, so they can complement my answer.

And I noted the intervenor's concern about being able to respond quickly, so I just want to give assurances that you heard about some of the standards we look at being updated on a regular basis. You heard Mr. Jammal say that the safety analysis gets updated on a regular basis.

And when it gets updated, it's also looking at what's the new science telling us. You know, is that an appropriate external event to look at with what impacts it may have on your facility?

Likewise, the environmental risk assessments get updated on that five-year basis.

So there was concerns expressed by the intervenor about it only looked at meteorological data to a certain timeframe. The next one will have that additional data, meteorological data, have additional environmental monitoring data, and it will help inform do we need to make any changes to the effluent monitoring, to the environmental monitoring.

If the science changes around other aspects, that's another expectation, that the science gets updated in the environmental risk assessment.

So I just wanted to be clear that the way our framework is set up, we are able to -- we are agile, we are able to respond quickly to changes through the sort of periodic updates on key safety features.

And so with that, I'll pass it back to Ottawa if they have anything else to add.

MR. LEI: For the record, my name is Shizhong Lei.

Sorry, we have probably missed about 10 minutes of webcasting, so we didn't know what was already discussed. But the intervenor was correct to say that mitigation, adaptation is an important part when we deal with climate change.

However, the first part, in order to be adaptive, in order to mitigate any effects of the climate change, we first have to know what's the effect of climate change and specifically, for example, the frequency of extreme flood and the magnitude of extreme precipitation. And those are very complex issues.

What's -- the Intergovernmental Panel on Climate Change, we published the report based on hundreds of experts around the world, but mostly focused on the global scale change of temperature. How to translate the change of temperature into the change of, for example, extreme flooding, that takes lots of effort.

And CNSC Staff is always keeping abreast of the development in the climate change science.

We also work in collaboration with national and international organizations, for example, and CNSC Staff is participating in Environment Canada and Climate Change's strategic assessment of climate change.

We are also participating in nuclear energy agencies working group on external hazards.

And in our -- in the working group, for example, the climate change is a very important topic of our attention. And we -- internationally, we not only look

at the extreme events, for example, the flooding, we also look at the combination effects, how different external hazards, if they happen at the same time or if they have a causal relationship. And all those studies and researches are still doing.

CNSC also conduct on our own research. For example, through CNSC's research and support program we're currently conducting a study on how climate change is impact the magnitude of extreme precipitation, especially in Canada, especially around places where there is current and the potential future nuclear operations.

And in addition to what my colleagues mentioned earlier, for example, risk assessment and safety analysis are updated regularly and -- every five years, and any changes that's observed would be reflected in those updates.

And the CNSC's licensing process also ensure that licensees have contingency plan in case something, for example, a flood which is bigger than the protection capacity, happens.

THE PRESIDENT: Thank you

MR. LEI: So we ensure that's -- the safety and the environment is still protected.

THE PRESIDENT: Thank you.

Dr. Berube.

MEMBER BERUBE: Well, I'd like to thank you for coming. This is a topic of personal interest to me, and I'm pretty aware of the limitations of the way we're dealing with it, of course. And you deal with that every day, of course.

I'd also like to, on the basis of what you told us about the sisters and their work, to congratulate them on that. It's a tremendous and very important endeavour and undertaking that they're doing, and that's something that we need.

So thank you for that.

You've asserted that basically there's a -- there's a number of things that are missing, you know, here in terms of climate change adaptation in terms of the application you've seen and also the materials that are produced by CNSC.

Could you just give us a couple examples, specific examples of what you think is missing from this application?

DR. MILLOY: Thank you.

One specific example, staff -- the last

staff member who spoke I think gave a very good explanation of how complex the reality of a changing climate is and how many factors, and just -- I used the phrase known unknowns before because, you know, you change one variable and we can have a different outcome which is, again, earlier why I suggested that that 10-year is inappropriate because, you know, things are going to change rapidly.

So with that in mind, when Mr. McAllister spoke earlier, you know, it's heartening to hear that the data will be updated for 2020, but something that I don't see, for example -- also, Mr. Snopek about, you know, lessons learned from previous flooding events, which is super important.

One of the things I don't see is -- in terms of this data will be changed. This data is observational data, which is important, but one question I have is, is there modelling being done internally by BWXT by saying, okay, well, with this certain amount of warming or with these amount of effects, with this amount of extreme weather because there are several possible scenarios on the table climate-wise.

And I would be -- I would hope that there are contingency plans and ways of adaptively managing

operations in a changing climate that are not just reactive, but proactive in the sense that plans are being made for various different climate scenarios of the kind that staff just spoke to, and the possible different effects or tipping or cascading effects which will produce different climate outcomes.

So I would like to see not to be reactive, but there's also kind of a proactive element. And that's something I didn't see in the materials.

Thank you.

MEMBER BERUBE: So CNSC Staff, let me ask you this question.

Given the high level of ambiguity in climate change and especially in modelling, we know that basically that's an ongoing effort and these things are dynamic and evolving, and also knowing that the regulatory environment and the legal argument tend to be reactive, not proactive, how do you take into account a lot of uncertainty with regard to climate change when you're reviewing an application in terms of, you know, what's there and what you think might need to be there given what you know?

MS TADROS: Haidy Tadros, for the record.

So I'll pass this back to Mr. Andrew McAllister to give you a feel for how the review is done when we look at the ERA and then perhaps Mr. Julian Amalraj can speak to the safety analysis report.

But you've heard CNSC Staff say, based on this program and other programs, that we use kind of a conservative approach. We use -- we look at information as though it was a credible worst-case scenario that we look at.

And it would be no different when you look at external hazards as well.

But I'll let Mr. McAllister and Mr. Amalraj explain what is done in this particular case.

MR. McALLISTER: Andrew McAllister, Director in the Environmental Risk Assessment Division.

So I'll start the answer and my colleagues can complement things.

I think we're -- you know, when we look at the terms of timeframes as well, I think it's always an important thing to examine when looking at climate change and looking at a facility, one might look at a facility such as this in a slightly different manner than you would look at, say, a mining project that's going to be going on

and be ultimately decommissioned and remediated.

When looking at longer-term predictions where the realities of climate change are more likely to be felt, we do look at how are the longer-term impacts modelled, what are the conservatisms that they have in the model to really account for those uncertainties associated with climate change.

When we back up the timeframe that we're looking at, there still is conservatism in nature in some of the modelling -- the modelling that's being done, but the time scales for that modelling is obviously shorter and, through use of the safety analysis that we mentioned where the science gets updated with respect to external events and those aspects, provide a useful means to look at these -- to look at these hazards with consideration of climate change and those sorts of conservatisms when looking at those analyses.

And if other colleagues have other things to add, I'll pass it on to them.

MR. AMALRAJ: Julian Amalraj, for the record.

I'll try to address the part about the combination effects or extreme events.

While the frequencies are extremely low, in terms of the focus from a safety analysis side is the design and the barriers built in terms of facilities. One of the points that the licensee mentioned about the 2018 power outage was reported event, and CNSC Staff did review that.

In that particular case, there was significant water that was ingressed into the facility, but nothing left the facility. And the licensee still had significant capacity if there were any other events or anything that happened in putting fire water or any other event.

So it is not like a one particular event, even though it was an extreme event that happened, it did stretch the resources, but it's not something that it breaks. So that is a point that I do want to make.

And the licensee does have the capacity to handle additional any events on top of events, so it is something that we review, we review on an ongoing basis.

There's a five-year review period for the safety analysis report itself, and we do require the licensees to make corresponding adjustments. And based on any event that happens, we expect the licensee to do

corrective actions, lessons learned associated with the OpEx of that event and take corrective measure immediately going forward. And CNSC Staff review that very closely.

And the 2018 event was a good example of that in that yes, there -- the system was stretched, but it did not end up in a situation where there was a break. And they did have capacity to additionally deal with any other events if it had happened in a situation.

THE PRESIDENT: Okay. Well, thank you.
Thank you for your intervention.

DR. MILLOY: Sorry. If I may just follow up just briefly.

THE PRESIDENT: Okay.

DR. MILLOY: Sorry. I have one question just to follow up with Mr. Berube's question -- Dr. Berube's question.

So that was just one of the specific things that were unanswered. Just quickly, most of the extreme weather events that we have discussed here today have been floods, which is obviously important, but you know, you asked if there were other specific things not mentioned.

And one of the things I want to mention

was the possibility of increased frequency or severity of ice storms, greater possibility of transport accidents, which happens in conditions of extreme heat or extreme temperature changes, and also the possibility of an inability to procure necessary materials for safe operations because of climate impacts perhaps somewhere else in the country or overseas.

Those would be my final kind of climate related events that I don't feel have been specifically addressed so far that I would love to hear a bit more about.

Thank you very much for the generous time that you have shared with us.

THE PRESIDENT: Thank you.

Our next presentation is by Ms Angel Hamilton, as outlined in CMD 20-H2.85.

Ms Hamilton, the floor is yours.

CMD 20-H2.85

Oral presentation by Angel Hamilton

MS HAMILTON: Hello, good afternoon.

Thank you for having me.

I'm a Peterborough resident for 40 years. I live in the neighbourhood of BWXT. My best friend for my entire life, her daughter Sepheria, who is 12 years old, goes to Prince of Wales. So that's how I found out about this topic.

First of all, I would like to say that my concern for the health of children and vulnerable populations in Peterborough isn't just about my relationship with my best friend's daughter, it's also about the fact that I went to Trent University and took medical anthropology with Dr. Anne Keenleyside, who is an amazing forensic anthropologist. And she was the one who first enlightened me in 2008 in regard to cancer causing contaminants and endocrine disruptors in regard to how it affects human health. And I went on to study that during my Honours while I was attending Trent.

And I went to Vancouver and became an independent documentary filmmaker. And particularly Rob Viscardis is one of my colleagues. He's a bit of a geographer and editor pertaining to two of my feature films that I've produced that have been at ReFrame Film Festival.

So particularly the topic of GE has been of interest to me, particularly since he started that film

because we had a meeting to discuss some of the research surrounding the documentary.

The thing is is that I also work at a health food store. I work there fulltime in supplements, so I've got a lot of training from a lot of different naturopathic doctors and what have you; not formally, though, just more in like a casual manner.

I've always been really reluctant to speak to the matter of GE and contaminants given that most of my uncles, as well as my friends and dads, have worked for GE for a very long time. So I kind of put a blind eye to BWXT considering that my employer has -- like my manager who's in charge of my job, their husband works for BWXT. So does my cousin and family.

So it was really hard for me to come here, given that conflict. But I believe the lack of transparency and discussion with the public of Peterborough and the Kawarthas has been very, very low to the point of well nothing. I'm just appalled.

The exposure when it comes to beryllium and when it comes to particularly uranium is deeply concerning to me. I know that there is a value of world views here. There's 400 jobs. People are hungry for jobs.

So there's value of economy and value of the Canadian economy. I understand that. But at the expense of human health, especially over long period of time.

And that's what I came to know when I was at school at Trent, is that you look at how the different kinds of toxic contaminants affect the body over a long period of time and exposure.

In my opinion the recommendation is to not only not give BWXT the licence for uranium pelleting but also to actually in my personal opinion that any miniscule amount of uranium oxide and powder, as well as beryllium, is unacceptable risk and is not precautionary principle and is unethical, deplorable, unacceptable for especially small children.

When it comes to -- one of my friends, Lillian, who is three years old, four years old, who just moved to Peterborough about a year ago, who's at Prince of Wales, her dad is actually my sound engineer for three of my feature documentary projects. They moved here from Toronto. Of course he's very upset about this because her future in regards to potential of having children, potential -- and these are all things that are discussed in different peer review journals and what have you.

But there isn't a lot of science in regards to small children precisely because we haven't actually had the time, as medical anthropologists, to look at the longitudinal studies of the impact, of the health impact, on small children.

And of course I'm concerned about the water because it's one thing in Toronto to have the kind of beryllium and uranium in the Great Lakes but considering I come from the Kawarthas, I come from Omemee, I come from Norwood, Atwaker(ph) Farm and Mallard Bay, I know first-hand that the aquifers and the situation with the ecosystem is quite delicate and quite small.

Little Lake has already been contaminated by GE for a very long time. I see that watershed in jeopardy, given this licence for uranium pelleting.

I would further add that we must exercise caution with these emissions. It is so dangerous, given if there is any kind of tornado. And I've lived through two tornadoes in Omemee when I was growing up and in Bridgenorth. It completely destroyed the town.

So those kinds of things do come to mind.

I am worried about the water, the drinking water. I think any particulate both in air, soil and water

is completely unacceptable. It doesn't matter how small, it is not good for human health, in my personal opinion.

I furthermore think that hazardous nuclear chemicals has no place beside a school with small children and with mothers that have foetuses, unborn foetuses within their bellies, and the potential for the airborne uranium dust is extremely dangerous in a residential neighbourhood for all of the elders that live in the neighbourhood as well, that already have susceptibility to different kinds of cardiovascular and diabetes, are already have vulnerable health outcomes for poverty and impoverished town like Peterborough which for way too long has had high levels of cancer.

I worked in the hospital for five years as a housekeeper and witnessed first-hand the kind of suffering that can happen from the kind of heavy metal toxics that you just can't take out with a good diet and supplements.

It's really, I think, important for everyone to understand that throughout the world there's been lots of different situations whereby -- what comes to mind is in the -- actually I want to mention that I was really quite upset to find out the BWXT hid something. I

felt lied to. I felt it was not transparent of them to talk about the situation with Pike County, Ohio, given that they're implicated in a lawsuit in regards to a school. I forget the name of the school at the moment, but I found it on Google and I couldn't believe my eyes when I read about that and that BWXT was part of that and they never spoke about it in Peterborough and the Kawarthas.

The children actually were taken out of the school. The school is still closed. It's still in the courts yet to be decided whether uranium dust from the pelleting from BWXT was in fact part of that situation unfolding there.

So I still have questions about that. I would like to know: Were there any children's health affected? From my understanding of reading the document that there has been accusations that thyroid cancer did impact some of the children in that school.

I'm very interested to find out more in regards to how does BWXT have a plan in place when it comes to dealing with compensation for occupational diseases for the workers, for fulltime workers, especially women, especially women who are dealing with infertility and dealing with endocrine disruptors and dealing with

different kinds of contaminants that we don't really know fully how it affects the hormones? How does it affect the brain, cognition, the focus, the concentration, the assimilation of memories and the ability to have a life, a quality of life?

I would really like to know about how the diminished life chances and health outcomes of that risk, how would they compensate for that, because certainly when you have a population like Peterborough, especially with GE leaving, not having access, equitable access and distribution of resources when it comes to nutrition, when it comes to the kind of -- already their health is impacted with the stress of this, and I think it's just going to further exacerbate their health outcomes.

So I'll just leave it at that. I have 11 seconds.

So thank you for your time.

THE PRESIDENT: Thank you.

Thank you for your intervention.

Dr. McKinnon.

MEMBER MCKINNON: Yes, thank you for your comments.

I would like to address your concern about

the contaminants reaching the water system around the area. You mention in your intervention the Ontonabee River and Little Lake.

So I wonder if CNSC staff -- there are some measurements of the uranium to water emissions and beryllium to water emissions more locally. Could the staff comment on the concentrations that may reach these waterbodies which are mentioned, such as Little Lake, but to put it in perhaps the context of how it might compare to background levels, just as a comparison?

MS TADROS: Haidy Tadros, for the record.

I will pass this to our environmental protection specialists who have looked at that information.

MR. McALLISTER: Andrew McAllister, Director, Environmental Risk Assessment Division.

So the information I can provide was also provided in BWXT's environmental risk assessment for the consolidated operation. So for people who have an interest, they are able to find that. It is posted online.

What was looked at was that they looked at the consolidated operations with respect to their effluent discharge to the sewer and then looked at what the estimated concentration would be in the receiving

waterbody.

For uranium using the drinking water maximum acceptable concentrations for drinking water of 0.02 milligrams per litre as a comparative point, the estimation was 0.0002 milligrams per litre.

Similarly with respect to beryllium, beryllium will remain unchanged as a result of the potential consolidation of operation. They have a couple of screening criteria of 4 micrograms per litre and 12 micrograms per litre. The estimated effluents from the wastewater is 0.0004 micrograms per litre.

So the way an environmental risk assessment works is you look at potential releases and you compare those to sort of screening criteria. If it's meeting those criteria then you don't undertake further analysis. Those screening criteria are meant to be protective of human health and the environment.

So based on those findings we're not seeing an impact from this operation on the health of the Ontonabee River or Little Lake.

In addition, I will turn to my colleagues here.

I made mention of it, I believe, yesterday

or the day before but there is provincial water quality monitoring that does happen in those associated watercourses.

I will pass it to my colleague who can provide a bit more detail on that.

MS SAUVE: Kiza Sauvé, for the record.

This information is also in the environmental risk assessment which is available.

So based on the data from the provincial water quality monitoring network -- and there's also the Ontonabee Region Conservation Authority that also does monitoring in the area.

The maximum concentration for uranium -- and this was in a waterbody within a kilometre of the facility -- was 3.63 micrograms per litre, and I would compare that to the Water Quality Guideline for Protection of Aquatic Life of 15 micrograms per litre.

For beryllium the maximum concentration was 0.104 micrograms per litre and the comparison there would be the U.S. EPA drinking water regulation of 4 micrograms per litre.

And the Protection of Aquatic Life Guideline for beryllium is 11 micrograms per litre.

We also did sample water in the IEMP. That was done in the Ontonabee River, and our results for uranium was .34 micrograms per litre, so much lower than any of the screening criteria.

MEMBER MCKINNON: I didn't keep in my mind the estimated versus the measured. Were they comparable, the numbers that you just mentioned?

MR. McALLISTER: I'm going by what Ms Sauv e just said. From what I could tell, the numbers estimated here would be lower than what Ms Sauv e reported as receiving environment numbers from the provincial water quality monitoring network and the IEMP.

MEMBER MCKINNON: Thank you.

THE PRESIDENT: Dr. Berube?

Dr. Demeter, sorry.

MEMBER DEMETER: Thank you.

Thank you for your intervention. I'm going to take what you said and drill down on one of your concerns.

If staff slide from their presentation, slide 30, could be put up, I think this is a good time to manage a question I have about this.

I'll wait until it comes up.

There you go.

When I first looked at this, understanding the background range and the guideline and the human health, with the exception of site 3, all other sites show a trend over those three data points for which I have a bit of confusion as to why it went from 2014 to 2018 and 2019. The sequence doesn't quite make sense.

And visually it looked like a trend, knowing that they have some uncertainty, which I suspect is one standard deviation. I'm not sure was the plus/minus 40 sits in.

So to me it all looks like a trend and we could do the regression analysis and decide whether it's significant or not. But visually it's a trend and by the data table it's a trend.

I haven't heard an explanation yet that can account for this trend, because you've said that the emissions don't correlate to the trend or the increasing levels. If it's a natural background, it should be in the form of steady state or equilibrium, unless you have some geohydrological phenomena that's causing it to change. And I haven't heard that.

I'm concerned that the level for No. 5 in

2019 is approaching background levels. And this is at the school, I think, this one.

I'm a bit cautioned by previous historical events with other metals in soil relative to paediatric health. What we've learned through time with some of those other examples, such as lead, is that the safety level as we learn more and more about effects on infants goes down.

So I still need an explanation as to why this trend is there, real or perceived, and what we're going to do if it continues. It begs the question as to whether we're actually capturing all the emissions or there's some fugitive emissions we're missing that's going into the soil. Or is there some other phenomena?

Until I think we get an answer as to why this trend is there, it leads to work that needs to be done to understand it.

This probably will take both BWXT and CNSC to answer. I'm not sure who wants to go first.

MS TADROS: Haidy Tadros, for the record.

I would ask that we go first because these are IEMP results that we have in our program determined.

So I would ask Ms Kiza Sauv e to speak to the IEMP results that are there and to also speak to what

CNSC staff have done once we have realized that these numbers exist in the current environment.

MR. RINKER: So it's Mike Rinker. I'm the Director General responsible for Environmental and Radiation Protection at the CNSC.

I think the observation is an important one and we will hear it some more in some interventions, and the CNSC takes it quite seriously.

There are some cautions to calling it a trend that I want to emphasize.

First of all, the data is from the CNSC's Independent Environmental Monitoring Program. This is a fairly new program and we've refined our techniques over the previous five or six years.

The uncertainty that is presented in the slide going from 40 percent down to 5 percent -- I think it's down to 5 percent -- represents a change in methodologies that are conducted at our lab. So we've refined our ability to analyze uranium in a more precise way because we do inter-lab comparisons and we are on a continual learning exercise.

Also, the manner in which we've collected samples in the past is different than they are today.

I want to make sure it's clear that there are other variables that could account for this that we need to investigate, as well as the possibility that our understanding of what's leaving the facility could be impacting the soil. Or it may not be.

In order to cause an increase of one milligram per kilogram in the soil, you would need to release in the range of kilograms of beryllium up the stack.

So we would need to be wrong from understanding that there's 15 milligrams being released per year to maybe there's 15 kilograms. That's a big difference in order to cause that sort of observation. So we have a lot of caution in terms of: Is the data showing significantly difference in the two data points or is there a significant difference in terms of what the beryllium is in the soil at the school?

Those are very different questions.

Yes, you can do the stats and come up with a statistical analysis that two data points are different from each other, but we do have the appropriate data to say: Is the soil concentration at the school different than what it was five years ago?

These are two very different statistical tests.

So the results of the IEMP are not as powerful as the data that we get from the licensees. And we take any signal that we get that would be unexpected as a need to follow up and investigate. And that's what we are planning to do. We will be going back looking more seriously, particularly at the school, because it matters to us and it matters to members of the public that we want children to be unconditionally, 100 percent certain protective.

And in order to build the trust, we want to do this in a very public way. We will be announcing when we're coming back to Peterborough in the summer. We would be happy to get participants from the community to come and join us, learn what it means for soil sampling and why we're doing it and how we're doing that.

I think over the next couple of days what we're looking for is how do the citizens of Peterborough want to be engaged in this process? We understand different communities want to be engaged in different ways, and we heard in Toronto knocking on the door and leaving pamphlets in mailboxes was effective. I'd like to hear, in

Peterborough what's the effective way of doing that.

So there's so main points that I want to make, is, that we've picked up an observation that everyone else has seen. It's still within the range of background, so that means that every school in Ontario has values that are similar.

We have a very conservative way of analysing all constituents in soil. We look at total digestion, which is going to be a higher number than what the province would look at, which is a partial bioavailability digestion. So, when we say it's within Ontario ranges, our numbers will always be higher than what the province measures because we do a different analytical technique.

And, nevertheless, we will follow up and investigate.

MEMBER DEMETER: Is there some -- given the samples, the one that's the highest and the one that's in the school, is there some merit to increasing the sample frequency at that site, and also the number of -- I suspect, to be consistent, you re-sample the exact same place every time to make sure you're -- but can you spread the sampling out maybe to make it a five-sample slot versus

a one-sample? I'm not sure how many samples, if this is an average number or if this is a single sample. But frequency and number of samples, I think are -- could they be enhanced to hone in whether or not there's a trend?

MS SAUVÉ: Kiza Sauvé, for the record.

So I want to continue. I'm going to add one layer -- and then I'll answer your question -- is, we are all air sampling when we do our soil sampling, and so our air sampling results are coming back undetectable, at the time.

But we also know that soil is -- you know, the air goes into the soil, and that's where it can accumulate.

So in terms of answering frequency, we wouldn't expect to see much variation over the -- from one year to the next, in soil. Obviously we did from 2018 to 2019 which is why we are going to go back in 2020 to do some more confirmation sampling.

The way that we do do our sampling for -- when you see one sampling spot, it's actually like a -- we take -- if you picture a dice and a number 5 on a dice, we actually take five and composite those together.

What we're looking at possibly doing at

the school this year would, say, do a 5 dice pattern in the schoolyard on each of those sites take five and composite you know each one, so we might have five. We are taking core samples so we're also aware of not wanting to do too much aeration of their - their yard.

BWXT has committed to sampling at the same time, so also doing their own sampling and possibly continuing sampling; those are discussions.

What's also interesting about this one is this is one of the -- a location where the IEMP is in place even though, based on the emissions under any of the guidelines there is no requirement for the licensee to do environmental monitoring, and yet we're doing IEMPs, so it's one of those ones where we don't have the licensee's results to compare to, whereas, normally, at other facilities there might be some licensee results. So we look forward to having that: two sets of people sampling, this summer.

THE PRESIDENT: Let me follow up on a few of the points that you had made. One, is just around the timing of your results being made public. And it was a bit too late for intervenors to really react to it, or when they had information sessions to get an understanding of

what those numbers meant.

Did you give any consideration as to, 'Hey, there's a licensing hearing coming up, let's make sure all the information that the public or intervenors would need is available to them early enough for them to understand what's happening in the environment, and they can react accordingly,' because this did come out rather late and took many by surprise?

MS SAUVÉ: Kiza Sauvé, for the record.

So when we were planning our sampling we were looking at the 2018 results being used for the 2020 licence renewal. It so happened in our planning period it seemed that it would be best to go back to Peterborough and Toronto in 2019, but it was really the 2018 that we were looking at having those results available for the 2020.

When we saw that we had results in time, because it generally does take a couple of months at the lab and then a time for us to have to review the results, and we saw that we did have results ready we actually rushed the process to get those available and online. So we were counting on the 2018 results for the licence renewal; that's generally how our planning goes.

THE PRESIDENT: So hopefully from this

we've learned to -- the CNSC staff have learned things, like be prepared for the unexpected and then make sure there's adequate time for people to understand.

My second point is around, you said you are planning on coming out in the summer and then it takes a few months to do the analysis and confirmation and so on. So the next set of results won't be available till much later in the year, is that correct?

MS SAUVÉ: Kiza Sauvé, for the record.

We like to come around the same time period each year, and I believe it was June that we were here, definitely, when school was in session last year. So we would look to come back during that time. And we would be rushing these results to ensure they are ready for the regulatory oversight report in December.

It likely won't make it into the draft report that goes out for public review, but we will do our best to get them online you know a good time before we come in front of you.

THE PRESIDENT: So what's so critical about doing it at the same time of the -- like, why not go out next month?

MS SAUVÉ: Kiza Sauvé, for the record.

For a lot of the sampling we like to go at the same time of the year, for air and water.

THE PRESIDENT: I meant for this particular one?

MS SAUVÉ: Yes. Okay, so for this particular one we're looking at ground; would the ground still be frozen. We can look at when we can go. But we could look at going earlier if --

THE PRESIDENT: I mean we're here over the next few days. But given what I have read in the interventions the level of angst that exists around this, should we not try to provide reassurance, if that is indeed possible, earlier?

MR. RINKER: Mike Rinker, for the record. So I think that we could look at soil conditions and maximize getting it as early as possible without further confounding the issue by sampling mud or something that --

THE PRESIDENT: I hear you on that. And then besides the CNSC, who -- does the province measure for beryllium? I mean is there a general increase in trend elsewhere?

MR. RINKER: Mike Rinker, for the record.

The province will be joining us tomorrow and we could ask them. But they -- I guess what they do is they publish documentation in terms of what are the typical ranges of many constituents across the province and that's in a published document that they provide, as well.

THE PRESIDENT: Okay, thank you. Dr. Berube?

MEMBER BERUBE: Just a question with regard to that table on beryllium results. Obviously, it's IEMP results over three years, but it's my understanding that you've utilized different testing protocols for each one of those samples. So I don't doubt that the validity of the actual testing that was done that -- each one of those years -- but I do have some concern about the validity of comparing each one of those results knowing that they are different testing protocols.

So when you look at it statistically, it looks like there's a considerable variance happening, but because the testing protocols have changed and the accuracy of the test has changed, I'm not sure if you're comparing apples to apples here, is what I'm trying to say.

That being said, I don't like trends that are drifting up. So all the rest of the arguments that the

Commissioners have had -- other Commissioners have had or -- I completely concur with that. But maybe you can speak quickly too, to that?

I applaud the fact that you're trying to get better testing protocols in place, a continuous improvement. But, putting up a chart where there may be a lot of ambiguity in this and -- it becomes problematic.

MR. RINKER: Mike Rinker, for the record.

And thank you for the question. That is exactly the caution that we want to put in place, that do the variances amongst the years reflect improvements at the lab and improvements in sampling, or does it mean something else? And we certainly warrant -- think that that warrants an investigation, and we will be going out to take more sampling to answer that question.

In terms of the techniques, the CNSC is -- is of two minds. There's something called the total digestion where you digest in the soil silicates, anything, and that's important for inter-lab comparisons, it's important for safeguards. But what we find in this time, it becomes a bit of an abstract when comparing it to what the province would look like, because from a health perspective it's the extractible, the digestible component

that matters. So our numbers will always be higher if we go with the total.

But, on the other hand, it's the very conservative approach. And we encountered this problem when we were in -- doing an investigation together with the province around the BWXT facility in Toronto, I believe in 2012. We went out and we did a soil survey together with the province, did split samples. They took it to their lab; we took it to our lab. And in the grouping of data, our samples were marginally higher than all of the samples from the province and so when we looked at it we realized we did total digestion; they did a different technique in the lab, and it made sense to explain it.

And so these are factors that we have to take into account to ensure consistency not just looking back over the last few years, but we intend to be monitoring, doing IEMP for the next several decades. So we want to set it correct now and in forward-looking. And so those are the questions that we intend to start answering soon.

THE PRESIDENT: Dr. Lacroix?

MEMBER LACROIX: May I slightly change the subject?

THE PRESIDENT: Of course.

MEMBER LACROIX: Madam Hamilton, you've mentioned something during your presentation and you've also read in, in your submissions, something that really touched me when you mentioned that this whole issue of licence renewal is divisive in the local community. I have been in this situation before in other circumstances and it usually leaves scars behind. So no matter what decision that this Commission will reach, I hope that the community will come together and appreciate the work that we're trying to do here.

Further on in your submission, written submission, you mentioned that BWXT does not have a social licence nor a community consent. And I would like to hear from BWXT, what are you planning to do in order to mitigate the effects on the -- the divisive effect on the community in the long run?

MR. MacQUARRIE: Its John MacQuarrie.

So, we're certainly concerned very much about that. Yeah, it's certainly difficult for the community members. It's very difficult for us and our employees who are community members, as well. And so you know our goal is, as I've mentioned previously in the last

couple of days, is to significantly improve how we communicate to the community members and I've provided a lot of detail, so I won't go through that again.

But, I think by being able to -- to communicate in a better way, I think will help to heal some of those things that we're seeing. We're starting a community liaison committee here which we did not have in place and -- and there's a number of other things that we have planned to implement. So hopefully that will be the best measure we can take by being transparent and sharing all that information we can find that the community is as comfortable with our business as our employees are.

Thank you.

THE PRESIDENT: Ms Hamilton, there are many other issues that you have raised. Over the next few days -- and many other intervenors have raised those -- we will be addressing those. So, I do thank you for your intervention. Thank you.

MS HAMILTON: Thank you for having me.

THE PRESIDENT: Our next presentation is by Ms Sue MacKay.

MS MacKAY: It's MacKay.

THE PRESIDENT: Ms MacKay, as outlined in

CMD 20-H2.116. Ms MacKay, the floor is yours.

CMD 20-H2.116

Oral presentation by Sue MacKay

MS MacKAY: Thank you. Some of my issues have been partially addressed but I will read through, just because I'll get lost if I don't.

Transportation: One of my concerns was the transportation of nuclear materials in and out of Peterborough.

In CNSC's response to the concerns they assured us that material is transported in a safe manner according to the packaging and transport of nuclear substances regulations which are based on the international *IAEA Regulations*. Plus, persons with an approved emergency response assistant plan will use the plan to assist emergency responders.

I am certain that you take good care in this regard, yet, from 2010 to 2013 more than one in seven trucks carrying Class 7 dangerous nuclear goods have been pulled off the road by the Ontario Ministry of Transportation for failing safety and other requirements.

Out of 102 trucks inspected, 16 were decommissioned and taken off the road. The failures included lack of load security, faulty brakes, damaged air lines, and drivers with no dangerous goods training.

In other cases, trucks were slapped with exceeding weight limits.

In total, 25 of 102 inspections resulted in nearly one in four vehicles being placed out of service or enforcement taken against the operators.

You do not have control over transportation or human behaviour.

Hydrogen gas. The dangers of having highly explosive hydrogen gas in close proximity to Prince of Wales School with the potential to do great harm to the children and the environment by scattering uranium powder and beryllium throughout Peterborough.

CNSC's response. They evaluated and concluded that the hydrogen tank would be up to code according to the safety authority. And, further, that appropriate controls have been established to reduce the risk of an explosion to ALARA.

Further to that, CNSC stated that the estimated risks associated with the tanks are similar to

those that would exist in any location, and they agree with BWXT that it is unlikely to happen, yet hydrogen gas leaks easily, it's highly flammable. Hydrogen gas embrittles metal causing metal fatigue and rupture and explosions do happen quite frequently often causing death and extensive damage over areas a kilometer in size.

Having a hydrogen tank in a residential area and 25 meters away from the school is taking unreasonable risk and playing Russian roulette with people's lives.

Next, inhalation of uranium dust. Concern related to the inhalation of uranium dust: Each gram of uranium powder -- this was my response -- contains 3.8 trillion particles and that just one particle inhaled in the lungs can cause life-threatening health problems.

CNSC response to my concern was that this statement was scientifically unfounded in that the number of particles in a gram of uranium depends on the particle size and the dose of inhaling a single particle is one billionth times less than the regulatory public dose limit of one millisievert per year -- I think it's per year -- effectively, zero dose. I don't want your regulatory dose. I don't want any dose beyond background.

My understanding is that you take the total of the toxic burden and divide it by the entire population of the community to come up with a supposedly acceptable limit per person. I would like to have that clarified.

All your number crunching and averages do not give me comfort. The fact is that BWXT will be introducing uranium particles, beryllium dust and radiation into my life that would not ordinarily be there, and inhaling one particle regardless of the size, if it lodges in my lung will emit alpha or beta rays and will continue emitting alpha or beta rays damaging the surrounding tissue that may potentially turn into cancer, and proving that a cancer was related to BWXT emissions would be very difficult to prove.

Beryllium is -- Beryllium at the Prince of Wales School. Beryllium is the most toxic substance known. It is a carcinogen that leads to serious illness, cancer and changes to DNA. It is likely that it passes to infants through breast milk and crosses the placenta. The fine dust particles can stay suspended in the air for up to 10 days and beryllium accumulates in soil and water.

Children are much shorter and can breathe

in the dust from closer to the ground. A child's lower bodyweight and higher intake rate can result in a greater dose of hazardous substance per unit of body weight.

Children play at Prince of Wales School will be kicking this stuff up and breathing it in, not to mention the potential for wound contamination, and we know that kids get all kinds of scrapes and cuts.

There have been increasing levels of beryllium in the soil at Prince of Wales School since 2014 I believe, with the most alarming spike in 2019, from 1.27 to 2.34. These figures are still within limit but worrisome. But even more worrisome is BWXT's response, saying it was inconsistent with the air monitoring at BWXT roof same, stating that, "Emissions from our facility could not account for this apparent increase." Well, where else would it be coming from?

BWXT is the only facility using beryllium in their manufacturing process. So BWXT do something about and quickly; our children's health is at risk.

Next, communication and trust. I do not trust the CNSC or BWXT. CNSC has all the power. CNSC is the safety regulator, sets limits for contaminants that can be released into our air and water using the ALARA

principle as a guide.

ALARA, to me, is a licence to poison and pollute, and using the softer word "release" does not soften the fact that you are dumping toxic waste that you don't know what to do with into our air, water systems and soil.

I believe these hearings are to placate the masses. I do not believe our concerns are being taken into consideration at all. The hearings are window dressing for decisions that have already been made.

Why didn't CNSC consult with Peterborough citizens prior to recommending approval of the BWXT licence to pellet? Because you didn't have to because no one is overseeing you; you hold all the cards. Because BWXT meets all your requirements and check boxes, but your requirements do not require you to consider the health of the people or the planet, except to the bare minimum.

Currently BWXT is dumping massive amounts of pollutants into Toronto's air and water systems and you are proposing to bring it to Peterborough. We do not want your toxic waste, and Toronto doesn't want your toxic waste.

All of CNSC and BWXT communications

written, oral and online are glossy testimonials to your safety record in keeping toxic waste to a minimum and thereby protecting the public. And I truly think you believe it, because you could not stay in the business if you didn't.

BWXT has lied to us from the beginning. I attended their summer barbeque and their October event at the Evinrude Centre. At both events I have questioned BWXT's staff about their open-ended licence request and the intention in regards to pelleting. I was assured that there were no plans to do pelleting in Peterborough; it would not happen.

Not until November meeting with BWXT prior to the tour of their facility did the truth come out that they wanted flexibility to pellet. This is hardly open and transparent communication. I understand now that BWXT wants to consolidate their operations in one facility and CNSC has never denied a licence.

And, finally, the nuclear industry is dirty from beginning to end, from the illness and death of uranium miners to the inability to deal with toxic waste. Nuclear power is a dying industry. More nuclear plants are closing down than opening. Most European countries have

committed to phasing out nuclear power, especially since the Fukushima accident, because of the risk to life and life of the planet is too high. The world is changing and demanding new ways of producing energy. Individual countries are soul-searching and changing the way they do things.

If CNSC grants this licence then CNSC and BWXT will be complicit in the deterioration of life in all its forms, as well as the destruction of the planet.

I ask that CNSC and BWXT search their souls and do the right thing. Deep in your hearts you know what you are doing is wrong. Please do the right thing and deny this licence request.

THE PRESIDENT: Thank you, Ms MacKay.
Dr. Demeter?

MEMBER DEMETER: Thank you for your intervention. It raises a lot of issues and I'm sure through the course of the next few days each of those issues will be touched on, as some have already.

Now, I wanted to pick up on the transport issue and the audit and the survey that you commented on relative to fitness for service of trucks through what you talked about.

And to BWXT, were any of your transport vehicles part of -- identified through this process as being unfit for service or breaking any sort of policies, procedures or guidelines for transport?

MR. MacQUARRIE: It's John MacQuarrie.

No, none of our vehicles were. I would like to add and just explain how we transport. So we have three trailers that are used. They are owned by us and they're dedicated for the transportation of powder in drums, of pellets and of bundles to our customers. So we own those, we maintain them and look after them. We have a good preventative maintenance program. We have not had any issues with any of those transports and we feel quite confident that they are well maintained. We use a dedicated company that supplies the tractor and the driver for all of our transportation. They have performed well for us and we have not had any events with them.

MEMBER DEMETER: And in the event of a serious accident, like a T-bone to the trailer, what would prevent the dust from being aerosolized? What would contain it?

MR. SNOPEK: Dave Snopek, for the record.

The material is transported -- well, there

are two types of -- really, three types of material that's transported and our emergency response plan with Transport Canada addresses all three of those as well as the various accident conditions that could exist on a highway.

The first is powder. Powder is transported in steel drums that have closures on the lids. They are packaged within the trailer securely.

The second is pellets, pellets going from -- largely from Toronto to Peterborough, and they are transported on skids.

And the third of course is finished product, which is fuel bundles, where pellets are contained within the fuel bundle matrix itself inside the zirconium tubes.

In those cases there are various levels of transportation accident. There can be minor accidents where the truck is no longer serviceable, but there is no release of the contents of the truck.

The next level of course is if there is, in your example, a T-bone or a more significant accident where material is spilled out of the truck, in that case the material would be -- it's uranium, it's heavy, basically we would go in and we would recover it. We would

provide technical assistance under our Emergency Response Plan to the first responders to be able to do that, on how to safely do that, most importantly, about what the true hazards are. We would also provide technical assistance in terms of surveying and identifying where the material is and when the material is completely removed.

We also have a third-party outsource that is able to directly support in the removal of the material, let's say from the side of the road, and put it into conforming and legal packages and transport alternate conveyance so we would be able to transport it off the scene.

So all of those types of materials and all of those types of accidents are covered under the Emergency Response Plan.

MEMBER DEMETER: And have you ever had to exercise that plan with a spill?

MR. SNOPEK: Dave Snopek, for the record. No, we have not had a spill of material transporting uranium.

THE PRESIDENT: So staff, BWXT's transportation vehicles may not have had issues, but what about others that transfer radioactive materials? I mean

those were very alarming statistics that were presented. Can you shed some light on that and what action has the CNSC taken in response to that?

MS TADROS: Haidy Tadros, for the record. So yes, definitely, the comments made are concerning.

I will pass it to our colleagues in Ottawa to talk about our own oversight in this area.

I would also like our colleagues to talk about our work with Transport Canada, especially as it pertains to radioactive material.

So with that, Ottawa, if you can please provide an answer.

MS OWEN-WHITRED: Karen Owen-Whitred, for the record. I am the Director of the Transport Division.

So first of all, with respect to the statistics that the intervenor mentioned, I believe -- we have heard this before, this same statistic. I believe it originated from comments that were made during a CNSC hearing in 2013, that 25 percent of trucks carrying Class 7, so this is radioactive material, were removed from service by the Ontario Ministry of Transportation. We had followed up with that at the time and we found that that

statement is a bit misleading. It was actually based on a very small number of inspections, from our understanding somewhere in the order of seven or 10 inspections.

Also, when we talk about removing a truck from service, this typically has to do with -- it can have to do with some very minor elements of the transport. So for one example we discovered that the Ministry had removed a truck from service because there was a loose block on the deck of the truck. So it's the type of thing that does not pose a risk or a concern in terms of radiological safety, it's more of a truck maintenance issue.

So for those reasons, after we had followed up with the Ministry of Transportation at the time, we determined that this was not -- this particular statistic was not a source of concern for the CNSC.

The second part of the question I believe that was raised by Ms Tadros is just to speak about how we do cooperate with Transport Canada.

So the CNSC has a Memorandum of Understanding, an MOU, with Transport Canada and in that we talk about ways in which the two departments can coordinate and cooperate to make sure that we are most effectively providing oversight for the transportation of dangerous

goods as a whole in Canada, and of course the CNSC gets involved with respect to Class 7 dangerous goods. So again, that's radioactive material.

So that is regarding the specifics of that intervention. If you would like, I can talk about transport safety more generally, but I'm not sure if you want me to get into that right now.

THE PRESIDENT: No, I didn't want you to get into that, but are there more recent statistics that would show that -- you know, you may say these violations were not necessarily of safety significance, but it probably indicates an underlying concern of how diligent are they in their transportation. So are there more recent statistics available?

MS OWEN-WHITRED: Karen Owen-Whitred, for the record.

Yes, thank you for that.

What I can say is that there is something on the order of a million packages carrying radioactive material that are transported in Canada every year and to date we have never had an accident, a transport accident that resulted in a release of material to the environment or that would cause any risk to human health. We have a

system of reporting, so anybody involved in transport is required by regulation to report to us with respect to any event, even the most minor and we do get a number of those, but we don't -- none of those have any safety significance. They are, as I said, very minor.

What I would say, because this has come up in one of the other interventions, is that there was an intervention that mentioned an accident that took place in Saskatchewan a few years ago that involved a transport truck rolling over that carried -- it was transporting drums of yellowcake and in that case, which was perhaps the most -- one of the most significant events that we would have ever had reported regarding transport, again there was no release of nuclear material to the environment. So the protections that are put in place to ensure transport safety were effective in that particular instance.

THE PRESIDENT: Thank you very much.

Dr. Berube...?

MEMBER BERUBE: Ms MacKay, thank you. Thank you very much for your time in coming here and speaking to us.

I believe I heard you say that CNSC had not consulted with the community prior to this hearing.

Did I hear that correctly?

MS MacKAY: Yes.

MEMBER BERUBE: CNSC, could you respond to that? I mean I find it hard to believe that you wouldn't have come and talked to the community before this.

MS TADROS: Haidy Tadros, for the record.

So what we have done in preparation for the hearings here in Peterborough as part of our engagement activities is we came into the community, as Dr. Ducros had mentioned in our presentation, in late January for the Meet the Nuclear Regulator session, where we advertised that we would be here for I believe it was two days, a morning session and an evening session, where we had our specialists available to speak to what we do, how we do it and what specific concerns or questions the community may have with regards to BWXT's licence application. So that took place in January of 2020.

And prior to that we have used other mechanisms to try to reach the community with regards to webinars. We have had a very successful webinar on the licence application and BWXT as well.

Perhaps I would ask Dr. Ducros to speak to anything else that she was involved with.

DR. DUCROS: Caroline Ducros, for the record.

Yes. Just to clarify, we were here in the community on January 23rd for an evening session and in Toronto on January 22nd. The webinar was on January 8th. But that was the lead-up to the hearing.

Throughout the year we do attend the Community Liaison Committee meetings in Toronto and once the Community Liaison Committee is set up in Peterborough we fully want to participate in those. We do have a dedicated stall at the barbecue events where we are available to answer any questions about the regulator and about how we regulate.

In addition, we attend any other public outreach that BWXT sets up so that we can be there to inform about the CNSC's mandate and how we do the regulation.

We are also in the community, as we discussed earlier, with the Independent Environmental Monitoring Program campaigns and we come prepared at those with identifiable clothing and information documents.

At the Meet the Nuclear Regulator session we took care to bring information pamphlets as well, we

directed people to the website, and we also took, whenever anyone was willing to provide it, email addresses so that we could ensure that they were on our subscription list so that they got pushouts from the CNSC.

MEMBER BERUBE: So let me ask a question. Here we have the intervenor, Ms MacKay. Ms McKay, how do you usually get your information at home? How do you come about knowing whether somebody is in town or not that you would want to see?

MS MacKAY: I just moved here a little over a year ago and I knew nothing about -- but I have also talked to my daughter who has lived here for 25 years and did not know what was going on there.

I went to those events. The information is -- I don't know how to say it, but first of all, the public doesn't know the questions to ask. They don't know. We don't know what you do here. Just the way the questions were answered and the doublespeak that was happening at those events, and I have to say that because I am disgusted when I see what has come since.

So I live in the east end, I hear that they sent pamphlets around BWXT. I don't know about CNSC. Like we don't get the information, the everyday people

don't get the information.

MEMBER BERUBE: So I guess the question is, how do you get your information? How do you know what is going on in the community? I mean, because what we are hearing across the board here --

MS MacKAY: Yes.

MEMBER BERUBE: -- is that people just aren't being informed that even something is happening. Here, obviously activities are happening --

MS MacKAY: Yes.

MEMBER BERUBE: -- but you don't know anything about it and so I am asking, how do you get your information? Is it word-of-mouth or is it flyers in the mail? How do you get this?

MS MacKAY: The flyers go in the garbage.

MEMBER BERUBE: Okay. Garbage, flyers, okay.

MS MacKAY: They are not effective. If you get 3 percent response from a flyer you are doing well.

MEMBER BERUBE: Okay.

MS MacKAY: So they are not that effective. And if they are just around that little area, how many are you going to get, you know, out of 4,000?

There's 80,000 I think or 85,000 people here. This needs to be a Peterborough issue, not a neighbourhood issue. It affects all of us.

So like as far as getting my information, like I don't know how I get -- like I go on Facebook, but I'm not going to look for CNSC or BWXT. I really -- it's up here somewhere, you know. Geez, I don't get the newspapers.

But the only way I found out was my daughter told me to there's a meeting going on about this issue, so I decided I was going to attend and I have been involved ever since. But otherwise, I really wouldn't know what you people do, what -- really.

And I mean reading all of your materials, like I have read so much in the last year about CNSC and BWXT and it's gobbledygook for me. Sorry, I don't get your statistics, I don't know what you're talking about. And the language is not the language of the people, it's the language of your peers, and I think a lot has to be done about that. Like get out with the people. Don't have this barbecue on a pouring rain day, which you have no control over, but like a pouring rain day, rainy day in the middle of the afternoon when most people are working. Like give

me a break.

The Evinrude event, the first turnoff was the police there. There might have been 25 people who attended, but you just got this feeling that like you are not approachable. Sorry, I get turned right off with that sort of thing. Get out there and shake hands with the people. Don't put on this fancy little thing and expect us to come and ask questions that we don't even know how to ask. It's not okay. You need to be transparent, you need to give the information about what is going on. And things like this beryllium stuff going on, that should be public and not just, oh, we don't know what to do that. Tell us. Treat us like a community.

MEMBER BERUBE: Thank you very much. Thank you very much for that. Do you hear that, CNSC? It's loud and clear. Okay.

MS MacKAY: They heard that. Thank you.

THE PRESIDENT: Thank you. Thank you for that.

Dr. Lacroix...?

MEMBER LACROIX: Madam MacKay, I am not supposed to say that, but I kind of like you.

--- Laughter / Rires

MEMBER LACROIX: And do not feel bad about the fact that you don't know CNSC. I work in engineering with PhDs all over the place and they have no idea what CNSC is doing. Just the name CNSC, they go, "What does it mean?" So don't feel bad.

I have noticed that in your presentation -- not in your presentation, but in your submission that there is some confusion between recommendation and decision, and perhaps it is time for CNSC to seize the occasion and to summarize for Madam MacKay and for the local residents, and also for all of us, what are the main steps of a licence renewal, when does it commence, what are the roles of the regulator, of the licence applicant, and what is the role of this Commission over here, the Commissioners? So could you, in a nutshell, summarize the main steps, please?

MS TADROS: Haidy Tadros, for the record.

So we will go through the information that we had in our slide with regards to the licence application and maybe not read the speaking notes this time but have a conversation and try to inform on how the process has unfolded for this renewal.

MEMBER LACROIX: Okay. The type of answer

that I would like to get is an answer that Madam MacKay will understand and I will also understand, okay.

MS TADROS: Understood.

MEMBER LACROIX: Thank you.

MS TADROS: So I will pass it to Dr. Caroline Ducros.

DR. DUCROS: Caroline Ducros, for the record.

So I will walk through this chart and if at any time you feel like I'm straying, please bring me back, because I will be doing my best to speak in a way that is understandable but I'm not always sure if I am gauging that correctly.

So the first box in the receipt of the licence application. We receive from the licensee a licence application that comes into the Secretariat and it's given to the staff. The Project Officer, in this case for BWXT, is Julian Amalraj to my left. He will look at that licence application and ensure -- sorry, am I good?

MEMBER LACROIX: My first question is --

DR. DUCROS: Yes...?

MEMBER LACROIX: -- when did you receive the first application?

DR. DUCROS: In November 2018. That's when the application arrived.

MEMBER LACROIX: Okay.

DR. DUCROS: So when the application arrived, we looked at it to see whether it was sufficient. And what we mean by sufficient is that it contains all the information that we require as the regulator to ensure that all the regulations that apply to the activities that that licensee is going to be carrying out have the information that we need to see that we are going to say this is okay. So we have a framework in place with 14 safety and control areas. We look for all of those and we make sure that that application is complete.

Julian mentioned in the presentation that we have a team of experts that have expertise in each of those safety and control areas. So those include emergency management, radiation protection, environmental protection, safety analysis, safeguards, et cetera. So we look to see that they have covered all the bases basically.

If they have covered the bases, we also then do a second set of analysis to say is the information of good enough quality and enough for us to be able to do a technical assessment of that.

So then, if that is the case, we go on to the technical assessment and that is distributed to all the special -- sorry, the subject matter experts that I referred to earlier. They look through their area.

So transport will look through and say, "Do we have enough?" If we don't, we go back to the licensee and we say we need more, demonstrate to us. If this is a new licence, this iterative process might happen often.

If it's a licensee that has been in operation for a while, we would be on top of it to know if their programs are in place, have been well functioning, we have been doing compliance verification on them, so we will have a good sense of that. However, we might ask them to update certain things. We might say, you know, there is a new regulatory document in place and you need to come into compliance with that.

So that's the technical review part.

MEMBER LACROIX: Okay. If I stop you there.

DR. DUCROS: Yes...?

MEMBER LACROIX: It's a back-and-forth process between the regulator and the licence applicant;

right?

DR. DUCROS: At this point it is, yes.

MEMBER LACROIX: Okay.

DR. DUCROS: Yes. Which sort of deals with why it is that we won't -- we will never give a recommendation -- this is jumping some steps so I will get to that after, but we won't give a recommendation to the Commission until we have done a thorough review and we are comfortable giving a recommendation to the Commission. So a lot of things that don't come to the Commission are licence applications that we didn't think were good enough.

So once we get to the point where we're at the technical review, sort of concurrently there we have to check that other federal acts apply in terms of environmental assessment. So if an application came in before August, the *Canadian Environmental Assessment Act, 2012* applied. We look at that and we look at that Act and the regulations under that Act to see whether this proposed activity, this proposed licence needs an environmental assessment or not. And it's based on regulations designated physical activities in that Act.

After that, for the newer licensees, since the *Impact Assessment Act* has now been promulgated, we will

look at that Act to see whether an impact assessment would be required. In this case we did that determination and this licence application did not require a federal environmental assessment. However, under the *Nuclear Safety and Control Act* we have to. We have a mandate to protect the environment. So we do do an environmental assessment of our own and that we call an environmental protection review.

So that is one of the 14 safety and control areas that we expand upon. So we write a review and that looks at a lot of the issues that people are concerned about: the emissions, the interactions with the environment, the sources, possible sources and health effects, et cetera.

So I'm looking now at the green section here. That's the environmental protection review and the technical assessment.

Once we have assessed everything, we compile that into the Commission Member Document, the one that we are -- in this case it's 20-H2, and we give our recommendations on all those 14 safety and control areas and also a review of matters of other regulatory interest. So that's where the indigenous engagement, public

participation review come into play, and the financial guarantee.

So all that is in the Commission Member Document that we submit and we make public, the application. So I'm not talking about the Secretariat's process, I'm talking about CNSC staff's process. The Secretariat will also make the application available to the public and then the CMD we will give to the Secretariat who will make that available to the public.

And then throughout -- you will see on the vertical axis -- we have the public engagement. So this is why we do do certain activities in preparation for the hearing to make sure people are aware that there is a hearing. And we are hearing loud and clear that we need to improve on that and that we are not reaching everyone, but the intent is and our hope in the future is that we will be able to make sure that people are aware that there is a hearing coming on and to tell them how they can participate.

So concurrent in this process there is a Participant Funding Program that people can apply to and the purpose of the program is to give people some capacity to give value-added advice and information to the

Commission for the Commission to make its decision.

So at the Meet the Nuclear Regulator session that I attended with some of my colleagues, we tried to show where those links are, who the Commission was, how decisions are made and how you can participate.

So that's sort of the vertical axis, ongoing engagement. The ongoing engagement is throughout the whole process, but this is particularly for a licence renewal application.

Then we have the hearing and the documents at the hearing are the Commission Member Document from the staff and the Commission Member Document from the licensee and all of the interventions.

In this case we did write a Supplemental Commission Member Document because we wanted to assure everyone that the comments are really well received and they are pertinent and we have reviewed these aspects and this is our comment on the comments. So the Supplemental CMD is CNSC staff's comments on comments, if you will, for consideration at the hearing.

After that, CNSC is here to answer any questions that the Commission may have and it's out of staff's hands, it's up to the Commission.

MEMBER LACROIX: If I could summarize all the explanations that you provided us.

From the first box, the top box to the exit of the two green boxes, a year and a half has passed and at the public hearing you have reached, staff has reached a conclusion in which you make a recommendation and today we examine these recommendations and at the exit of the bottom box, Commission decision, you will have the final decision; right?

DR. DUCROS: No. The Commission will make the final decision.

MEMBER LACROIX: I'm sorry, the Commission will make the final decision.

DR. DUCROS: Caroline Ducros. That's right.

MEMBER LACROIX: Right. Okay. Okay.

DR. DUCROS: Yes.

MEMBER LACROIX: Does it answer your question, Madam MacKay?

MS MacKAY: No, it doesn't, but thank you. What I am suggesting is, like you mentioned, a year and a half has gone by and we are just finding out. Like I don't care about when the hearing is,

you have already made all those decisions. What I read before all of this leading up to the hearing is recommended-approved, recommended-approved. I feel like I don't even need to come here because you have already wrapped it up.

What I am suggesting is have a hearing before you start this process and let the community know and let them say what their concerns are. We don't want it here. We would like to say that at the beginning and then hash it out. That's what --

THE PRESIDENT: I think what you are saying is not necessarily have a hearing before, but have some kind of a community meeting before the assessment even starts --

MS MacKAY: Yes, a huge --

THE PRESIDENT: -- so you hear from here what the issues are, what the concerns are --

MS MacKAY: And we get --

THE PRESIDENT: -- and get the input right then?

MS MacKAY: Yes. And we get --sorry, we get to ask our questions and our worries and what is going to happen. It's a long process, but a proper process.

THE PRESIDENT: And you want to be engaged throughout the year, year and a half --

MS MacKAY: Absolutely.

THE PRESIDENT: -- before you come here?

MS MacKAY: Yes.

THE PRESIDENT: Staff is nodding. I think they --

DR. DUCROS: Caroline Ducros, for the record. I concur.

THE PRESIDENT: Thank you for that.

Dr. McKinnon, anything else to add?

MEMBER McKINNON: Yes. Actually I am going to change the topic.

THE PRESIDENT: Or do you want to save it for the next time?

MEMBER MacKAY: Are we running really short?

--- Pause

THE PRESIDENT: So, Ms MacKay, thank you very much for your intervention. Any 30-second closing remarks you would like to make?

MS MacKAY: Do the right thing. Do the right thing. We are worried.

THE PRESIDENT: Thank you. We hear that.
Thank you.

We will now take a break for dinner and
resume at 6:50 p.m. Thank you.

--- Upon recessing at 6:05 p.m. /
Suspension à 18 h 05

--- Upon resuming at 6:51 p.m. /
Reprise à 18 h 51

THE PRESIDENT: Okay.

The next presentation is by Ms Deirdre
McGahern, as outlined in CMD 20-H2.157.

Ms McGahern, over to you.

CMD 20-H2.157

Oral presentation by Deirdre McGahern

MS MCGAHERN: Thank you.

My intervention is very personal, so I'm
just going to start out by telling you how my week is
going, which is not good. I am exhausted.

I have been dealing with skunks for months

and everything came to a head this week and I said, you know what, you guys have to go, us trying to be neighbours is not working out. I am woken up every night with the digging, there is the smell about the place, there is the constant stress that a stink bomb might go off at any time or I might get sprayed.

So I borrowed a trap from a friend and two nights ago I successfully live-trapped the skunk, relocated it 18 kilometres away and released it and now things are looking up. There is space between us, the skunk walked away unharmed and I came home at 5:00 in the morning and went to sleep. So things are looking up on the home front, but a little space goes a long way sometimes.

So my house is less than 500 metres from BWXT in Peterborough. I bought it in 2011 after my friends purchased the house behind on Sherbrooke Street. I wanted to live next to them, so I put notes in the neighbour's mailboxes asking them to give me a call if they decided to sell. A few weeks later Cliff called. He had a small wood-framed house on a huge lot with a wood stove and was ready to downsize. It needed a ton of work but it had a great feel.

So two months later I took possession and

my friends and I started ripping it up. We ripped out a bunch of old, dirty, disgusting building materials full of secondhand smoke, carpet, wallpaper, fake wood panelling, mouse nest, wasp's nest, rotten beams, roof leaks, shoddy electrical, the gamut, and in many ways it felt like my small hundred-year-old house was well on its way back to nature.

I am a straw bale builder. I own and run a company called Straw Works Inc. We build straw bale and other types of super insulated non-toxic walls. And maybe my next house will be straw bale and now I am faced with that question, but in getting started it was easier to buy an old house and renovate it in a completely environmentally sound and non-toxic way and that's what I did.

I made the walls thicker and added cellulose insulation to R-30. I raised the roof and added 24 inches of insulation to R-80. I waterproofed and insulated my basement. I redid all the plumbing and electrical and now my old cold house is warm, dry, cheap to heat and doesn't need air conditioning.

Materials were chosen that have a low carbon footprint and by doubling the code required

insulation levels and diligent air sealing, I cut the operating carbon emissions in half. Cliff used to burn two to three cords of wood a year and run an oil furnace and now I solely heat with wood and burn one to two cords. Greta would say that my house is now on the right side of climate change.

Similarly, the energy efficiency retrofits I did through LED lighting, Energy Star appliances and habitual conservation are an example of a way of many ways that Ontario can secure tomorrow's energy without spending billions to rebuild old nuclear reactors or build new small-scale ones.

I also addressed indoor air quality. The indoor air quality of most new homes or newly renovated homes is often more polluted than outdoor air because of the materials that we put into them. For example, drywall mud, the wet stuff that comes in a pail, contains mildicides and fungicides so that it doesn't spoil on the shelf, but then those mildicides and fungicides are in your home. So it took more time, research and money to source non-toxic paints, caulking, finishes, but avoiding toxins that may make me sick or other people sick is fundamental to me.

All of these things, the super levels of insulation, the natural building techniques, the non-toxic materials and the energy-efficiency make my house a unique sample board for my clients. They can come over and see lime-plastered walls, deep window wells, an earthen floor in the basement, an earthen floor in my living room, tadelakt, a special type of water-resistant lime plaster in my bathroom and my shower, homemade milk paint, a retaining wall made of compressed earth blocks.

I'm almost done. I have a handful of trim projects and I am currently putting in new kitchen cabinets, formaldehyde-free, but I have a sinking feeling that right around the time I will be finishing I will be getting the news that the CNSC has approved BWXT's licence application and they will have the flexibility to begin pelleting operations. And if that happens and if pelleting begins, everything that I have worked so hard for will be for naught.

As the old adage goes, what is the point of having a home if you don't have a healthy planet to put it on? What is the point of having a non-toxic home if a company less than 500 metres away is allowed to release significant amounts of radioactive and heavy metal

emissions and contaminate everything that I have done?

I'm not going to get into the science in my 10 minutes, but suffice it to say that I am educated and informed, I know what is at stake here and I do not want pelleting. I am a local resident that has made significant investments in my property. I am an employer that pays excellent wages plus profit-sharing to my employees, one of whom lives across the street from BWXT and will be intervening here on Friday. I have something to offer this community and I now also have something to lose and my stake in this should matter.

I do not want the risks. I do not want the stigma. If pelleting begins, my street and the other streets immediately surrounding the old GE grounds and the BWXT facility will take more than our fair share of the stigma of industrial contamination. The stigma won't be spread evenly over what has become known as the zone, the 2 kilometre radius around BWXT. No, the streets immediately surrounding the plant will take the brunt of the stigma. I can already see it on people's faces when we are talking about pelleting and I say I live on Paterson Street. It's a look of pity and worry.

A friend of mine who gardens in my

backyard told me she didn't want to garden here anymore because of what is happening at BWXT. The licence hasn't even been granted and the stigma already exists. I have worked so hard to create a home that gives me the feelings of comfort and safety and now I am faced with worry and pity.

And the radioactive signs won't help. In January I walked around BWXT in Toronto and I saw the radioactive signs taped to the doors of one of the buildings. I don't want to see radioactive signs in my neighbourhood. Does anybody want to see radioactive signs in their neighbourhood? Those signs mean danger because there is danger and that is not what I signed up for.

This neighbourhood has suffered enough from decades of industrial pollution of the worst kinds: PCBs, asbestos, uranium, beryllium, hydrofluorocarbons, just to name a few. We deserve an environmental assessment, a cleanup, a moratorium on pollution and healthy long-term investments. Proposing pelleting now here is like adding salt to wounds.

I'm going to show a few slides.

So there's the sign on one of the buildings in Toronto. Time for some new duct tape I think.

There is Cliff and I when I bought my house. Got the keys, party. Gardening in the backyard. Leftover insulation. Demolition. Wasp nest. Chatting over the fence. Now, we have a gate.

This is raising the roof and adding 24 inches of insulation on top. This is outinsulating, framing walls and hanging them off the exterior as a way of adding R-30. This is what that looks like on the inside.

Wood windows as well. This is what one of those windows -- oh, this is lime plaster with wood window. That is that the same window finished. That is the window on the outside. It's, yes, all wood window painted with organic linseed oil paint, pine siding treated with lifetime wood preservative.

Siding in the winter with Solomon. My mom, work weekend. Varnishing the earthen floor in the living room. Sanding hundred-year-old pine floors. Finished. Pine siding on the interior and lime plaster both painted with homemade milk paint.

Coulson(ph), neighbour, cool dude, on his way to school, stopping to chat with me as I am outside working.

So I have a couple of questions for you.

If pelleting begins, what will the economic cost to my neighbourhood be? For example, how many businesses like mine will leave? How many jobs will be lost?

Number two, if the property value of my house on Paterson Street goes down because of the stigma of being so close to a uranium pelleting facility and the associated risk of radioactive and heavy metal contamination, if pelleting begins and my property values go down, will I receive compensation from the federal government?

In summary, as a stakeholder I do not want this. I am opposed to the CNSC granting BWXT a 10-year licence renewal, including the flexibility to begin pelleting operations in Peterborough. I do not want the stigma, I do not want the risks. I do not want my town to put its name behind this. Peterborough Pete's, not Peterborough Pellets. Good neighbours don't make radioactive pellets.

Thank you.

THE PRESIDENT: Thank you very much for your intervention.

Dr. Berube, we will start with you.

MEMBER BERUBE: Well, thank you for your intervention. And by the way, I like the way you build.

MS McGAHERN: Thank you. Thank you.

MEMBER BERUBE: Close to my heart actually, I like building that way myself.

MS McGAHERN: Great.

MEMBER BERUBE: You have covered a lot of ground.

MS McGAHERN: M'hmm.

MEMBER BERUBE: M'hmm.

And you are aware that we don't have an economic mandate; right?

MS McGAHERN: Yes. Yes.

MEMBER BERUBE: Okay.

MS McGAHERN: Just out of tonight.

MEMBER BERUBE: Right. So the questions you are asking, we can't answer, unfortunately. It's just not something we can address, but I am going to ask you this: Of all the things that you have talked about, what is your highest priority when it comes to the relicensing of BWXT? What do you think is something that we can discuss? Because you know what we can and what we can't I think.

MS MCGAHERN: Okay.

MEMBER BERUBE: What is it that is your top priority?

MS MCGAHERN: First of all, could I address your other points? Just that with this issue there has been a lot of buck passing, right? So the municipal government says that's a federal issue; the provincial government says that's a federal issue. So I bring up these issues of stigma and property values because those are the ones that fall -- I feel them deeply, this is very personal, but also those are the ones that no one is addressing, save a proper economic and environmental assessment would address those concerns. So I would like to say that to your first point. And I think it is a valid question. Like how do I get compensated? I stand nothing to gain, I stand to lose, how am I going to be compensated?

Okay. So then your next question was -- I'm sorry, can you repeat the question?

MEMBER BERUBE: Well, the question was, you know, aside from economic issues, which we can't really account for, what is your most pressing issue? And I can tell you one thing for sure is that the buck stops right at this table with the licensing decision.

MS MCGAHERN: M'hmm. M'hmm.

MEMBER BERUBE: You are talking to the decision-makers, so it's really important, take your time, think about what your top issue is and we are going to talk about that.

MS MCGAHERN: Okay. Well, over the course of the last year it has been quite a journey, I have learned a lot about this and so I am of two minds. I mean, frankly, I really think that we are at a crossroads with the nuclear industry in Canada and I personally feel that there are better ways of meeting our needs, our energy needs in Ontario and we really don't need to be doing any of this. I think we are doing this because it's a big industry and there's a lot of money at stake, but I think there's better, cleaner, safer ways of keeping our lights on. So that's one.

But on the other hand, why are we doing this in Peterborough, in the location that we are talking about in Peterborough? It's obviously not safe or we wouldn't be here today. We are talking to the Canadian Nuclear Safety Commission and we are talking about all these safety concerns. The location is the biggest issue. I mean I brought up my skunk analogy, it's tongue-in-cheek,

but I think you see where I was going with that. I couldn't get over the parallels in my life this week.

If BWXT wanted to do this, you know, somewhere -- personally, again, I am not a big fan. I think there are people everywhere and I think these are very dangerous materials. Still, the real pressing issue right here right now is the location. It's too close to home. It's too close to too many people and to kids. So that's my number one.

MEMBER BERUBE: BWXT, I mean this is obviously an issue that a lot of people are raising, is the location of the actual facility. Obviously, you have a long history here. The application clearly says you would like to continue operations here, maybe even expand. Maybe you can add some insight.

MR. MacQUARRIE: It's John MacQuarrie. We are quite confident that we operate very safely and without impact to the community. In fact, I think we offer a lot of positives to the community in terms of good employment and sponsorship and volunteering, which we have communicated. So I understand that some of the community members don't feel that way and we talked about we are going to increase our efforts to try and share

more information and hopefully they will see the value in what we do. But we think we bring a lot of value to Peterborough and we think we bring a lot of value through the nuclear industry. We think we provide clean air and a solution to the climate issues that we face in this country and around the world. So we are quite proud of what we do.

THE PRESIDENT: I would like to build on what Dr. Berube was asking, given our very narrow mandate. It's not economic. We don't get into the zoning type issues that you have raised. What is it that we can do? How does one address the stigma issue? Is it better education, is it better outreach? What we are learning from BWXT, what we are hearing from staff's assessment is that these are safe operations, that they really don't have an impact on the public, and yet there is a high level of concern. Something is missing.

MS MCGAHERN: M'hmm. I mean, I think it's a fundamental question of beliefs, right? I wholeheartedly believe that John MacQuarrie and BWXT -- and I have friends that work at BWXT -- believe different things than I believe. I don't know if we are going to be able to shake hands on that one.

I have done a lot of research. I hear

what Cathy Vakil is saying. I think that we believe different things and I am worried and I will most likely move. I don't think you can reconcile those things.

The people that are here that are expressing these concerns are really worried. There is too much at stake, there are too many unknowns, there are too many moving parts, there are too many really dangerous materials. You know, just the presentation on climate change alone. So as long as that exists there, I don't think that you can reconcile those things and make it go away. I think that it would have to be in another location for the people surrounding to feel better and for the stigma to go away.

THE PRESIDENT: Well, what if -- and I'm just thinking aloud. BWXT has said one of the big areas of concern is the high levels of beryllium that were measured in the soil in the school and maybe your cool dude neighbour goes to that school, I don't know.

MS MCGAHERN: He does. He does, yes.
Yes.

THE PRESIDENT: Okay. And BWXT has said that they are going to do some monitoring, something they haven't done in the past. And what if they picked a third

party that the community also trusts as opposed to anybody else, would that inspire more confidence? If the results are coming from someone that the community has been involved in picking and doing the sampling and doing the analysis and sharing the results and what do they mean, totally kind of arm's-length from BWXT, would that help?

MS MCGAHERN: Well, the trouble with that is that the monitoring happens after the releases, right? I mean that's what Dr. Cathy Vakil was saying. So if there is ever some sort of fatal accident -- and I am of the opinion that accidents happen all the time, accidents happen regularly. I know there's other intervenors that are going to speak to that. So after the accident happens and this material is used into the environment, the damage is done. So, you know, the monitoring happens --

THE PRESIDENT: So we look at that and we have heard the worst-case scenario. I mean BWXT has done an assessment. CNSC staff have independently looked at that. Given the amount of inventory that they have, even in their worst-case assessment they don't think it's going to be of any great significance.

I'm just trying to see how do we give confidence, if there is a way of doing so. I mean if it's

ideologically different, people aren't going to change. What you are saying is there are different values. Is there any area that we could try to influence to make sure that there is more light that's shone on what's happening there, what the results are and get people to have a bit more trust in what they are hearing?

MS MCGAHERN: I think that, again, the science is such that we know a lot, but we are learning new things all the time and it's complicated and it's in-depth and I don't think that we know everything there is to know about this topic. And I'm saying even if it means that one person gets cancer from this, that's too much.

I think that we are at the point in this community where we have sort of had it. We have sort of had it with this type of thing happening again at that facility. It's like the rain barrel's full, and you want to fill it up a little bit more. And we're saying no, enough's enough.

So I've sort of lost my train of thought there, but I really think that it's a location issue. And I think that I personally would feel a lot better if the facility was just built somewhere with a buffer zone around it, as other pelleting facilities are built in other places

in the world.

This will be, as my understanding is that this will be the first time that this type of facility exists so close to a primary school. That's a first. That's quite significant.

And as a builder, why not just build a building out there? I mean, it's a write-off. Like what's the big deal? I mean, sorry, I don't want to downplay it. I know it's a big deal. You already have all your operations here.

But I think there's another solution. Like why stress it? Why take the risk? There's another solution that can exist here. We're just talking about building it somewhere else. I mean, as you know, I feel differently about nuclear in general. But you know, this wouldn't be such a big deal if that's what was on the table.

THE PRESIDENT: Okay, Dr. Lacroix?

MEMBER LACROIX: What exactly bothers you the most? The radioactive substances or the chemical substances?

MS MCGAHERN: Wow, it's such a rabbit hole. You know, where do you start with this? Apparently

there's actually a double-whammy effect by the combination of those two substances in your body. So take your pick; pick your poison; they're all good. We don't want any of them.

MEMBER LACROIX: Okay, so if I understand you correctly, let's say that tomorrow BWXT says, Okay, that's it; we're leaving. And a new company comes in and they produce fertilizers.

MS McGAHERN: Well --

MEMBER LACROIX: No radioactivity, but a lot of chemical products. Would you oppose to this new industry?

MS McGAHERN: For example, a farmer decides to grow straw bales on the property. I would have concerns about that, actually. But I hear what you're saying.

I think that we would assess it once again; right? I'm not out there to slam anybody unnecessarily. I think there's real -- I'm really concerned. I think there's real risks. There's real things at play here.

So if there was, you know, something else on the table, we would assess what's going on and approach

it with the same type of rigour. Yeah.

MEMBER LACROIX: So essentially it's a question of location?

MS McGAHERN: Yes.

MEMBER LACROIX: It's the location.

MS McGAHERN: Yes.

MEMBER LACROIX: Thank you.

MS McGAHERN: You're welcome. Thank you.

THE PRESIDENT: Dr. McKinnon?

MEMBER MCKINNON: Yes, in connection with the location, while we were in Toronto, we were inquiring if there were any other instances around the world where there are similar plants. And it was mentioned that there are. So I was just wondering from CNSC if they've followed up or have any -- it's a very short time window -- but if there's any experience of how those companies have dealt with the immediate residents and tried to resolve this conflict.

MS TADROS: Haidy Tadros, for the record.

So yes, based on the conversations we were having yesterday, we have taken it upon CNSC staff to provide a written submission to the Commission with identifying here in Canada processing facilities that are

in different neighbourhoods that we, as CNSC staff and as the Commission knows, license.

They are in residential areas. We have a few in Port Hope. We have a facility in Kanata, my neighbourhood where I live. That is right next to a school as well. It doesn't produce or process uranium, but it is a nuclear facility.

And we are also looking internationally for different places in the world where processing facilities exist, their proximity to residential areas. So that is being looked at, and we'll provide a written submission that we would gladly put on our website as well to provide further information on that.

What is being done in those communities? Well, we can speak on behalf of the communities that we regulate here in Canada. Very similar to what we're hearing, there are community liaison committees, there are opportunities for engagement activities similar to the ones that we've described here today.

So the process is such that it meets the needs of the communities. There are some communities that are more engaged than others. But the objective in all of the work is to ensure that community members are aware of

what is in their community, if they have any questions or comments or concerns, that we hear them.

So that's typically what we have here in Canada.

THE PRESIDENT: Dr. Demeter?

MEMBER DEMETER: Thank you very much for your intervention. I love the pictures.

MS MCGAHERN: Oh, good, thank you.

MEMBER DEMETER: So I'm not going to ask a question, but I'm going to share with you that the message that I'm getting loud and clear from you and many intervenors is the issue of incremental increased risk, however low or very low it is, with the change in operations. So I want you to understand that message is coming clear.

MS MCGAHERN: Uh-huh.

MEMBER DEMETER: That irrespective of the level of increased risk and however you quantify it, that's what you're concerned about.

MS MCGAHERN: Thank you.

MEMBER DEMETER: So I just wanted to make sure you understand that's what I understand.

MS MCGAHERN: Correct. Thank you.

MEMBER DEMETER: You're welcome.

THE PRESIDENT: Well, thank you again for your intervention.

Did you have any closing remarks, 30 seconds, you want to say anything?

MS MCGAHERN: No, thank you.

Actually, I guess I would just say thank you. This has been more enjoyable, less intimidating than I thought it was going to be. And thank you for your attention and for your endurance, because this is a long haul for you guys.

THE PRESIDENT: Thank you for your thoughtful intervention.

Our next presentation is by Ms Trista Gilbert, as outlined in CMD 20-H2.184 and 184A.

Ms Gilbert, the floor is yours.

CMD 20-H2.184/20-H2.184A

Oral presentation by Trista Gilbert

MS GILBERT: Hi. Thank you.

Just like Dierdre, I didn't know we were neighbours. I'm just south of the BWXT facility on a road

called Chamberlain Street. So every time I'm in my backyard looking out my patio doors, I get to see what I have -- used to consider quite a lovely historical building with the lovely round windows and the brick and the cool roofs that I think were designed for World War II times where we're trying to blend in, look like a neighbourhood, and not attract bombings or something like that.

But it's been a cool spot to live until recently where I just happened to hear about a meeting. I attended an information session early January, and that's the first I knew about anything.

I'm not from the Peterborough area. I've lived on Chamberlain Street for only six years.

I'm not here to argue whether or not BWXT or any industry is or is not complying with ALARA, although I do find it hard to swallow that while as low as reasonably achievable is used to assess compliance, that there is no definition as to what does or does not constitute unreasonable. I'm referencing item 40 of the CNSC response to our interventions.

I'm here to stress that this kind of industry, their processes, and accompanying contamination and risks do not belong in the middle of a city, much like

Dierdre said.

The property of BWXT facilities Peterborough, owned by GE, has a rich history of toxicity which I've recently looked into, from asbestos to heavy metals to PCBs and other chemicals as well as uranium. Contaminants are in the concrete. They're in the ground. PCBs continue to flow from the factory after heavy rains, workplace incidents, and with the spring thaw, which often floods the factory floor, spilling contaminants into the sewers and on into the lake.

And just so you know, as a neighbour, there have been times where there for several days are trucks with giant pumps and workers in HAZMAT-like suits pumping out the sewers one small block over from me. And I've always assumed that if it was something that was posing a risk to me, that I'd hear about it, there'd be some kind of news. But many times the trucks take a few days and then they go away and then it's over.

And if you stick around for another week or so, you might actually experience the thaw that happens when the water tower hill, which the school is built on, thaws and Monaghan Road is under water and it runs into BWXT.

The CNSC's response regarding water contamination speaks to the process by which water is redirected and treated prior to being released into the sewers. But what about runoff? What about all the untreated water leaving the facility?

One of the presenters earlier this afternoon said that no beryllium has been found in the water. But that was a deceiving statement as they were speaking to the 2014, '18, and '19 reports, specific to the soil testing years. If you look at the 2015 annual compliance monitoring report, we saw a jump from virtually zero to 4.5 micrograms per litre average in water concentration to a maximum concentration of 65.5 that year.

I'm going to try and summarize some of what we've covered.

The Toronto facility from '14 to 2018 released about 46.2 grams of uranium into the air. Peterborough during the same time period only released 0.014 grams. We know that processing pellets increases presence of uranium. I'm not here to argue whether that presence is significant.

According to the "Summary of Selected Cancers, Peterborough County and City," a study done in

2012, Peterborough has some disturbing statistics. The report reads that relative to Ontario, Peterborough males had significantly higher incidence rates of lung cancer, 6.5 per cent, while Peterborough women experienced a 21.9 per cent increase. Perhaps even more alarming is that lung cancer mortality rates were significantly higher in men and women relative to Ontario, 6.6 per cent for men and 14.9 per cent for women.

While we cannot exclude factors contributing to cancer such as smoking, nutrition, physical activity, we need to ask is it possible that facilities such as BWXT and historically GE are contributing to this elevated number in the Peterborough area. Could the reason that more of us are dying from lung cancer be correlated to a particular type of exposure or layers of exposure? Asbestos can cause cancer. PCBs and heavy metals can cause cancer. Beryllium, as we've talked about already, can cause cancer.

Peterborough site failed its ALARA goal in 2018 for a three per cent reduction in collective whole body dose of radiation. Instead, it saw a six per cent increase. The same report monitoring in Toronto showed that the total number of samples exceeding internal control

level was five. This demonstrates that errors do occur. In this case, an operator was performing the task and was unaware to wipe the bowls before dumping.

How do these errors particularly affect workers and do errors result in uranium or beryllium or any toxicity not being filtered through a HEPA filter and being released into the environment?

Peterborough also failed its beryllium hazardous waste reduction in 2018. Instead of a goal of a 10 per cent decrease, we saw a six per cent increase. We've been shown how BWXT uses beryllium as part of the fuel bundle manufacturing process. We've already seen in the independent environment monitoring report an increase in beryllium in Peterborough soil samples.

And thank you, Dr. Demeter, for kind of pushing the point on that. I agree that there is a discrepancy, and it's not enough to just say things like in the CNSC's response in item 36 to our intervenors that it likely reflects short-term variations that are within the background range. I don't think that's good enough. I think you've already shown that you agree with that and there's going to be more soil testing and some kind of mandatory increase of checking.

But all we know for sure is that BWXT does use beryllium and there's an increase of beryllium. I think we need to study that more.

But my main issue is that there's layers upon layers related to the GE property. I realize BWXT are leasing this property, and I'm not trying to pick on one person in particular. But we've got decades of contamination on that property.

I've got neighbours and family working for BWXT as well. It's hard. It's hard to be here when I've got somebody that's supporting four kids and three foster kids on their income related to GE/BWXT.

But just ask the dozens of retired GE workers who have cancer. Ask the partners who are now widows or widowers. Our livelihoods should not come at the expense of our lives. Workers are adults who may choose to accept certain risks in their jobs, risks of which they should be fully aware.

But what about the families and children who merely share a neighbourhood with a facility such as BWXT? We don't get a choice. We read the studies, the newspapers, the compliance monitoring reports. We hear worker testimonies and we wonder if all that toxicity might

after all be affecting our health.

I'm asking the Canadian Nuclear Safety Commission, our public health officers, our government to make the decision on our behalf. Get these kinds of facilities out of our downtowns and our backyards. Reject uranium pellet processing next to schools and homes. Deny the licensing renewal application. Stop adding toxicity on top of toxicity. It's time to start cleaning up this 125-year-old mess.

It will not be an epic event. It rarely is. Some people will inhale or ingest toxicity of some kind in our soil and air, and others won't. Slowly cancer will start to grow in some of us. It may take 10 years, maybe 20 or even longer. Maybe it will grow in our lungs or maybe it will have travelled through our bloodstream to another area of our body. There will be no way to prove that there is a correlation or a common origin. Just ask the former employees and their families who have been denied Workers' Compensation.

But if I'm still living in Peterborough 20 years from now and my non-smoking partner develops lung cancer or one of my four children's kidneys start failing, I will have doubt, doubt that there isn't an underlying

cause, doubt that I or the CNSC might have been able to do something about it and didn't.

I hope I've planted a seed of that doubt in your mind.

Also just to point to the decommissioning fund, BWXT spoke to the fact that they will deal with the removal of their equipment and hazardous materials, but there's no plans to remove the buildings. And eventually the property will be returned to the hands of GE.

But if we keep extending licences and GE keeps extending leases, who's ever going to be responsible for true decommissioning of that site, that 125-year-old hole of contamination?

I think it's time that we look at what true decommissioning is. I'm not sure, but I think GE falls within your jurisdiction under the CNSC as well. I think it's time to ask them to be held accountable for this, the history of the site and to start true decommissioning.

Thank you.

THE PRESIDENT: Thank you. Thank you very much for your submission.

Dr. Lacroix?

MEMBER LACROIX: Is it the appropriate time to address the legacy waste question? Okay, well, CNSC, what are your concerns concerning the legacy waste on the facility in Peterborough?

DR. DUCROS: Caroline Ducros, for the record.

In terms of the legacy waste at the site, I can say something to it, but also want to note that the Ministry of Environment, Conservation and Parks will be here tomorrow afternoon, because we're talking about non-nuclear-related legacy waste from the GE plant.

THE PRESIDENT: So let me just confirm, then, that CNSC has no oversight of that facility other than the piece that BWXT's leasing?

DR. DUCROS: Caroline Ducros, for the record.

Yeah. The GE plant, that's not the BWXT nuclear facility, is not licensed by CNSC.

THE PRESIDENT: Okay.

Dr. McKinnon?

MEMBER MCKINNON: Yes, thank you. You raised a lot of very difficult issues.

So in connection with the legacy question

that we may be able to address, so my question is to CNSC, and I think this may be an epidemiological question, if I can say that right. Considering the history of the site, there are different types of cancers and so on that have been monitored. Is there any way to unravel the effects of uranium exposure to other types of chemicals from the past from the databases?

MS RANDHAWA: Kristi Randhawa, radiation health sciences officer, for the record.

So in terms of distinguishing I think is what you mean between uranium-related health effects versus other contaminant health effects, what we can say is that we understand or we studied the health effects of uranium. So we can, if we see effects on the kidneys, that's one way to distinguish that it may be uranium. But some of those other chemicals may also have similar toxicological effects, so it would be difficult to distinguish what has caused it because they may have similar effects. I'm not sure, maybe there is some clarification.

MEMBER MCKINNON: No, that was my question, whether you know the cross-effects could be distinguished, if they did cause similar cancers, in which case it would probably be very difficult to unravel, or

whether they would be uniquely -- you know, they would produce sufficiently different effects that you could attribute rates to one or the other.

MS RANDHAWA: Not necessarily. It would be difficult to distinguish between the two.

THE PRESIDENT: Dr. Demeter?

MEMBER DEMETER: Thank you for the intervention.

In keeping with the legacy issue, we heard yesterday that there would be a requirement for the licensee to return on decommissioning the state back to brown field, not green, say, but brown field status.

Maybe it would help, given that there seems to be multiple jurisdictions involved relative to legacy issues and -- what is our expectation of return to brown field, and when does the Ministry of Environment in Ontario take over? Maybe help me understand that.

MS TADROS: Haidy Tadros, for the record.

So I'll ask our expert in Ottawa, who's reviewed BWXT's preliminary decommissioning plan in terms of what is in there. But perhaps BWXT can explain exactly what the brown field is.

So I'll ask maybe Ottawa first.

MS GLENN: Good evening. Karine Glenn, for the record. I'm the director of the Waste and Decommissioning Division.

So ultimately, in the preliminary decommissioning plan that BWXT has submitted to the CNSC, they do say -- we talked about the brown field, and that is to clean the property to such a state that they can terminate their lease agreement with GE Hitachi. So return the property back to the lessee. And that means that they would need to clean up any of the contaminants that they generated in the term of their use of the site.

So they are not responsible under their lease agreement to clean up all of the legacy contaminants that resulted from past operations. But they are responsible for cleaning up anything that they generated as a result of their activities.

They have undertaken some cleanup of PCBs in areas that they occupy. That's already actually been completed. They did do assessments and testing with regards to hazardous waste that is non-radiological on site.

But ultimately anything that is non-radiological would fall under the purview of the

Province if it was not generated by BWXT during their licence term. It would still be overseen by the Province as well, whatever was generated during the licence activities by BWXT. However, those contaminants have to be included in the cleanup and costed, and they are as part of the preliminary decommissioning plan.

MEMBER DEMETER: And just to clarify, you said anything non-radiologic. But I assume that elements that are non-radiologic that they've produced during their process, such as the beryllium, would also be included in the cleanup, even though it's non-radiologic?

MS GLENN: Karine Glenn, for the record.
That is correct.

MEMBER DEMETER: Okay, thank you.

MS GLENN: So any contaminants that are hazardous, whether they're radiological or non-radiological, have to be cleaned up before they can release the property back to GE.

MEMBER DEMETER: Okay, thank you.

THE PRESIDENT: Dr. Berube?

MEMBER BERUBE: So I'm just going to add on to that, try and understand this.

So of course it's an old site. It's a

legacy site over 100 years old, apparently, many, many different activities happening.

So CNSC, I'm going to ask you this question. If they're supposed to clean up everything that they produced, who did the baseline study before they started?

MS TADROS: Haidy Tadros, for the record.

I'll ask Ms Karine Glenn if that was found in previous versions of BWXT's preliminary decommissioning plan.

MS GLENN: Karine Glenn, for the record.

The preliminary decommissioning plan, and I'll ask BWXT to expand on the studies that they've completed, refer -- reference studies that date back as far as '95, establishing the sources of the contaminants back to that time.

There's more recent studies as well that have been conducted to allow BWXT to conduct their own activities on site, so I'll ask BWXT to specifically speak to the studies.

MR. MacQUARRIE: It's John MacQuarrie.

So when it comes to what we have to clean up and when it comes to uranium or beryllium, there is no

baseline. We have to remove all of that material, take it all -- and those are the only two significant hazardous materials that we are generating in our process. There's nothing else that's significant that were created.

MEMBER BERUBE: You've got to take out the concrete, the whole nine yards, or how -- surface cleaning?

MR. MacQUARRIE: So in the case of, let's say, the Toronto facility, we expect we may have to what's called scabble the floors, which is maybe remove a layer of the concrete floors. The walls may need to be stripped back to remove drywall and things like that, and that will have to be surveyed and determine whether it's contaminated or not, so that's the type of thing that we're looking at.

MEMBER BERUBE: Just out of curiosity -- not curiosity, but your leasehold agreement with GE, obviously they're aware that you're going to be doing this activity and that they're going to take responsibility for the building at that point?

MR. MacQUARRIE: Yeah, in my view that's quite well defined in the lease agreement that we have.

THE PRESIDENT: So just carrying on on that theme, you do know what kind of hazards exist in your site. Was that part of your environmental risk assessment?

Is that what you need to do to make sure your workers are protected, whether it's from asbestos or PCBs in the workplace?

MR. SNOPEK: Dave Snopek, for the record.

We do an annual asbestos survey. This is asbestos that is potentially involved in the building materials of the facility. This is actually done by GE as the owner of the facility, and the objective of that survey is to identify and then, where asbestos-containing materials are, and inspect the condition of those materials to ensure that they remain in good state and are not damaged.

If they are found to be so, then they're remediated, so they'll either be removed or repaired.

So the asbestos in the building, a lot of it has been removed. There's not a lot in the building.

In terms of PCBs or any other kind of contaminants that might be in the soil, those don't present a hazard to workers. The facility is largely paved.

Most of our activities take place in the buildings. We do transit between buildings, but that's on -- largely on paved surfaces.

THE PRESIDENT: Thank you.

Thank you for the intervention. There are other issues that you've raised, but we'll be discussing those over the next few days to give the other intervenors a chance to have some of their issues addressed.

So thank you very much for your intervention.

Do you have a closing comment you wanted to make?

MS GILBERT: May I ask a question?

THE PRESIDENT: Yes, you may.

MS GILBERT: So if the jurisdiction for the site itself falls to the province, I mean, that's a -- that's a noun that encompasses what?

Like who would you expect to be hold(sic) responsible to force an eventual decommissioning of the site? Who would I contact?

THE PRESIDENT: So tomorrow the representatives from the provincial Ministry of Environment, Parks and Conservation are coming. We'll ask them, and I'm hoping they'll give us a definitive answer.

MS GILBERT: Okay.

THE PRESIDENT: Thank you. Thank you.

Our next presentation is by Mr. Christiaan

Beyers as outlined in CMD 20-H2.211.

Mr. Beyers, over to you.

CMD 20-H2.211

Oral presentation by Christiaan Beyers

MR. BEYERS: Thank you for this opportunity to address this hearing.

My presentation is about the nature of the licensing process and about the role of CNSC itself as regulator.

To be clear, for the purposes of this presentation, I'm not contesting the continuation of BWXT's existing licence, but I am objecting in the strongest possible terms to its application to produce pellets in Peterborough. My points are as follows.

First, transparency of the licence applicant's intentions.

The CNSC has been willing to proceed on the basis of BWXT's pretense to be applying for the licence to have the flexibility to produce pellets at its facility in Peterborough. This gives an impression that this is an internal matter for the BWXT about the scope of its own

operations and it disregards public concern for the gravity of the situation in terms of the risks and impacts on health, safety, the environment and the community.

By abetting this approach, the CNSC has failed, it seems to me, in its function as public regulator.

Indeed, it seems to me that by adopting this maybe we will/maybe we won't strategy, BWXT was also attempting to mute possible reaction to its plans for pelleting in Peterborough so as to pass through the licence process with a minimum of public scrutiny.

As regulator, the CNSC should not be providing cover for such ulterior motives.

My second point is about the independence of the regulator.

The CNSC's CMD 20-H2 clearly and directly endorses, if not advocates, for BWXT's application to do pelleting. And this is well in advance of receiving any feedback from concerned residents of Peterborough.

The question of whether pelleting should or should not go ahead in Peterborough is never seriously entertained. This is not a tenable position, it seems to me again, for a public regulator.

If the matter is decided in advance, what are we doing here?

How does CNSC, in fact, treat the matter? Well, as per the CMD, it takes the question of pelleting merely as a commercial proposition, as a question of the viability of BWXT's plans, its capacity and competency to carry them out. These are the things that are prioritized.

Hearing this, one gets the impression that the onus is to anticipate objections and to adopt the applicant's side in systematically removing them.

It is not adequate that the CNSC restricts its scope and mandate of oversight largely to technical issues relating to the proposed nuclear operations. It claims that issues of location of the nuclear operations or other aspects of the environmental planning fall outside of its mandate.

Moreover, the CNSC's CMD relies heavily on arguments and evidence presented by BWXT, taking its claims of rigour and validity at face value. There is no line of credible scientific research in support of a counter-argument.

Dr. Cathy Vakil this morning already cited a significant number of sources in this regard.

It seems to me that this sort of research and interventions is more or less pushed aside.

Thus, the CNSC's response to what you acknowledge to be an unprecedented number of interventions in the CMD 20-H2, the supplemental document, finds no risk to the safety or health of the public or the environment from the proposed pelleting operations in Peterborough despite the specific evidence to the contrary cited in the interventions.

What would an independent regulator do in this case? It would be giving those who are intelligently opposed to pelleting a fair stand in their process and it would seek to consider their case in the strongest possible terms, including the science supporting their case.

My third point is around a low burden of proof.

Not surprisingly, BWXT makes very favourable claims about its own past record in matters ranging from safety to health to environment to risk management and so on when it analyzes the risks of pelleting in Peterborough.

These claims are taken at face value by the CNSC, it would appear.

Where the CNSC does appear to apply its own internal criteria and assessment, it assumes a low burden of proof in justifying the decision to grant a licence for pelleting. For example, in its CMD, the CNSC finds BWXT's performance to have been satisfactory for so-called Safety and Control Areas, CSAs, including areas such as radiation protection, environmental protection and security.

This conclusion is based on BWXT's own internal assessments in tandem with CNSC's compliance verification activities and occasional inspections.

Now, in Peterborough, we have reason to be doubtful about these inspections in light of the Shield Source case where the CNSC neglected to address the situation of dramatically under-reported radioactive tritium gas emissions over a period of almost two decades until it reached a critical stage with the sudden release of a massive amount of tritium almost exactly 10 years ago.

Given the proximity of the BWXT plant to vulnerable populations in schools and residential neighbourhoods, we certainly cannot afford lax oversight. Moreover, the standard for judging performance surely should be set at fully satisfactory given its proximity to

this population.

In the face of the exceptional situation in Peterborough of having a primary school located metres from the plant, the CNSC has had to take an extreme position, contradicting its own cautious claims elsewhere that there is no risk at all to pelleting so that it can disregard a normal application of the precautionary principle.

My fourth point is on public consultation.

At best, the CNSC's public consultation process, including this hearing, is intended to reassure the public that procedures are in place or will be put in place and to educate the public, which is presumed to be ignorant if they do not agree with the one-sided expertise that is provided here, that is, frankly, patronizing.

Beyond this, public consultation appears to be aimed at neutralizing dissenting voices.

The only recommendation that the CNSC's supplemental CMD has in responding to interventions is to improve communication and dissemination of information.

Accountability does not consist in better communication strategies designed to facilitate industry outcomes. It is, rather, a question of the autonomy and

integrity of the regulator.

As the expert panel of the Ministry of Environment and Climate Change found in 2017 in its report, "Building Common Ground", there is a pervasive public perception that the CNSC is biased and captured by industry.

Now that information about the application is spreading in the city, it is clear that there's widespread opposition to the BWXT application to pursue pelleting.

If CNSC still approves this application, it will divide the community and BWXT will go forward in bad faith.

This is a community that's haunted by a toxic past, as has already been stated by a number of presenters. The recent history of negligence of the CNSC in the Shield Source case has left a bad taste.

In closing, I want to raise a few questions.

First, why did the CNSC play along with BWXT's equivocating rationale of applying for the flexibility to conduct pelleting operations here in Peterborough? That seems to be dropped down in terms of

the presentation this morning, but at least that was the initial pretext.

Second, to what extent and how did the CNSC work with the BWXT company in the preparation of its application? And here I'm interested in the different levels of CNSC as an organization. What were the processes of coordination and collaboration?

Third, why does the CNSC as regulator not engage in the science that deals with the negative impacts of natural and depleted uranium dioxide and other toxic chemicals on human health and environment?

Fourth, has the CNSC ever turned down a licence application of this sort?

Fifth, why will the CNSC not consider the reasonable application of the precautionary principle in relation to the health of surrounding residents, and especially children, and why does it insist on adopting BWXT's position that pelleting operations are risk free?

And two more questions.

What has the CNSC done to respond to the most recent calls for greater accountability, independent and rigour such as the recent report by the Auditor-General of Canada in 2016?

And following, why does CNSC approve this licence regardless of the absence of social licence to do so?

I know that President Velshi stated earlier today that the CNSC does not consider social licence but, you know, be considerate here, as it bears directly on CNSC itself as regulator.

Thank you.

THE PRESIDENT: Thank you for your intervention.

Dr. McKinnon.

MEMBER MCKINNON: Thank you for all your comments. I feel a lot of them myself.

I have to declare that I'm new to this process, and if I was in your shoes I would also feel, you know, on the basis of one CMD 60-odd pages we make a decision on licensing. But being new to the process and having gone through reading all the documents, it's actually considerably more than that, so I would like to just ask CNSC to give a little bit of background on what happens leading up to the production of the CMD that makes it to this hearing.

In other words, this represents the tip of

an iceberg, and can you give some quick impression of the amount of work behind it compared to what actually may be seen by and perceived by the public as being the only work involved?

DR. DUCROS: Caroline Ducros, for the record.

I'll go into a little bit more detail on the technical assessment that I mentioned before the supper break.

The technical assessment includes the licence application, which is online. It also includes any supporting documents or technical studies that the licensee has submitted along with their application, also available.

We look at those applications in relation to -- so in the CMD, you'll see that we referenced what is required under a Class IB nuclear facility, what Regulatory Documents apply, which other standards apply, sometimes Canadian Standards Association standards, et cetera.

So the actual review includes the application, but also all the programs and processes that are in place that the -- because it's an existing facility, they have programs and processes in place, and so the references in the CMD will refer to those programs, the

radiation protection program, for example.

The environmental monitoring program would be another example, so we'll look at all those types of programs in detail.

And we have scientists on staff who will look at that based on their area of expertise, and all the references that I mentioned to you that apply to Class I nuclear facilities.

And I'll pass it to the project officer who coordinated that review and talk about the team and what goes into that.

MEMBER MCKINNON: Yes, and especially if you could give some indication of the time period involved prior to a hearing.

MR. AMALRAJ: Julian Amalraj, for the record. I was the project officer who led the technical assessment and the CMD for BWXT's licence renewal.

The process starts with the applicant providing an application which we look at it as initial document. And that was provided in November of 2018.

For up to March of 2019, CNSC Staff conducted a very thorough sufficiency and completeness review. There were several back and forth, including a

44-page report that was provided to the licensee on what was deficient in the application and what additional information we required.

There were several documents that were required, including the updated safety analysis, the preliminary decommissioning plans, individual program process documents as well as assessments that our specialist felt are needed to meet the requirements of the Class I Nuclear Facilities Regulation.

Subsequent to the licensee providing most of the documentation in April, and they continued to provide documentation up to July of 2019, we initiated the technical assessment part in May 2019. And we completed our technical assessment in August.

And subsequent to the completion of the technical assessment, we initiated the development of the Commission Member Document, which includes a review process as well as an approval of the strategy of the main elements of that.

And that led to the development and subsequent review and approval of the Commission Member Document which was submitted to the secretariat in December of 2019.

At that point, the hearing process is initiated by the secretariat and we arrive now here in March for the hearing itself.

DR. DUCROS: So Caroline Ducros, for the record.

Just to -- because I said it was in the CMD, I thought I'd give some more precision.

Appendix B of the CMD, the Staff CMD 20-H2, has the list of version-controlled documents that would have gone into that technical assessment.

MS TADROS: So Haidy Tadros, for the record.

The document that the Commission has before it has my signature on it, so as the Director-General of the Directorate of Nuclear Cycle and Facilities Regulation, my role in the CMD production process is to verify, read, check the references, challenge CNSC Staff when the messaging isn't right to better understand why are you making these statements and, if you do make these statements, how does that impact the message that we want to get to the Commission.

So I have a role to play as the Director-General of the Fuel Cycle, and that is why my

signature is on that document.

MEMBER MCKINNON: So this is some of the background as to why there's a high success rate of licensing.

MS TADROS: Haidy Tadros, for the record. High success rate for the licensing, I think the process is rigorous to the point where if staff feel that there is not enough evidence to come before the Commission, we will definitely communicate this to the licensee and it is up to them to pursue that.

We will be in a position to come to the Commission and say, "No, we do not recommend this licence" and if the licensee or applicant want to take that on, that is up to them. But the process is built such as staff do their assessment to the point where we will not let it pass our judgment in terms of what we can say yes on until we are satisfied with the information provided.

MEMBER MCKINNON: Thank you.

THE PRESIDENT: So on that note, have there been applications that you have not followed through to a recommendation for licensing to the Commission?

MS TADROS: Haidy Tadros, for the record. Yes, there have been applications that we

have gone back to the applicant to say, "In this area of the requirements, based on the regulations, you have not either provided sufficient information or sufficient rationale and justification for the lines that you are providing us". Either --

THE PRESIDENT: Mr. Ramzi Jammal.

MR. JAMMAL: Thank you, Madam President.

And I have empathy for our intervenors who are engaged in this process. We hear it quite often, we -- how can I say it diplomatically? But anyway, I'll try to use a proper wording with respect to that it seems to the outside that we are agreeing with an application of a licensee, but not recognizing that what you have in front of the CMD is after, on average, voluminous volumes of pages.

And what you see before you here is a fact team, a fact team that represents the whole CNSC. So in other words, you've got the specialists you heard from. Again, Ms Tadros said her signature is on the CMD and the buck stops with me as CROO.

We did reject licence applications and/or we gave recommendation to the Commission to limit operations of licence applications.

And I want to qualify what I'm going to say. Some licensees when we put stringent requirements upon them, they improve their operation. SRBT is one. SSI is another licensee who longer exists for -- not because of the CNSC, but because of their operational functionality no longer exist.

But I'd like to go back to the fact that the intervenor makes the reference of public consultation.

I would like to reiterate to the Commission and intervenors that no other regulator in the world -- we get reviewed internationally. The transparency that the Commission -- you as a Commission under your rule of procedures exhibit, second to none. And we take pride of this transparency from the PFP program to the recommendation to you because, at the end, you are the ultimate authority accept recommendation.

We -- that's why we put the supplemental CMD that is summarizing the interventions for your consideration.

Our recommendation to you, even though there's a word called verb recommendation, it is for you to consider and the ultimate decision is with you.

So I'm trying to package it all together.

It's -- there are rules of procedure in place. You are quasi-judicial but, at the same time, we need to do better in probably addressing the concerns of the intervenors in the process itself, how we get to this 100-page CMD or 200-page CMD from thousands of pages of the submission.

Do we need to look at how we are -- I mean, everything's available on the request. Let me start with this element. But is it transparent enough for someone to go and look at it and say, "How many requests the CNSC put in place, the staff back and forth in order to come to inclusive?" because the direction I have is we are not come to you with the deficient information.

We used to do that -- that was probably the process in a few years back where the Commission, we'll come to you and say the applicant will do this. Those days are over.

Now everything, all requirements has to be met and then we will provide you with either a hold point by which the applicant has to provide proof to the Commission and then we will put the process in place according to the rule of procedures.

I hope I answered your question.

THE PRESIDENT: Thank you.

I think what the applicant was saying was how can the -- how can staff make a recommendation without having done public consultation itself and then make a submission to the Commission.

Also for the intervenor's benefit, I've been a Commission Member for some time now. We do not always accept staff's recommendation. In fact, we just -- very recently, staff had recommended a 10-year licence for a facility, and we didn't accept that. It was five years.

So it's -- we do not always accept staff's recommendation.

Dr. Demeter.

MEMBER DEMETER: Thank you for your intervention. I just have a short comment.

I think it's -- I take your observations at heart because intervenors who come here see the end of a very long process and perhaps there's -- well, there is probably some significant improvement in the communication before the process.

Whether or not this will impact your opinion, I'm going to share it anyways. Commissioners are part-time individuals who have day jobs and lives outside of here. We all have content expertise in some area of the

safety that we're trying to improve upon, and we do challenge staff, we do challenge intervenors, we do challenge the licensee on areas especially in relation to our areas of expertise.

We get the information that you get, and we spend a lot of time deliberating it. And when we make our final decision, it spans before approval as recommended to not approval to a whole bunch of things in between. And those decisions are based on deliberations of all the information and a lot of hard work going and reviewing and considering the safety case within our jurisdiction.

So I -- it is not a pre-conceived ending that we are going to accept always staff's recommendations. We make an independent deliberation.

We are independent from staff, we are independent from CNSC. We have lives outside of it. That's why we're brought in.

So I'm not sure if that's reassuring or not, but for me, I take it, you know, with a heavy heart to make these decisions because I'm independent and I want to make sure I'm making the right decisions.

And I go through the same process you go through with regards to the information that you receive,

and we take intervenors' comments and feedback very seriously and we redirect and probe the licensee and staff based on the requests made.

So that's -- I, personally, feel, as an independent decision-maker in this process and I don't feel that I'm being swayed just because staff recommend something or the licensee wants something within the jurisdictional mandate of my position.

THE PRESIDENT: Dr. Berube.

MEMBER BERUBE: I just want to add to what Dr. Demeter was just talking about.

One of the things you mentioned was, you know, are we chasing down all the science that's brought to us from the intervenors. And the answer to that is we're evaluating that, absolutely, because we need opinion here. This is why there's a forum. This is why there is intervenors. Otherwise, what's the point?

You know, it's going to be a rubber stamp, why would we even bother with this?

So the reality is, we're looking for alternative thinking, we're looking for ways to question. And so all that's really, really valuable.

Also, don't forget that these people over

here are very intelligent. They do this a lot. And they're also looking at the interventions and they're chasing down all the references they can find and trying to figure out whether or not that makes sense or not as well. And that factors into the recommendations they're making.

So we're not blowing off anything. What we're trying to do is to come to a decision that is fair, equitable, science based because that's clearly our mandate, and that protects everybody's interests, and especially the public.

This is our fundamental requirement here, is to protect the safety and security of the public. There's no ifs, ands, buts or maybes about that. We take that very seriously.

I would like CNSC, if you could, just to give us an understanding of what you're doing -- what you do to actually chase down all the leads that the intervenors actually present in terms of the scientific papers, alternative thinking.

MS TADROS: Haidy Tadros, for the record.

Maybe I'd ask our health science specialist and our environmental protection specialist to look at that because I think at the heart of this is the

data and the research that's being produced.

MR. RINKER: Mike Rinker, for the record.

Maybe just to give an overview of the process that we go through, particularly as it applies to interventions.

I would say the 30-day period when the interventions from the public and indigenous peoples are filed is a very busy period for us. We have a full team you've seen. You can sort of estimate how many people are in Ottawa, plus the people that are here, but there's also a broader team that works on every individual application.

Amongst the CNSC, 30, 40 people are hands on dealing with the interventions.

We read them. We have a process in place for which we list and categorize the issues that get raised. We read through the publications that are presented and we test does that alter our scientific understanding of the issue and, if not, sometimes it raises issues that, okay, this is a consultation issue. We need to do better next time.

And we've heard a lot of that through the course of this hearing.

And so I think it's a very valuable test

for us.

If I could draw the analogy, I think this is an important philosophy behind public engagement is the notion of fragile system and anti-fragile.

So a fragile system is like a glass. You stress it, it breaks. Anti-fragile system is like a muscle. When you stress it, it gets stronger.

And I feel the public intervention and the process testing the CNSC and challenging us is -- makes us stronger. We have to test our assumptions, we have to test our ideas. We have to always rethink. We can't be constrained into, well, this is what we thought a year ago, it must be the same. We always have to relook at our work.

And this is a big amount of work that we do, and it's a huge value of getting the interventions.

THE PRESIDENT: Dr. Lacroix.

MEMBER LACROIX: Mr. Beyers, based on your -- the last sentence of your written submission, let me challenge CNSC.

With respect to all other nuclear regulatory agencies in the world, how is CNSC perceived by the International Atomic Energy Agency in terms of independence, in terms of credibility, in terms of openness

and transparency?

MS TADROS: Haidy Tadros for the record.
I'd like Mr. Ramzi Jammal to take that.

MR. JAMMAL: It's Ramzi Jammal, for the record.

We just finished -- last year was extremely busy for us on -- to undergo international peer review process. And I will speak -- the latest one is an IAEA review process that concluded that the CNSC is a -- I'm paraphrasing here in layperson terms -- a competent authority and has a robust regulatory framework in place and has commended for our transparency.

Canada has -- is a signatory to many conventions. That means treaty. The treaty in the UN language is a convention.

On many occasions and in specific the last convention, Canada was one of two countries where contracting parties received a good practice associated with the PFP program and other transparency.

So those are -- when you get a good practice internationally, that means every other regulatory agency in the world can benefit from our experience and they can learn from us.

In the last submission we had, again, it's not a matter of number, it's a matter of demonstration to the outside world. We got one of the largest number of good practices from the last submission we would receive, and again, it indicates for the other regulatory agencies around the world to copy and learn from us.

That does not mean we are complacent. We will always look what is working, we always take in consideration the interventions and, on many occasions, even though we -- many of the intervenors talk about rejection of a licence, but we can state many of the interventions that ended up in either a licence conditions in your decision as a Commission or amendments to the licence.

So that is a proof of what the consideration the Commission takes into account. On several occasions, interventions presented information that became a licence condition on the applicant.

So it's going both ways, and that's the key pillar.

And we undergo the regulatory review by peers all the time, but we're not complacent. We are always learning, and we are -- actually always encourage

the challenge to us at every occasion.

MEMBER LACROIX: Thank you for this clear answer.

THE PRESIDENT: Okay. Thank you very much for your intervention.

Do you have any last comments?

MR. BEYERS: Sure. It's a little difficult for presenters to respond in this context when they face an army of officials here and in Ottawa, and this is not simply a question of that it's intimidating or something. I'm talking about the slanted nature of this process.

And so, you know, you've all been paid to prepare for this and to shore up your case.

The process is designed so that you can have the last word, and you will have the last word. And so while this -- of course, I have thousands of thoughts that run through my head as I'm faced with all these responses more on a sort of a technical direction.

I've no doubt, for example, that there are all kinds of bureaucratic processes with all kinds of paper trails that are involved in producing the CMD and so forth. I don't see evidence of looking at alternative science to

show up the counter argument right to the end with self-assertions about the strength of the CNSC's processes in the international context. Well, that's just our assertion.

So maybe what to do is just let you have that last word.

THE PRESIDENT: We'll move on to our next intervention, and that is from Women in Nuclear as outlined in CMD 20-H2.143. Ms Lisa McBride will be presenting the submission.

Over to you, Ms McBride.

CMD 20-H2.143

Oral presentation by Women in Nuclear Canada

MS McBRIDE: Thank you. Lisa McBride, for the record.

Good evening, President Velshi and Commission Members. I'm the President of Women in Nuclear Canada, also known as WiN.

Women in Nuclear is a worldwide association of individuals focusing on women working professionally in various fields of nuclear energy and

radiation applications. WiN Canada was formed in early 2004 and has six chapters across the country, with over 2,800 members and growing. More than 2,000 of those members live and work in Ontario.

Since 2004, WiN Canada has worked towards three challenging goals. The first to make the public aware, especially women, of the risks and benefits of nuclear and radiation applications in food, health and energy. The second, to prepare women to take on leadership roles in the nuclear industry through knowledge and experience exchange as well as various professional development opportunities. And our third goal is to help fill the growing need for qualified workers in STEM and skilled trades in the nuclear industry.

Our members come from a variety of work experiences and education. We have women working at all levels of the business in all areas. We work in this industry by choice, and our members live in the communities surrounding because we know it's safe.

My discussion today will focus on three key areas, environment, safety and women in the workplace.

Environment. As women, we are always conscious of the environmental legacy we are leaving for

our children and grandchildren. We know that nuclear-generated electricity produces no greenhouse gas emissions and, therefore, supports our efforts to reduce the effects of climate change.

BWXT's licensed operations is critical to the industry in Canada to help us meet those climate change goals.

One of the biggest hurdles in the industry that we face is a lack of understanding of radiation exposure among the general public. Radiation occurs naturally in the environment. We know this.

In terms of operation, BWXT has a comprehensive environmental protection program geared towards monitoring and controlling radioactive and hazardous substance emitted from the facility. In terms of uranium emissions, Peterborough emissions are less than one percent of regulatory limit, and the Toronto emissions are approximately one percent of the regulatory limit.

In addition to internal monitoring and reporting practices conducted by BWXT as well as the CNSC's own independent environmental monitoring program, the Peterborough Public Health Unit also undertook a review of data for releases from both facilities.

The conclusion for all reviews were consistent. Emissions at both facilities were well below the regulated limits.

In terms of health and safety, BWXT makes considerable efforts to continually improve in all aspects of its operations, including training and safety of the workforce and the protection of the environment.

BWXT is consistently rated satisfactory in all 14 Safety and Control Areas as listed in CNSC's annual regulatory oversight reports.

BWXT has had zero lost-time injuries since 2014 at either location, Toronto and Peterborough. They continue to demonstrate a focus towards health and safety of their employees through a number of programs, including Workplace Hazardous Material Information System and by regularly reviewing practices and policies through a number of forums and committees, including their Health and Safety Policy Committee, Workplace Safety Committee and their Ergonomics Committee.

During my recent visit with a WiN colleague to the Peterborough location earlier, I was able to directly observe the clear attention to detail as well as the skill and competency of the BWXT in terms of safety

and execution of their duties at that facility.

Women at work at BWXT. As I mentioned, earlier this year we were invited to come to the Peterborough facility. This was not our first visit at this facility, as we were pleased to tour this facility as part of our conference program during 20015 Annual WiN Canada Conference.

During our most recent visit, I had the opportunity to talk to a number of women working at the Peterborough location who all had positive things to say about the environment in which they work.

BWXT supports women in the workplace in a number of ways. First, they have a diversity and inclusion program aimed at identifying barriers and conditions of disadvantage that could affect any of the four designated groups. This group meets on a regular basis and has established a communication plan that was scheduled for roll-out in January 2020, a clear signal of supporting women in the workplace in terms of the environment in which they work.

In addition to this effort, BWXT also supports a number of programs, including a flex hours program providing an additional day away from the

workplace, provides employees an opportunity to spend more time with family, and I've spoken to several women from BWXT who have opted into this program.

They all spoke of the benefits of this program allowing them to spend more time with family, volunteer at their children's school or even take time for themselves.

In addition, BWXT continues to provide employees with unassigned floating holidays, giving flexibility for personal time, providing greater ease to observe holidays that fall outside the designated statutory holiday schedule, all indicators of an environment which is conducive to women.

They also have a women's network established at the Peterborough location which is aimed at supporting women through a broader network. They're looking at ways to improve this initiative, and Women in Nuclear has offered to help BWXT with this.

They recognize the need for a focus on their talent pipeline and have encouraged more women to move into the STEM-related skilled trades roles. They support a number of pipelines, including the Ontario Tech University Women in STEM initiative.

As you know, WiN Canada has commissioned a study of women employed in the nuclear industry. Our focus is on opportunities or barriers for women in STEM, professional and technical designations and the pursuit of attaining leadership roles and the environment in which they work in.

BWXT is an active participant in our study and is very interested to develop further ways to support women in their organization not only in their career aspiration, but also in supporting the environment and health and safety roles in which they work.

BWXT's commitment to excellence, environmental protection and safety as well as its actual performance in both facilities over the course of the current licence period demonstrate that they are qualified to implement the activities outlined in this application. It is for these reasons that Women in Nuclear supports this application for a ten-year Class 1B licence for the continued operation of BWXT's Toronto and Peterborough facilities.

Thank you.

THE PRESIDENT: Thank you.

Dr. Demeter.

MEMBER DEMETER: Thank you for your presentation. A nice overview of sort of your perception of the workplace for women in this company.

I have a question that deals more with the fact that you have an organization in nuclear. Give me an example of how you explain the risks you are subjected to in your work to your neighbour who is not a nuclear worker.

I want to get a sense, a down to earth explanation of relative risk. If they say isn't it dangerous to work here, what do you tell them? How do you tell them? How do you put it in context?

MS McBRIDE: Lisa McBride, for the record.

Having worked in a number of different facilities throughout my career but primarily in nuclear, what I can say, what I tell people is it is the safest place I've ever seen.

Safety at any facility starts from the moment you drive onto the property at the parking lot, in terms of oversight on how we drive, how we walk, our attention to detail. We monitor our own personal activities but also the activities within the station.

We have the 14 safety and control areas that are monitored by CNSC staff, but we also have a number

of programs in place where we look at the number of barriers we implement to make sure that there is a safety protocol in place for pretty much every activity.

MEMBER DEMETER: So more specifically, there are jobs that you get designated to be a nuclear energy worker and you are exposed to slightly more radiation than background, that you would have been exposed to otherwise other than background. And if they say to you well, what about that little bit of extra radiation you get, doesn't that worry you?

How do you explain to them in your mind what that risk constitutes to you?

MS McBRIDE: So the risk to me is minimal. I get more exposure going on vacation to the Bahamas once a year. Well, I'd like to go more than once a year. But there is more exposure to radiation that occurs naturally in the environment than what we would see in the environment in which we work.

We have programs in place, high levels of training and safety protocols that every nuclear energy worker needs to follow. Just being on site even in an administrative role, we have requirements and expectations that staff are knowledgeable on radiation practices, any

time we're entering a station or a facility.

We have robust programs in place and they are satisfied. It's by far the safest place. I feel the safest at any one of our locations.

MEMBER DEMETER: Thank you very much.

THE PRESIDENT: Dr. Berube.

Dr. Lacroix.

MEMBER LACROIX: Yes. Thank you for your presentation.

I do have a question for you.

You go to the Prince of Wales Elementary School and you are asked to promote STEM. How do you do that?

MS McBRIDE: Lisa McBride.

I take a number of phenomenal women that we have working in our industry with me who can talk about the dynamic opportunities, the career, the learning, the training, the interesting work that we get to do and how we create an environment that is innovative where we contribute to bigger goals. Climate change I mentioned, which is very important.

STEM is a very good opportunity for any individual who is interested, particularly with women. And

there's space for everyone.

MEMBER LACROIX: Are you convinced of what you're saying?

MS McBRIDE: Am I convinced?

MEMBER LACROIX: Yes.

MS McBRIDE: Yes, I'm very convinced.

MEMBER LACROIX: I'm sceptical. I mean, if you show up at the school once a year to promote STEM, I don't know. I'm sceptical.

MS McBRIDE: Well, we have a number of role models that we promote, particularly in this industry. Actually, we have a number of female professionals that we profile in our organization. We have a number of executives at the engineering level and chemistry, environmental monitoring.

Our members report that they have high levels of engagement in their jobs. They are highly active. They enjoy where they work.

STEM is a very interesting opportunity for any young woman or any young person, with lots of opportunity in this particular industry.

I think we certainly would be interested in chatting more with this particular community about what

we do. It sounds like there's an opportunity for us to play a role in terms of what we see as opportunity.

MEMBER LACROIX: I'm not questioning your initiatives. I'm just saying that it's a challenge. It must be a double challenge, especially in this community right now.

MS McBRIDE: Yes, definitely, there's always challenges.

THE PRESIDENT: Dr. McKinnon.

MEMBER MCKINNON: Thank you.

I'm very struck by your very positive view of nuclear energy, and I contrast that with the point of view very equally and deeply held by a number of the other intervenors against nuclear power. And I'm sure it's not just a matter of being aware of safety or other educational factors or facts.

I'm curious. In your experience in your organization were you or any of your members ever very deeply sceptical of nuclear energy and do you have any comments on what caused the change of mind? Or has that never occurred?

MS McBRIDE: So for me personally entering this particular industry, I had a number of friends and

family who had worked in the industry so hearing what happens at a facility at different locations, safety protocols and opportunity, that removed my scepticism enough to join the industry.

What I've learned is that we are a transparent industry. We share lessons learned. We're highly focused on safety. Safety is a priority. And as I believe the licensee has demonstrated, safety is a priority in all areas and activities that they participate in as an organization.

I think for me personally that became clear very early in my activities in this industry.

THE PRESIDENT: In your written submission you talk about the goals of your organization, and the first one is making the public more aware around nuclear, the risks associated with that.

You have been here for a bit of time and you have listened to some of the intervenors and you have heard about their very deep seated concerns that they have.

Any thoughts on what your organization can do to help provide a different perspective to them?

MS McBRIDE: Certainly. Lisa McBride.

I would certainly welcome the opportunity

to discuss risks and benefits of the nuclear industry and radiation technology with any member, female or any other member of this community. I would be happy to set up opportunities for an open house type event where we can host something or we can provide the community with information that we as an organization have that is independent of the licensee or the Commission.

We would be happy to host an event to answer a number of questions.

THE PRESIDENT: Well, I see a number of very committed individuals out there in the audience, and you may want to check with them on how they would like that or if they would welcome that.

Thank you very much for your intervention.
Any final words?

MS McBRIDE: No. Thank you very much for the opportunity.

THE PRESIDENT: Thank you.

Moving on to our next intervention, it is a presentation by Ms Ruth Bishop, as outlined in CMD 20-H2.138, 138A and 138B.

Ms Bishop, the floor is yours.

CMD 20-H2.138/20-H2.138A/20-H2-138B

Oral presentation by Ruth Bishop

MS BISHOP: Yes. Thank you for having me here to present my concerns.

I'm a member of the Peterborough community. I've lived here for six years and I have a PowerPoint presentation.

Some of the information here, listening to other presentations I may amend or add to. I may not get through it either; I have so many concerns. But here we go.

I want to make clear my position.

I'm opposed to the granting of a ten-year licence to BWXT Peterborough that would include permission to produce uranium pellets at their plant on Monaghan Street in the heart of downtown Peterborough.

I'm also opposed to renewing their current licence for the next ten years, given community concerns about rising beryllium levels.

If the licence is granted, it should be for no more than three years, with agreement that a full environmental assessment and risk management study be

carried out by a reputable independent evaluator chosen by Peterborough's City Council.

There is definitely a feeling in the community that so much of this goes on far away in Ottawa, and it doesn't feel as though the local community has control.

Results of such an evaluation should be made available to the public and all stakeholders before any further action is taken regarding the granting of another licence.

Uranium dioxide pelleting should not be allowed at BWXT's Peterborough site.

So that's my position from all my research and being a member of this community.

My position continues. The BWXT Peterborough site licence should be separate from the Toronto licence so that local regulations and concerns can be addressed and applied.

Four, the BWXT licence condition should be subject to Ontario Ministry of Environment regulations.

I am naturally suspicious of many things. It's because I like to look at the bigger picture. I like to look at the international picture. Or even in Canada

here spearheaded by their provincial and territorial medical associations, British Columbia, Nova Scotia and Labrador have banned uranium mining because it is too toxic to human health. This despite the fact that all regions have considerable uranium ore deposits.

Quebec is under a uranium mining moratorium currently and will consider very soon a permanent ban.

The State of Virginia has banned uranium I think since 1986. Other states are considering this. And actually my research has brought up that the State of Washington has now banned uranium.

Let me just catch up on my sheets here.

The State of Washington has banned uranium. The Grand Canyon Watershed this year has passed the House of Representatives. Sweden in 2018 has banned uranium mining and the EU has called for a total ban of depleted uranium used in the production of products.

In terms of nuclear power, there is similar world reaction against it as well. Germany has shut down eight of its 17 reactors and pledged to close the rest by 2022. This isn't in your thing; I've just added this.

Italy voted a stay on nuclear. Switzerland and Spain have banned nuclear reactors and 15 other countries are opposed to nuclear power.

So I'm naturally suspicious when the world is turning its back, or at least many countries -- not the entire world but many countries -- are turning their back on uranium mining, on the supply chain which the licence is for that. The pelleting and all of that is part of the supply chain and the nuclear reactors themselves and especially the remediation and the disposal of nuclear waste.

This is the big reason why I'm naturally suspicious of getting another nuclear process in Peterborough, the pelleting process; not just the local concerns but also the international concerns.

I disagree. I don't think nuclear is clean. With all the transportation and the mining and the tailings, and we haven't solved the disposal problems at all. We're facing thousands and millions of years of radioactive waste. I don't agree that it's clean. I don't think it's a good alternative. I think renewables are the way to go.

Anyway, let's continue.

So in light of all of this, why are we considering letting milled, concentrated finely pulverized uranium into the City of Peterborough, into our very city core and a residential neighbourhood, just 36 metres from a junior playground, when the company admits there will be a significant increased emissions of such a dangerous substance, a Class A carcinogen?

If you can look closely at these photographs here, you can see this is the corner of the plant here on Monaghan, and this line shows the 36 metres to the junior playground at Prince of Wales School, which is the photograph over here. We're looking from this playground equipment back at the plant.

For those of you who may be visiting Peterborough for the first time, this is how close it is to the school.

I don't have children -- well, I have a child here but I don't have grandkids or anything, but I'm really, really concerned about the kids at the school so much so. I don't personally believe we can say it's 100 percent safe. We can't do that at all.

So please burn these pictures in your memory because this is how close the school is to the BWXT

plant.

My question here is the current operations at BWXT emit some levels of uranium but the pelleting process would greatly increase these emissions. I've used data here. I think other people have gone over it. I think I'll go on.

The number of times -- well, using data compiled from BWXT's annual Compliance Monitoring Report for BWXT's actual uranium emissions, the licence proposal includes major increases in annual emissions of uranium dioxide powder: airborne, 3,140 times more and waterborne 93,500 times more.

I'm concerned about this. I will continue to go on.

I'm concerned about -- this is why I think we should separate these two licences. In Little Lake we have this 250-foot high fountain that goes for six months of the year. The question our community has: Is uranium dust going to go into the lake and be spread around?

We have a huge music festival -- you can see it there -- all through the summer. For two months we have thousands and thousands of people attending that and the fountain is right next to it.

This is Peterborough; this is not Toronto. This is Peterborough. Is that fountain, that 250-foot one, going to spray uranium powder around? Will it be dispersed?

You can see pictures here. Just examples of local concerns that are site-specific.

There's a lot of acronyms used here with specialists. We have basic simple concerns.

My next point, which I'm running out of time for -- I will go quickly. This is BWXT in Toronto bakes 150 tonnes of uranium dioxide every month into pellets to be used in nuclear reactors across Canada. There's 700 tonnes of powdered uranium dioxide sitting on site at any given point. It also houses a 9,000 gallon tank of highly flammable liquid hydrogen.

In my last few seconds: Why are there not more protections? Why is there not more space between the community, schools and these what I consider to be dangerous items that pose a risk to the local community?

I see my time is up. I'll finish. Thank you.

THE PRESIDENT: Thank you very much.

Dr. Berube.

MEMBER BERUBE: Thank you for coming and talking to us. It's a pleasure to have you speak your opinion and share with us your concerns. We are here to definitely listen to all those concerns, because they need to be heard.

What I'm going to ask is what I hear you saying very clearly is that you are really not interested in seeing an expansion of operations in the Peterborough facility in terms of milling of pellets.

Is that correct?

MS BURTON: One of my points was that if BWXT is going to do this, move to a location where we're not near a major watercourse like the Ontonabee River, we're not in a community, it's not in a building that is over 100 years old. Move away.

And like my former presenter Christiaan Beyers, please let's look international. Why are those other countries shutting down their nuclear programs? Why are they doing that? I don't hear answers to that.

I know we have Canadian standards but how do they compare to international ones? Why is the uranium mining being shut down all over the place even though the -- Virginia has the largest uranium deposits in the USA

and it's been shut down since 1986. The watershed in the Grand Canyon, the House of Representatives just banned uranium mining, although President Trump has said he will not sign it into legislation.

There's a lot going on in the world and I'm not hearing answers to that here.

MEMBER BERUBE: Well, why don't we ask?

It's a little out of our mandate, that's true. I agree. Let's just leave that then.

I'm getting punky. It's been a long day. I think we're all getting that way.

Let's stick to your primary concern: the pelleting at the plant and your primary reasons why you don't want to do that.

MS BISHOP: I don't think you can say 100 percent that it's fair -- I mean that it's -- I'm getting punky too.

You can't say 100 percent that it's safe, in my opinion, in an industry like this. You saw how close it is to the school, and that playground is the junior playground, the kids that are most vulnerable to effects from any kind of radiation.

So, yes, I'm uncomfortable with it.

My daughter is here. She may have children. I may have grandchildren. I don't live far from the plant. She doesn't live far from the plant. No, I'm very uncomfortable with this.

I have to say that I'm very impressed with the community, like CARN and the people I've met recently who are doing a lot of research. Peterborough in my mind, especially being new here, is a special place. We want a safe community.

The amount of work that people are putting into these interventions. We had a late night session, to 1:30 in the morning -- so please be prepared -- at our City Council with many of us presenting our concerns.

Peterborough is a special place and I do not want to see a divisive industry doing something that is going to divide this community.

THE PRESIDENT: Thank you.

Dr. Lacroix.

MEMBER LACROIX: Thank you.

Thank you, Madam Bishop, for your presentation. Quite interesting.

One of the questions that you raise is does that mean that these tiny uranium particles will be

released by the fountain into the air rang a bell.

If my memory does not fail me, uranium oxide, UO_2 is about ten times -- has a density which is about ten times that of water, so if you release uranium oxide into water it will quickly sink to the bottom. So if it is released into sewage or in a sewer it will find its way into the bottom of the lake or the bottom of the river. So does CNSC in its IEMP take samples of water in silt -- you called it silt -- at the bottom of rivers and water?

MS TADROS: Haidy Tadros, for the record.

So perhaps I'll ask our environmental protection specialist to explain how water samples are taken and what we look at.

MEMBER LACROIX: I'm curious.

MS SAUVE: Kiza Sauvé, for the record.

So for the IEMP in Peterborough we take water samples. The IEMP is a risk informed program and based on the releases from the facility we have not taken sediment from the lakes, but we have taken water and we're seeing like no detection of anything in the water so, therefore, it wouldn't make sense to take sediment.

MR. RINKER: Mike Rinker, for the record.

If I could add to it, though. I don't

want to give the impression to anyone that uranium doesn't exist in the water; it does. It exists naturally. There's an Ontario drinking water surveillance program where it publishes data on intakes of water from across the province, and the values are low, but it's present. It's present in the air we breathe right now, today. All our life we're breathing a background concentration of uranium.

And it is present in the soils around the world and in Ontario, in the order of one to two milligrams per kilogram, so in the dust we breathe, there is uranium. There would be some uranium naturally occurring in that water. It doesn't -- it's not related to the facility.

MEMBER LACROIX: I'm not questioning the fact that there should not be uranium into the water. But, are you measuring at the right place in the sense that shouldn't you be looking at the bottom of the lake, in the bottom of rivers, instead of looking at water itself, or simply water?

MR. RINKER: Mike Rinker, for the record.

I just think that very, very low values of uranium are being released from this facility. We wouldn't expect any of it to be more than a few meters -- tens of meters from the facility.

We're not seeing it in accumulation in the soils near the facility. And we certainly wouldn't expect it anywhere farther away, in the water.

THE PRESIDENT: Dr. McKinnon?

Dr. Demeter?

MEMBER DEMETER: Okay, this will be a short question to open up for a longer discussion later, so just to sort of give you a sense where I'm going. Are there any other Class 1 facilities in Canada that have a single licence for an operation that is split in function and in geography between two sites?

MS TADROS: Haidy Tadros, for the record.

So you're hearing my colleagues in the back explaining the nuclear power plant licences that we have, so Bruce Power, Pickering. So the question that you're raising comes back to the one licence and whether there is, based on the authorized activities that we currently see, the structure of the licence, the way the compliance activities work, what we are looking at is the current licence for both facilities and the fact that it's under one licence doesn't take anything away from the compliance oversight and the management systems that are currently in place at this facility.

MEMBER DEMETER: Okay. So I'll leave it for discussion, but I will challenge that. Thank you.

MS BISHOP: Thank you.

THE PRESIDENT: But maybe now is the time to challenge that.

MEMBER DEMETER: Okay. So --

THE PRESIDENT: Because I have questions on that, too.

MEMBER DEMETER: Sure. I mean, the challenge is, unlike a nuclear power plant that's sort of one big sprawling boundary, you've got two facilities that currently do very different things. One does pelleting and one does more the fabrication of the fuel bundles. They're different risk factors, different safety scenarios, and they are in very different communities, and those communities have a unique footprint that they want to interact with that industry. So, I see that there is some economy of scale and efficiencies to having a single licence for both, but I also see from an accountability to the direct community and have this process unique to them versus a combined between Toronto and Peterborough, I see it perhaps being more grounded, if I could use that word, to the community they are in.

So I'm trying to get a sense of one versus two licences and why we would go one way versus the other?

MS TADROS: Haidy Tadros, for the record.

Maybe I'll start and then ask Dr. Ducros to compliment anything that I --

So the one licence came into being in 2010 as per CNSC staff's presentation and the considerations that were put before the Commission at the time were as what we have described in our presentation. From a licence perspective, the licence is authorizing certain activities and, yes, there are different activities that currently exist in the two locations.

The licensed authorization considerations at the time as per CNSC staff's presentation still exists today from the fact that not just efficiencies of how we do regulatory oversight, there is one management system. The programs at both facilities are the same programs that oversee it.

I don't want to discount the consideration for what the community's needs are and that is specific to the public information disclosure program which is under one licence and it is up to the licensee to look at what each of their community's needs are. But that is not

necessarily the defining factor of whether there should be one or two licences.

From CNSC staff's perspective, from our recommendations, we look at the licensed activities or the authorizations that are being looked at and we also look at the different programs that are in place so that when we come and present the information to the Commission there is a consistency and a comprehensiveness of looking at all of those programs together such that we can make a recommendation, but also such that we can do our own regulatory oversight and look at how the company is meeting regulatory requirements of the same program in two different locations.

So the considerations are there in the structure of the licence. We don't structure per location; we structure the licence based on the authorization of the activity, based on the entity that's asking for it. So we have an example of the Cameco fuel manufacturing, for example. It is one licence; they do different activities. It is one building, it's not two physically discrete locations. However, the licensed activities and the entity because of the programs has two different operations going on within one facility that is licensed by one licence.

So, perhaps Dr. Ducros can elaborate.

We have other sites as well.

DR. DUCROS: Caroline Ducros, for the record.

Thank you for the plan. And it is something we consider. I don't have a lot to add to what Ms Tadros said other than we're talking about sub -- sub-categories of one activity, right. In the end we are producing a -- in the end, what we are regulating is the production of a fuel bundle that will go to the NPP, so there are similar hazards.

A single licence doesn't take away from the ability for us to tailor certain aspects according to the activities, as Ms Tadros said. So like in the *Licence Condition Handbook* you'll see that there are different release limits for certain activities based on the processes that are in place in Toronto for the liquid effluent than there is in Peterborough.

It doesn't mean that the licence can't tailor for the specifics of that, but we do have one management system and for the programs in place across the facility, one person who is accountable at the end of the day. And from a CNSC perspective that provides a good way

of making sure that when we do regulatory oversight we're doing it in a very consistent manner. So those are the sort of advantages to the single licence, that we can -- we're overseeing the licensee. We're overseeing the licensee's programs that cross the two different facilities in a very similar way. And it is true, it does reduce some administrative burden and when you reduce administrative burden you also can refocus efforts on compliance verification.

MR. JAMMAL: It's Ramzi Jammal, for the record.

Dr. Demeter, I just do not want us to sound that we're defensive; we're having a -- we gave you a recommendation and you're requesting information pertaining to our recommendation.

I think it's time for the proponent or the applicant to tell you why they want one licence. But the specificity and the uniqueness of the site and its location must be addressed by the licensee, the same way they take responsibility for safety, so it becomes an issue from our perspective; I'm not going to repeat the detail. Is there is some administrative benefit for us as CNSC to reallocate the resources for safety element, for inspection? The

answer is yes. But we're providing you with the recommendation. The proponent will have to then convince you as part of the proceedings we have before you to determine what is their position.

THE PRESIDENT: So before we turn it to BWXT, I mean you've given the administrative advantage. You could still have one person look after two facilities under two separate licences. We're just trying to weigh that advantage to very different community needs, different risk profiles, because even though the end product is a fuel bundle the risks are very different, as we've seen, hydrogen at one, high uranium at the other, beryllium here.

And if BWXT were to transfer the pelleting facility here and if the CNSC were to approve that, again you've got one facility that may go through decommissioning and it's passing here. It just makes -- for me, I think it just makes the licensing very difficult so I'm really not convinced that the one licence is the optimal way of going.

And I mean, I know things have changed over time and staff has given their recommendation. I just think given the first part of the hearing we've had in Toronto, and now we're here, we're probably doing a disservice to both sides because we say, 'Oh, we're going

to cover that in Peterborough,' and then the folks here will say, 'Well, we really talked about that in Toronto.' So, it makes it very difficult.

I mean, I could say you know maybe with OPG, with Darlington and Pickering, they may have one management system, and yet they have two separate licences. But as an organization, as a company they -- for the most parts their management system is very, very similar.

So we'll turn it over to you and try to explain why one licence is the right way to go.

MR. MacQUARRIE: It's John MacQuarrie, for the record.

I don't think we came here today to make a recommendation to you about whether it's one or two licences, frankly.

THE PRESIDENT: So you don't care?

MR. MacQUARRIE: Well they're clearly related. You can't have one licence at one site and not a licence at the other site.

THE PRESIDENT: No, but how about two separate licences, is what we're saying.

MR. MacQUARRIE: As long as they're -- in the sense that they are connected, right. If we can't --

if we didn't get a licence in one location we won't be able to operate on the other site.

THE PRESIDENT: No, I understand that. But do you -- one licence for both facilities versus two separate licences. Do you have a preference?

MR. MacQUARRIE: My preference would be one because as it is today, because of what's been said already and I don't want to repeat that, and the tremendous burden that it places on us which does take away from all the other things that we need to do in our business.

THE PRESIDENT: Tell me, what's the tremendous burden?

MR. MacQUARRIE: Well this team and a bunch of other people are at relicensing efforts for a couple of years and so while we're doing that it is a distraction from the other things that we do in our business, and if we have to do that for two separate locations I suspect that will be more work.

THE PRESIDENT: Okay.

MS BISHOP: Can I have a last word?

THE PRESIDENT: Yes, it's yours now.

MS BISHOP: Unless there's another question.

THE PRESIDENT: No, it's over to you.

MS BISHOP: It's just the separate licences in my mind allow for the feeling of more local control because we do have -- Toronto has their City Council; we have our City Council, and City Council also has -- I know they're not --they are at the bottom of the heap, but there's some jurisdiction there as well for local conditions. And two separate licences would enable both City Council's to feel that they would have more participation and input, in my opinion, to this whole licensing process.

Thank you.

THE PRESIDENT: Thank you very much for your intervention.

Our next presentation is by Mr. Bill Templeman as outlined in CMD 20-H2.57.

Mr. Templeman, over to you.

CMD 20-H2.57

Oral presentation by Bill Templeman

MR. TEMPLEMAN: Thank you very much, Madam Chair.

Members of the Commission, colleague intervenors and members of the audience, first of all I'd like to thank CNSC and of course the commissioners for making this hearing possible. Meaningful public consultation is one of the pillars of our way of life, and so I'd like to thank you for being here this evening and listening to presentations such as this one.

While we may agree to disagree, at least we've honoured each other by showing up and attempting to understand.

Also, I'd like to thank you for your meticulously prepared documents, all the documentation that was sent out to the intervenors and for access to all the other interventions, and this was a big help.

First, some housekeeping. In my intervention CMD 20-H2.57 there's a typo on the last page, at page 4. It's small but it may be confusing particularly in translation. The last two lines at the bottom that read "cultural reasons. Social class exclusion makes BWXT's licence application an inaccessible process for them. Upscale wealthy neighbourhoods" and then the very next words "to" that shouldn't be there. So, it should be, "Upscale wealthy neighbourhoods do not get," so the "to"

should come out. My apologies for this oversight.

As this correction takes us to page 4, let me start there. I'd like to offer the CNSC some feedback on this community consultation process. As I describe in my intervention, preparing a written document then standing up and presenting before an audience speaking of that document is not great hardship for me. In my work I do this quite often. Whether I do it well or not is for others to judge but preparing a document and presenting it in public is no great barrier.

However, there are others for whom this activity is highly stressful and perhaps impossible. They do not have either the cultural capital or experience to participate in such a hearing. So, I would like to recommend to the CNSC that they consider augmenting future hearings with community surveys, online surveys, door-to-door canvassing, and pop-up opinion gatherings in public locations such as shopping malls, grocery stores, etcetera. The operating principle behind this approach would be: Go to where the people are, instead of make them come to us.

Next, I would like to refer to supplemental CMD 20-H2.B and this is the supplemental in

which the staff responses to key concerns and issues received on the BWXT relicensing application.

I have excerpted four entries when CNSC staff responded to an issue I raised in my written intervention and I have numbered them, so we'll go over my -- so my remarks will be in context.

Before I get there, though, what I would like to do because of time constraints is get to the point that was not -- which was mentioned in my intervention yet staff -- CNSC staff did not comment on, and for good reason.

Let me elaborate. Almost everything discussed in this hearing falls under the domain of science. Radiation levels, contamination, toxicity are all subjects of scientific analysis and scientific interpretation and as they should be. CNSC of course has a great deal of expertise in this area.

But there is one area that is not subject to the laws of science or even can be studied through scientific analysis, and that would be future real estate values.

I'll quote from my intervention:

"Nothing untoward may ever happen at

BWXT''s plant. There may be no radioactive contamination of the surrounding neighbourhood."

As a resident living six-tenths of a kilometer away from the plant, that would be a wonderful outcome.

"Yet in ten years if the market perception is that this neighbourhood is contaminated or unsafe..."

We've heard a number of perceptions this evening:

"Our properties will be worth much less than they are today."

How much? It's hard to say.

"Manufacturing processes and environmental contamination are both physical processes and subject to the laws of science. [However] property values, particularly property values in neighbourhoods deemed to be of questionable safety, are subject to market forces and the laws of perception, not the laws of science.

[So,] Apart from selling now and moving, what can homeowners in the neighbourhood of this plant do to mitigate this financial risk? BWXT or the Canadian Nuclear Safety Commission (CNSC) are not in the real estate business. [I understand that.] Neither organization will be compensating me for any loss in property value."

Now, for my wife and myself, we've done everything right for our house. We've managed to pay off our mortgage, replace the furnace, put on a new roof, pointed the chimney, and our children know that when the time comes that we need extra care in our extreme old age, if we get there, the money is in the house. Sadly, here is not a yacht up in Collingwood or Pony's in Caledon. The house is more or less where the bulk of our financial security is.

Now I have to admit that this is hardly a desperate situation.

"There are many, many people in Peterborough who will never own a

house like ours, and so this is very much "a middle-class" problem. But it is my middle-class problem, [or I should say my family's.] The mere existence of this nuclear manufacturing plant close to my house could seriously erode my property values. Once BWXT gets its licence renewal from the CNSC, we will have no voice whatsoever."

So, my understanding is that the qualifying property owners in Port Hope will be compensated by the federal government for loss of value of their properties due to contamination of their neighbourhoods by decades of nuclear processing. I understand that's a totally different situation from what we're facing here.

But is such a plan possible for the neighbourhood of BWXT? Again, this is not an abstract academic study. There are hundreds of property owners within a kilometer of the BWXT plant. Suppose our property values fall who will compensate us? Is this nimbyism? Absolutely.

A few questions on that theme. As there

are financial consequences for neighbourhoods and communities has the CNSC explored the possibility of acquiring licensed applicants to post sufficient investment vehicles to cover future liabilities? What levels of insurance will BWXT be carrying to cover negative financial outcomes such as neighbourhood property value losses? And what would it take, I guess in a macro sense, for CNSC to work with BWXT to consider an alternate location for this pelleting operation? I don't mean another city, but a remote location.

And now if I can go to the large picture. As a canoeist I have paddled through a fair bit of Northern Ontario and Quebec; there's lots of empty land up there.

Now, would I pay more for my electricity to fund such a transport of the production facility to a more remote location? Of course I would. But was that ever on the -- on the offer block?

Getting back to the reference document or, rather, the staff comments on the intervenor comments -- I realize I have a minute left -- I just highlighted four and I will quickly skate through them if I can.

In comment 9, there are differences in specific cancer rates throughout Peterborough and Ontario

may be explained through other cancer risk factors such as smoking, lung cancer, overweight, obesity. That just boggles the mind in that Peterborough has more smokers, more overweight people than other -- and that explains our difference. It just didn't flush with me.

Also, the tone is that CNSC staff assesses that there will not be any increases in cancers within the community as we do not see an increase in the likelihood of adverse health effects. That seems to be an opinion posing as fact.

I have a few other observations, but time is running out, so thank you for your time.

THE PRESIDENT: You know what, take a couple of more minutes and tell us about the other three points in the staff...

MR. TEMPLEMAN: Thank you.

Well, at point 30 the comment is that ERA or impact assessment should be provided for the protection of the environment and health and safety of all persons. I'm reading here from the CNSC staff comment:

"The public and environment surrounding both the Peterborough and Toronto facilities are protected.

CNSC staff conclude that the emissions from these facilities do not pose a risk. For additional information please see response 33."

(As read)

What I am missing in these responses -- and I appreciate they took a lot of time -- is there are very few citations or references. In other words, statements are made without a resource to follow up on the veracity.

Next comment, concern over liquid hydrogen use. The sentence I have bolded is as follows:

"CNSC staff..."

I am quoting from what CNSC staff included here.

"CNSC staff agreed with BWXT's conclusion that the likelihood of an explosion is unlikely to happen."

(As read)

Again, years ago I used to do a bit of rock climbing with a climbing rope. If this were a conference, you were the manufacturers of climbing rope and you told me, "Mr. Templeman, our rope is tested,

guaranteed, I can assure you it could cope with the fall of a 300-pound person over 100 metres, go climb on it", I'm the climber, you're the vendor, who is taking the risk? In other words, the risk -- the statement is written, but the recipients of the risk are the neighbourhood members.

My last one is remark number 96 regarding having historic contamination issues like Port Hope. The CNSC remarks are:

"In addition, releases from modern-day nuclear facilities are extremely low and the surrounding environment is continually monitored to confirm the public and environment remain safe."

(As read)

Again, I am missing I guess more detail. I am told to go away and be safe because it's safe. As the people who are going to be on the recipient of the safety monitoring, I am missing some details. Again, I am not accusing anyone of chicanery or not doing their job, but it's the neighbourhood close to BWXT that is taking the risk and we are asked to accept these things, for those of us without the extensive scientific backgrounds of the

front table and in the room, to trust and what do we have to go on?

Thank you.

THE PRESIDENT: Okay. Thank you.

So before I open it up for questions, I just wanted -- in case you want opening remarks, your concerns about the property values dropping or making BWXT move their facilities to a remote location, it's not within our mandate to look at. And your comment around the higher cancer rates in Peterborough and what may be the reason for that, the Peterborough Medical Officer of Health is going to be here with us tomorrow and we will save that question for that.

But we will open it up for the other points that you have raised and we will start with Dr. Lacroix.

MEMBER LACROIX: Thank you very much, Mr. Templeman, for your statement. Quite interesting. Of course you have raised a number of issues that we are still addressing. We have been examining these issues this week and we will continue to do so until Friday night.

I will focus on one interesting recommendation that you make in your conclusion and I will

read the text. You recommended a two-year licence instead of a 10-year licence and the rationale behind it, and I quote you:

"...if radioactive contamination is detected in the neighbourhood, an exposure of 2 years would be significantly less damaging than an exposure period of 10 years."

When I read this sentence I was under the impression that a 10-year licence is a 10-year free ride. So could CNSC reply to this? Could you provide some explanation on a 10-year licence? Is it a free ride?

DR. DUCROS: Caroline Ducros, for the record.

The licensing period does not take away from the compliance verification aspect. If it is a five-year licence or a 10-year licence or a 20-year licence, our compliance verification plan will be rigid and carried out. We have a risk-based approach. We look through all 14 safety and control areas. We do it based on the risk of the facility and the activities there.

So I don't know whether we want to bring up the slide, but when I spoke about it in the

presentation, I talked about the level of effort that goes into the compliance verification of BWXT per year is equivalent to about 1.5 full-time equivalent employees and that includes desktop reviews, reviews of data, reviews of the environmental compliance program and annual compliance report. It also includes the inspections.

If at any time we feel that there is a deviation from any of the programs, any action levels are exceeded for instance and we get notification, we look to having the licensee do corrective actions and we assess whether those corrective actions are good enough.

Another thing about the licence period is that there are other controls in place that cannot be put aside. For instance, we spoke earlier that the environmental risk assessment, that is based on a five-year cycle. It has to be reviewed every five years in the context of what is going on now. However, if there is new science, that would mean that the environmental risk assessment has to be renewed earlier and then we have to review that and accept it.

The safety analysis report, that is another report that we require to be updated every five years. If there is any reason based on inspections where

we feel like something has to -- an additional control barrier needs to be put in place for whatever reason or a program needs to be updated, we will require that.

So the licensing length is not -- it's independent of the compliance verification that we undertake. The compliance verification is based on the activities and the risk.

MEMBER LACROIX: Okay. So for a resident --

MR. AMALRAJ: Julian Amalraj, for the record.

MEMBER LACROIX: For a local resident, a 10-year licence is as safe as a two-year licence? This is what you mean?

MR. AMALRAJ: Julian Amalraj, for the record.

I just wanted to put two points to put perspective to what the practices internationally are.

Currently, in the United States or internationally, most of the nuclear fuel facilities are perpetually licensed, with continuous compliance verification processes, with periodic safety reviews, and irrespective of what the licence periods are, in terms of

the compliance verification side, the inspection and the inspection program and the inspector are authorized and they can issue orders if there is a health and safety issue immediately. There are provisions in the *Nuclear Safety and Control Act* to act immediately if there are any concerns associated with health and safety of persons or the public. The period has nothing to do in terms of how we enforce or how we ensure safety of the public.

THE PRESIDENT: I think in sort of simpler terms what you are saying is a 10-year licence does not mean that you're guaranteed that you can run for 10 years, you could be shut down the following day if you're not performing as expected?

MR. AMALRAJ: That's right.

MS TADROS: Haidy Tadros, for the record. That is absolutely right.

THE PRESIDENT: Dr. McKinnon...?

MEMBER MCKINNON: Thank you for your comments.

In reading through your intervention and listening to your presentation here, it makes me think we have a communication problem. We have talked about, you know, the communication issue between the company and the

community, but I think there are some words that are being used which are creating some doubts for you. Two of them that came up quite a few times are "risk" and "safety" and risk management and how are we safe and, you know, trust us, and so on. I think in general use these terms, they are used with a certain understanding, but in the world of science and engineering they have very precise meanings.

So I would just like to ask staff if they could give very concise statements about what the meaning of "risk" and "safety" are to explain a little bit about how those words are used in reporting the hazards.

MS TADROS: Haidy Tadros, for the record.

I will start and maybe my colleague Mike Rinker might want to add.

So from a regulatory perspective when we look at risk and how we assess and mitigate risk, we have always heard and talked about risk as being the probability of something happening and the consequences should it happen.

So from that perspective and when we say as staff risk-informed, what we say is we look at and assess the hazards based on how likely is this going to go wrong and if it does go on, what is going to happen, what

are the consequences to that. So there are methodologies, there are numerical calculations, there are deterministic approaches, there are probabilistic approaches to kind of bring that whole image of risk into perspective when we look at risk.

Safety, on the other hand, safety is judged. Safety is looking at all of that risk, being able to step back and consider with regards to the information that is presented, the assessments that have been done, how safe is something is a judgment.

And perhaps my colleague Mike Rinker might be able to add a little bit more.

MR. RINKER: Mike Rinker, for the record.

So interesting question, to really differentiate risk from safety. I think when CNSC staff do their evaluations and determine whether a project would be reasonably something that we could recommend for approval, we look at the risk and the relative risks and we want to make sure that there are sufficient margins. We understand that there's uncertainty in calculations, there's uncertainty in predictions. Surveillance and monitoring must be required to verify, and so we look at sufficient margins of safety or you could say that we use the

precautionary principle in fact where there is -- you know, we understand that there is a level for which above that there is evidence that a risk would be imparted, we want a factor of 10, a factor of 100 and then apply the ALARA principle to minimize the risks further to as low as reasonably achievable. For all of that to happen, then we could recommend that the project would be a safe project to proceed.

THE PRESIDENT: Dr. Demeter...?

MEMBER DEMETER: Thank you for your intervention.

Yes, we will be probing the health risks relative to cancer rates when the Medical Officer of Health can talk about that.

I do want to share with you that you, as many intervenors have, but more specifically you have sensitized us to the role of the intervenor and the experience of presenting before this quasi-judicial rather official kind of -- and that we have to be cognizant of that and try to make it as comfortable and to be frank, informal and smooth as possible. So thank you for sensitizing us to that again.

THE PRESIDENT: Dr. Berube...? Okay.

Mr. Templeman, any last words?

MR. TEMPLEMAN: Yes. If I may, there was a sentence that I did not read out and I will be very brief.

"CNSC staff..."

These are CNSC words.

"CNSC staff assess that there will not be any increases in cancers within the community as we do not see an increase in the likelihood of adverse health effects at such low doses." (As read)

Now, as a Montrealer, each October I make a predictive statement. This is a predictive statement. My predictive statement each October is "Les Canadiens are going to win the Stanley Cup." I have been wrong for 26 years I think. All I'm saying is that a predictive statement from the CNSC has a lot of weight. The CNSC has a lot more weight to make such a prediction about cancers and radiation, and so on, than I do about the Habs, but it is predictive, it is happening in the future and none of us know that.

Thank you very much.

THE PRESIDENT: Thank you for your intervention.

Our next presentation is by Dr. Julian Aherne, as outlined in CMD 20-H2.244 and 244A.

Dr. Aherne, the floors is yours.

CMD 20-H2.244/20-H2.244A

Oral presentation by Julian Aherne

DR. AHERNE: Thank you. Thanks for the opportunity to speak and I think especially now that we are into overtime, so I can understand that you must be tired. I am also tired, but thanks very much.

I would also thank Louise for her great organization skills.

In terms of what I will cover, you have seen the report, so you have read that stuff. So essentially I will try and give a summary now of what I have covered in my intervention and I will summarize it down to about three recommendations.

I will also add a few extra comments. I know there have been some more recent reports, so I will try and make some responses to those recent reports, but I

haven't had a lot of time to read them.

I should also apologize that I wasn't here this morning, so I missed a lot of topics that may have already been covered and so I may have to go through some of them again. I apologize.

But what I will try to focus on I think are a few gaps that I have seen in the recent reports and I think some limitations to science-based decision-making. So I will try and address those.

First and foremost, I would like to say that I am a fan of the Independent Environmental Monitoring Program. I think it's a good program. I believe it was a different incarnation of the hearing that first recommended that the program should exist, so I think it's a good program and I think there should be more of it.

What I will do is I will just go through some of the attributes of what I believe to be the attributes of the IEMP so that we are on the same page and I will make a few statements about them.

So with respect to the program, it is a site-specific program, i.e. they go and select some sites and typically focusing on publicly accessible areas.

I think to note about that is that in the

business it's called a judgmental sampling design, so it's not based on a probabilistic or a random approach. So it limits the statements you can make with respect to the full exposure to the population. It's not a census in any way. So it's a judgmental one and so there has to be some care with respect to how you interpret those results.

Secondly, of course, it's a program that's limited with its time in each jurisdiction. So it has a very limited air sampling program and it's important to recognize that, I think. So, for example, in 2014 they came in and sampled for about five or eight hours in Peterborough at one location. So it's important to consider representativity.

You know, by way of example, if you were to ask me a question but only gave me the first letter, it's very hard for me to interpret what that question is going to be like. And it's important outcomes that come about -- or that come from CNSC staff that say we have monitored the air, there is nothing to worry about. It's unfortunate they are not followed up with respect to the representativity of that data. And I think I have just recently heard a statement about water as well. One water sample isn't representative. So that's important to note.

However, there is repeat sampling in a number of locations and that has a lot of value depending on the media that's sampled because of course you can build a trend over time and understand or monitor changes over time. And that's very important.

Of course, with respect to what I have recently said, statements such as verified, the public and the environment are safe, a little bit difficult. I think there needs to be a consideration of what those statements can -- you know, what you can really say with that data. So I think that's important to note.

But a strength that it does have of course is it can be used as something that is complementary to this verification program that's in place. For example, I might, you know, suggest that if you saw an increasing trend for example in some component of an environmental media, that would be a point to look at the verification data from the emission stack and say, hey, we see an inconsistency, we should pause. And that's how the program should work and how it should be used.

Ideally, where it should be used of course is to compare against other environmental monitoring that has been carried out in the jurisdiction so you can compare

the independent monitoring to perhaps monitoring carried out by the proponent.

Unfortunately, in Peterborough we don't have any environmental monitoring outside the fence line, so there is nothing to compare against. That said, it also means that we have a lot of value in that IEMP data. It's the only environmental data that exists outside the fence line.

So with respect to the first recommendation, I think the IEMP data is quite important for Peterborough. It is good data, the data should be used, but there should be -- you should ensure greater accuracy with using that data.

So I focused on the IEMP data and did some analysis of that data. In terms of the data, we have heard this already, of course they came in and there were surveys carried out in 2014, 2018 and 2019.

I looked at that data, the air data. Given that it's not representative, it's only a few short periods of monitoring, it doesn't really have value, so I didn't look at it, I threw it away.

The same with the water data. Again, one or two graph samples, it really isn't representative and

you can't say much about it, so I didn't look at that.

But there was soil data and that had value in that it was repeated sampling at a number of locations over those three periods. It is important to recognize that soil is monitored not because it is soil but in a sense it's an indicator of changes in the atmosphere. It's a poor man's air monitoring equipment. If you can't be there for the entire year to monitor the air, then if you sample the soil, you have some sense of the accumulation over the period since you last monitored.

So it's important to recognize that soil has value as like a biomonitor, an indicator of changes over time within a region. It's a passive monitor, it accumulates atmospheric impulse.

As you have probably heard already, based on the dataset, there is a statistically significant increase in beryllium in the soil. And I recognize and I fully understand it's a limited dataset. I fully understand its uncertainty. Soil data is often very noisy. Notwithstanding the noise, there is this statistically significant increase.

And I think what is important to note is that there has now been some data published in terms of the

uncertainty within those datasets and I agree there is uncertainty in that data, but it's quite a difficult challenge to see the increasing trend. We see this trend increasing over time and, irrespective of natural variation or variation that might happen over time, it's happening in one direction here and it's happening for beryllium, but not for uranium. So there is obviously something somewhere in some process that is different between the two of them.

Some simple source receptor analysis looking at -- assuming that BWXT was the source, looking at each of the receptor sites, the soil sites, counting the frequency of wind and the direction of these sites shows that -- or suggests that BWXT is the likely source.

And again, some further simple calculations looking at air concentrations that would be needed to force that change in the soil based on the observed data, just based on the observed data, suggests that air concentrations likely had to exceed limits for that accumulation to occur.

I really liked the way somebody brought up just there from CNSC staff this idea about likelihood and risk. Of course, based on the data, the likelihood is quite high and the risk is quite high. So I think they're

in the red box for high likelihood, high risk. High likelihood, high risk. Yes.

So based on this, again, I came to the recommendation that of course based on the observed IEMP data, it would be inappropriate to proceed with the licence renewal. I have some suggestions about extending the current period for a number of years to evaluate the trend, but really it's the trend that we care about here. I've seen a number of responses that have ignored the increase in trend but only focused on the levels in the soil. And it's really not the levels. The levels aren't the concern, it's the increasing trend over time. That's the issue.

In the interest in time, I'll go quickly through this slide. We have uncertainty because we don't have an environmental monitoring program in place. And clearly if we had an environmental monitoring program in Peterborough, we'd have some information on contaminants in different environmental compartments. We could use that to determine a fix. It could be used as a secondary score to the emissions monitoring. And again, it could be used to build some community engagement.

So I have a recommendation that of course there should be an environmental monitoring established in

Peterborough that's something different than the program that is talked about where they come out and do some monitoring before pelleting. There should be a well-established environmental monitoring program in Peterborough.

And I think I would suggest to the hearing that in a residential neighbourhood, it almost should be a standard that all facilities, irrespective of the level of emissions or the perceived level of emissions, they should have a monitoring program in place.

In my last 35 seconds I could make some suggestions -- I'll try and make some suggestions to the attributes of what an environmental monitoring program should look like.

Emissions to the air are the key, so there should be air monitoring. There should be at least two monitoring sites in Peterborough, given that the school is close by. There should be an air monitoring site in Peterborough. Should be one downwind.

Ideally, they should monitor with a 24-hour integrated sample, given that the licence or the standards for the province are the 24-hour integrated sample. Of course, that's a significant cost. They'd

rather do a weekly integrated sample, but they could follow the federal program of one in three days, et cetera.

You can only monitor two places given costs, so of course there should be a soils program. A soils program, again, should be at some number of sites, more than eight. It should be repeated over some frequency. And so that's so you can build an understanding of the spatial changes.

Water of course, there is some emissions to the sewage, sewer system. That goes through the wastewater treatment plant. They have a good monitoring program in place, and I think some liaising with them could help to improve that. But of course that is then sent out into the Otonabee, so it would make some sense to have a further water program, monitoring program, monthly basis.

And I liked the suggestion of sediment sampling as well. I think that's a good suggestion. Again, these won't be the minor -- they could be minor parts, but I think air is a key part of that.

I also believe that there should be really strong engagement in the community. This facility is in the middle of a residential neighbourhood. There is the suggestion of a community liaison program, which is good,

but really I think this type of program should focus on engaging the community with the development and building of that environmental monitoring program with continuous engagement in terms of results and sharing.

And lastly, we see this trend and it's hard to understand. There's limited data. So clearly it needs further monitoring. And it's not one-year sampling. I've seen a couple of things about, yes, we'll sample for one year, and I'm kind of asking the question why. It's the trend we care about. And so it's taken three periods of monitoring before we can assess and say, yeah, there's a statistical trend here. It takes another three more years before we can verify that this trend doesn't exist. So I think it'll take some time before you can actually sign off and say, Oh, there is no trend.

Thank you.

THE PRESIDENT: Thank you very much.

Dr. McKinnon?

MEMBER MCKINNON: Thank you very much for your intervention. I really enjoyed reading your report and I appreciate the effort you put in preparing the graphics. That helped to interpret a lot. I really liked your composite of the different types of data, wind, and

the locations.

And I completely agree with you. You know, the monitoring is very important and to have sufficient robust data to make, you know, reliable interpretations.

And so one word stood out a lot. It was "representivity." You know, how representative of what is really happening with the contaminant levels are these samples? And you know, there are many, many factors that will be influencing the soil concentrations. One was mentioned earlier which I was interested in, which was the time of year. You know, that can affect how dry the soil is, how it may have been leached with water, how the rainfall has been at different times, the depth at which the soil is sampled, the type of soil that is there at any given point and how that may vary over a site, what the surface use is, how that soil is becoming compacted and how permeable it might be -- many, many factors involved, you know, all of which can lead to uncertainty, which would be amplified when you have a small number of points.

So you made me look more carefully at the data which is published on the CNSC website. And of the data set for the soil beryllium, for example, which we've

focused very much on -- and I could refer to slide 30 on CNSC's presentation, which shows that graph. So here we see the points are fairly -- they show a trend just by eye. As soon as you look at that, you can see a trend, and there's an outlier. However, if you look at the individual data points, the sampling points, there are seven locations which were sampled in all years, and those are 2014, 2018, 2019. Five sites show an increasing trend, and two are decreasing. So it's not always -- it's not that clear when you start to dig.

So considering all of the factors, what struck me is again getting back to this representivity, is how deeply can we interpret that data? Are we trying too hard to interpret that with too little, considering all the factors?

So the question I would like to address to CNSC about this is, you know, when we do detailed data analysis, we might put error bars on, although that hasn't been done, and there's not a lot. But considering all those other factors, what is your estimate of the noise that might be contained in these, and are we trying too hard to see a trend, and how could we improve that?

MS SAUVÉ: Kiza Sauvé, for the record.

So I'll start and talk about the error bars. We have from the lab their analytical uncertainty, and we've put that on the slide. And so as the lab improves on their analysis of beryllium, that uncertainty has gone down.

So we actually tried with that graph to make it as public-friendly as possible and not make it an error-bar chart, because we've had feedback before, actually, that when the public sees that it's very confusing. So we try to include the uncertainty on the slide.

But in terms of improvements, we'll pass that on.

MEMBER MCKINNON: Before you go, I'm not talking only about the analytical uncertainty and the error bars in that. I'm talking about the cumulative errors and all the many other factors with sampling of soil, considering that it's a, you know, real, highly variable material and all of the factors that will effect the uranium concentration in it. Yeah.

MR. McALLISTER: Andrew McAllister, director of the Environmental Risk Assessment Division.

I'll key on your point about, you know,

are we trying to interpret too much into this data. And I'll use the intervenor's submission to help illustrate some points.

For example, he had -- the intervenor had put together the wind rose of predominant wind directions and overlaid the sites on that. What's interesting in that is one of the sites, the school site specifically, does not sit within a predominant wind direction. So here's where we get to the notion of how much interpretation do we do into the data.

Then we look at a reference site. The reference site of 1.25 milligrams per kilogram falls within the range of most of the other sites, and we'll park the school site as being the exception.

So likewise, and I want to echo what the intervenor says, there is a trend. We do care about the trend. But we're not equating the same level terms like "high risk" in those sorts of aspects. We're seeing results that are within background.

It's not the CNSC that's come up with the background number. It's a Ministry of Environment Standard that is used, that looks -- that is derived from areas not impacted by point sources, and it represents a sort of an

upper typical range.

And from CNSC's perspective, when we're looking at soil results that are below that range, it's we're viewing it as background. If something were to be above that, then one might be able to infer it's being affected by some sort of point source.

So those are just some initial --

THE PRESIDENT: I'm so sorry to cut you off --

MR. McALLISTER: Yeah.

THE PRESIDENT: -- Mr. McAllister. We do have a hard end at 10:00.

MR. McALLISTER: Fair enough.

THE PRESIDENT: We're going to lose some very critical people at 10 --

MR. McALLISTER: So -- okay.

THE PRESIDENT: So we'll continue with the questioning tomorrow, and you can continue with your response. Because I do want to give Ms Griffin a chance to make her --

MR. McALLISTER: Okay, sorry.

THE PRESIDENT: -- presentation. And you've raised a whole lot of questions which we will ask

tomorrow.

DR. AHERNE: Can I just make one comment?

It's very unusual that the uncertainties go in one direction. So yes, I mean, it's a lot of variability. And it's really, really hard to see that trend. I mean, I've looked at a lot of soil data over the years, and it's very unusual to see this trend. So you know, there's something there that's odd. Yes, we all know that one site's an outlier but anyway.

Thanks.

THE PRESIDENT: Thank you very much.

Our next and our last presentation for today is by Ms Lara Griffin, as outlined in CMD 20-H2.82.

Ms Griffin, the floor is yours.

CMD 20-H2.82

Oral presentation by Lara Griffin

MS GRIFFIN: Thank you. Good evening, President Velshi and Committee Members.

I'm here to present my objection to BWXT's licence application to conduct pellet production in Peterborough.

According to the CNSC regulatory fundamentals, it is the CNSC's responsibility as regulator to prevent unreasonable risk. Due to the location of the BWXT site -- which is, as you know, 30 metres away from an elementary school and many homes -- the proposed activity poses significant and unreasonable risks to the health and safety of Peterborough citizens. The proposed activity is not appropriate for this location as there is no buffer zone if something were to go wrong.

I contacted the CNSC and BWXT to request the emergency response plan for the Peterborough facility. I was told that the documents are not provided to the public and that summaries of the plans were posted on the company website on March 1st. It is unfortunate that this information was not posted prior to the deadline for intervenors in January.

The document details the roles of BWXT staff in declaring an emergency and communicating with staff and emergency responders. It is entirely focused on emergencies occurring within their facility. There is only sentence that pertains to emergencies affecting the community, which is referred to as a "site area emergency":

"A site area emergency is an incident

that has led or could lead to a significant release to the environment of radioactive or other hazardous material and that could have off-site consequences requiring response by an off-site organization to protect persons off site." (as read)

Notably, there are no roles or responsibilities tasked to BWXT in that sentence, only that an off-site organization will need to protect persons off site. The only instruction provided in the plan is that the CNSC must be notified within 15 minutes of declaring the emergency.

This leaves me with a lot of unanswered questions about what will happen after that phone call. For example, who decides if the students and staff at Prince of Wales Public School need to be evacuated? Where would they go and how would they get there? How will these instructions be provided to the school? Will the kids need to practise evacuation drills?

How will residents be notified? I live in the community. How will people let me know that an

emergency off-site event has occurred? How will it be determined whether it is safe to return?

How will contamination be cleaned up? Would removal of topsoil be required? What radius from this facility would need to be evacuated? Would it depend on wind direction and speed? Who would be responsible for remediating the neighbourhood and who would pay for it -- if remediation is even possible.

These are a lot of questions, but they're valid questions.

We've been told to rest assured that there is no risk to the community. But I don't understand how you've arrived at the conclusion that the risks to the community are acceptable.

So in order to evaluate the acceptability of the risk to the community, one needs to identify the worst-case scenario and describe its consequences. So far we've been told that as long as everything goes as planned, we should be fine. But what if things don't go according to plan? I would like to know what worst-case scenarios were considered. How can we have confidence in the regulator and the licensing process if this risk assessment is not publicly shared? We are the people who would be

affected by the consequences of an emergency, but we have been excluded from the conversation. The documents are not provided publicly.

In terms of financial costs of an accident, obviously there are immediate costs of evacuation, short-term costs of relocation, cleanup, testing, long-term costs of monitoring ongoing exposures and health indicators. These costs must be multiplied by the number of people affected.

Does the CNSC know how many people live within two kilometres of the site? How many people go to school and work within that radius? Some estimate the number at 12,000 people. I don't know what the number is. But if the CNSC does not know with accuracy how many people live and work within that two kilometres of BWXT, how can you calculate the financial costs of a catastrophic event?

I read that BWXT has a \$48 million financial guarantee and wondered if that money could be used for accidents as well as decommissioning. The CNSC response to intervenors states the money set aside for decommissioning cannot be used for other purposes. So if that's the case, what funds are available to cover the costs of responding to an accident? This is not mentioned

in the emergency response plan. It states that an off-site organization will respond to protect persons off site. So I'm wondering how the CNSC can be sure that citizens and government will not be left to cover these costs as has happened historically.

The dominant messaging from BWXT and CNSC is that emissions will be within allowable levels and will be monitored. Monitoring provides no reassurance. Telling me after my exposure that the levels were exceeded or that in retrospect the levels were not safe will not help me. Impacts to our health cannot be reversed and contaminated soil and water cannot be fully restored. The time to employ the precautionary principle is now.

We've had a major problem with flooding in the city of Peterborough in recent years and may experience more frequent and more intense flood events with climate change. As rainwater leaves the site, both overland and through underground drains, contaminants will leave the site in that rainwater and flow into Little Lake where children swim at Beavermead Beach. Extreme weather events are likely to significantly increase the amount of uranium powder that leaves the site beyond the monitored emissions through air and water.

In 2018, thousands of times more uranium went into the sewers from the Toronto facility than from the Peterborough facility. This indicates that a significantly larger amount of uranium enters the watershed through the act of pelleting. Have downstream communities been consulted by BWXT about this proposal? These stand to be impacted by contaminated drinking water.

To conclude, I'd like to return to the CNSC's responsibility to prevent unreasonable risk. If the equivalent federal regulator in United States does not permit pelleting facilities to be located in residential areas, how is it reasonable to do so here? In response to an intervenor who asked whether the CNSC uses IAEA safety guides when reviewing applications, "specifically when siting nuclear facilities," the response provided was yes, the CNSC considers those safety guides, "both facilities have been in operation since 1965."

In reading this, I'm wondering does the response mean that because the site is already in operation that the CNSC does not see itself as being involved in the siting of the proposed pelleting activity? Because the CNSC is in fact making a local land use decision here, because the City has no approval role given the historic

zoning designation from 1892. The BWXT site would not qualify for the zoning required for the proposed activity if considered today. Manufacturing nuclear fuel is not a compatible land use in a residential neighbourhood.

While BWXT's operations may be guided by safety protocols for handling hazardous materials, accidents happen. If they do, the consequences will be severe for many people in this neighbourhood and for the city as a whole. Approval of pelleting at this location would present unreasonable risk to the community.

I encourage the CNSC to deny the request for pelleting in the licence application and in future I encourage the CNSC to require a more accessible consultation process to take place that is informed by independent studies of emission levels of this activity and the impacts on human health and to look at international studies of appropriate buffer distances.

Thank you.

THE PRESIDENT: Thank you very much for your intervention.

We do have the Peterborough fire chief or his staff coming here tomorrow evening as well as Friday morning, and so questions around emergency preparedness,

emergency response, we kind of save it 'til then.

BWXT in their presentation did talk about the worst-case scenario, and if I recall it was a catastrophic fire and maybe a structural collapse. And we'll get into that.

They talked about insurance, but we'll cover that again as to what's covered and what kind of protection do residents have.

And we'll also get into the siting requirements and what does that mean for adding the pelleting to this and how does that compare with international standards.

So we will do a quick round of questions, but we'll save some of those for either tomorrow or Friday. So why don't we start with Dr. Demeter.

MEMBER DEMETER: In the essence of the time, I'll let you know what questions I will be asking, because they're going to take some considerable discussion.

The question I'm going to ask is about overland flooding and whether contamination from the site can go through the sewer, combined sewer, the effects on Little Lake. So that's one of the things that I picked up from your intervention that I will be following up on, but

it will take a considerable amount of discussion.

THE PRESIDENT: Dr. Berube?

MEMBER BERUBE: All my questions are probably best addressed to the municipal authorities that are going to be around tomorrow too, fire, other agencies that would best respond to some of the questions that you have.

THE PRESIDENT: Dr. Lacroix?

Dr. McKinnon?

MEMBER MCKINNON: Quickly, quick question. You mentioned that monitoring doesn't provide any real reassurance. And an earlier intervenor mentioned that a problem with monitoring is it tells you what has already happened. So it made me think about the processes in the plant. So I was curious for a question for the company.

Is there any link between monitoring and perhaps automated shut-off of any processes in the plant?

MR. SNOPEK: Dave Snopek, for the record.

Just a clarification. Are you talking about environmental monitoring, stack emissions, that sort of thing?

MEMBER MCKINNON: Yes, I was more thinking of the stack emissions or something like that, but it could

really be any monitoring. But the most immediate would be the stack emissions, which would be linked to some internal process that, you know, something's happened, there's been a spike in a reading.

Perhaps you can't respond quickly enough, but I'm just curious, are there any automated shut-off systems in the plant?

MR. SNOPEK: There's not -- Dave Snopek, for the record.

There's not automatic interlocks, I think is what you're talking about, between, let's say, a uranium emissions stack and the operation. However, we do monitor frequently.

In Peterborough, we monitor on a weekly basis. In Toronto, we monitor on a daily basis, so that's our opportunity to interject quickly.

MR. MacQUARRIE: I'll just add to that that, I mean, there are some sort of immediate signs that things are not working.

So for example, in the room where we vaporize the beryllium to coat the zirconium strips, if the -- if the ventilation isn't working, the lights won't come on in that room so we'd be in the dark. It'd be

obvious it's not working.

THE PRESIDENT: Ms Griffin, any final comments?

MS GRIFFIN: No, thank you.

THE PRESIDENT: Thank you very much for your submission.

This brings us to the close of the hearing today. The hearing will resume tomorrow morning at 8:30 a.m., and I do really sincerely thank you all for your participation and your commitment to stay here till this late.

And have a good evening, or whatever's left of it. Thank you.

--- Whereupon the hearing adjourned at 10:01 p.m., to resume on Thursday, March 5, 2020 at 8:30 a.m. /
L'audience est ajournée à 22 h 01 pour reprendre le jeudi 5 mars 2020 à 8 h 30