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The Honourable Seamus O'Regan
Minister of Natural Resources
House of Commons
Ottawa, Ontario, K1A A06

May 31, 2021

Dear Minister O'Regan,

Thank you for the opportunity to respond to the discussion paper on the "Nuclear Liability and Compensation Act".

I want to preface this submission by stating that nuclear energy has no place in Canada's clean energy transition. In Mission Possible, The Green Party of Canada laid out one plausible scenario for reducing Canada's GHG emissions by 60% below 2005 levels by 2030, as recommended by the IPCC to hold to no more than a 1.5 degrees C increase in global average temperatures. Nuclear energy was not a part of the scenario. The 2020 World Nuclear Industry Status Report stated that nuclear energy development is too slow to address the climate crisis. Nuclear energy projects will take far too long to develop and become profitable, overall costing Canadian taxpayers billions before making any significant contribution to transforming Canada's energy sector. More than anything, investing into nuclear energy takes attention and resources away from cleaner, reliable, affordable renewable energy options, which is why nuclear technology has been renamed a "dangerous, dirty distraction" by civil society.

A key point of this brief is that if the government is to continue supporting the development of nuclear energy, almost solely for the benefit of the major nuclear industry players, then there should be no ceiling of financial compensation that is placed on the players for the consequences that nuclear energy poses Canadian civil society. The industry should be fully liable for any harm caused. Industry players must be reminded that they are "playing at their own risk". With all of this in mind, I present this brief by first addressing my main concerns with the nuclear waste strategy and policy development process, then discussing liability costs that should immediately be increased, and lastly offering recommendations of factors to consider when reviewing the Act.

The Nuclear Waste Management Organization

The federal government should reform the Nuclear Waste Management Organization (NWMO) to include experts independent of the nuclear industry. The NWMO was created in 2002 and it is fundamentally flawed. To take part in the NWMO, the member must be an organization running a nuclear reactor. This group is, by legislation, an organization biased for the industry, because it is exclusively made up of industry players such as Hydro Quebec, New Brunswick Power and Ontario Power Generation. We need to be able to count on the

major body dealing with radioactive waste in Canada to prioritize the health and safety of Canadians and our environment.

An international peer review from the International Atomic Energy Agency (IAEA) deemed Canada's policy and strategies for radioactive waste management inadequate. I want to reiterate the call that many groups and citizens across Canada are making, spearheaded by the Nuclear Waste Watch, to prioritize civil organizations and Indigenous groups in the process of radioactive waste strategy development rather than nuclear industry players, the latter mentioned group wanting to see nuclear energy be developed regardless of the associated risks. Specifically, those who are residents of communities where waste management is already underway, and will be taking place, must be treated as key stakeholders throughout this process.

The NWMO as it stands has already demonstrated that they will use the Act to justify their plans in the face of criticism. The organization referred to the Act to respond to concern over how nuclear accidents would be factored into home insurance for residents near the nuclear waste sites they proposed to build near Ignace or South Bruce in Ontario. The NWMO needs to understand that claiming that they will pay a portion of the clean-up costs does not justify the risk that they are taking. Much of the damage from a potential leak or mismanagement of radioactive waste is immeasurable, will be felt for thousands of years after the event takes place, and cannot be cleaned up for certain as there will be hundreds of broken pieces of uranium atoms that are highly nuclear and unstable released into the environment. This sort of lack of consideration for the real consequences nuclear energy poses is expected when the NWMO is only made up of industry players.

Trusted Intervener

The government should establish an intervening body independent of the industry whose responsibility would be to monitor the appropriateness of the liability costs set for the different installation classes. The intervener should take into consideration whether or not nuclear industry players are following the five principles outlined by the Anishinabek/Iroquois Alliance: no abandonment, monitored and retrievable storage, better containment (more packaging), keeping waste away from major water bodies, and no imports or exports of radioactive materials. Failing to take these steps (keeping in mind that the exporting principle is already being neglected) should result in financial penalties to the industry players that are being negligent. Additionally, the intervener, based on the work of engineers, physical scientists, statisticians, health physicists, ecologists, and biomedical scientists should evaluate the level of threat nuclear installations pose to communities on an ongoing basis and adjust liability costs accordingly.

Uranium Mining and Milling

Facilities such as uranium mines, refineries using natural uranium, and hospital nuclear laboratories are not included as liable parties under the Act. This is a huge blind spot. Canada is one of the world's largest uranium producers. Most of our uranium travels overseas, but the consequences and costs of uranium mining and milling will be experienced primarily by Canadians. Uranium mining and milling is possibly the most polluting part of the nuclear energy manufacturing process. The government must include at least similar compensation as the U.S. Radiation Exposure Compensation Act (RECA) to onsite participants, downwinders, and uranium miners, millers, and transporters if mishaps occur during the mining and milling process. Owners of uranium mines and milling facilities must also contribute to the costs associated with any accidents occurring from the reactors to which they contribute radioactive material.

Address Lasting Damage

The federal government and nuclear industry must address the lasting impacts of previous nuclear projects that are still impacting Canadians today before embarking on strategic planning and policy design for new projects. For instance, the government and industry must address the environmental degradation caused to the Serpent River basin from uranium mining, and the cultural and health consequences posed to the Serpent River First Nation. Uranium production in the area began in the mid 1950s and the last of these mines was

decommissioned in the 1990s. In 2018 a researcher from Laurentian University found that the waters and sediments downstream from the Uranium operations at Elliot Lake still had increased levels of radionuclides and some other metals. If previous damage from nuclear projects cannot be addressed, then the Liability and Compensation Act will be viewed as an empty promise.

Immediate Liability Cost Increases
There should be no cap on the amount that the nuclear industry must pay if an accident is to occur. However, if there must be a cap, then there should be significant increases in multiple areas.

Reactors over 7 MW must be considered as dangerous as power reactors because they are using and developing the same fuel. The government should also consider increasing the liability cost for reactors of 1 MW to 7 MW because the damage they can cause humans and the environment is similar to that of large-scale reactors.

Fuel is not the only waste created by nuclear installations. When neutrons hit uranium ions, they can become plutonium, meaning that all the structural materials around the core of reactors absorb neutrons, turning non-radioactive atoms into radioactive atoms. Because of this, all installations responsible for creating by-products throughout the process of nuclear fuel production (Nuclear Fuel Waste Processing Facilities, Nuclear Fuel Conversion Facilities, and Nuclear Fuel Waste Management Facilities) should take on additional liability because of the increased risk they are creating through toxic materials that can harm people and the environment.

Nuclear Fuel Cycle
Carcinogens and nuclear waste are emitted at all stages of the nuclear fuel cycle, and so it is appropriate to hold actors liable for damages their installations may produce throughout the production of nuclear energy . All installations that contribute to a nuclear reactor's creation and operation are contributing to the more significant risk posed by a fully operating power reactor. For this reason, all players engaged in the creation and operation of nuclear energy should be liable for their part of the nuclear fuel life cycle as well as for the entire operation and maintenance of nuclear reactors and any damages or destruction they bring to individuals, communities and the environment. The government should require all players to put together a combined fund to cover the costs of accidents in advance of any accident taking place, and all players must contribute to the fund regardless of what stage of nuclear fuel production they are principally involved in. This fund should be fully tapped into before turning to taxpayers to clean up any mess resulting from the nuclear industry.

Small Modular Nuclear Reactors
The increased risks being taken with the introduction of conceptual, unproven, proposed small modular nuclear reactors (SMNRs) must be factored into the Act. In particular, the dangerous "molten salt" approach which requires repurposing spent fuel of reactors is exceptionally risky. Any player engaging in its creation and operation should take on additional liability costs for the heightened and uncertain environmental and social risks and threat of nuclear proliferation that comes along with these experimental nuclear projects.

SMNRs are not just risky, but costly. For example, the Utah Associated Municipal Power Systems NuScale SMNR in Idaho has already cost more than double the estimation, and the project developers have taken out a $4.5B loan from the U.S. Department of Energy. In addition, a Canadian study found that energy from SMNRs are ten times more expensive than renewable energy.

Terrestrial Energy in Ontario and Moltex Energy in New Brunswick are using radically different models to continue developing their molten salt reactors than any nuclear energy projects already in operation. Significant financial risks are being taken to see through these projects. Terrestrial Energy received $20M from the government, and Moltex Energy received $56M, including $50.5M for the Moltex company itself. It is

projected that SMNR projects will cost Canadian taxpayers billions. It would be unacceptable to place further financial burden on taxpayers to clean up potential accidents from such installations. The burden should be placed entirely on the companies that are consciously taking these risks. Furthermore, an evaluation by experts outside of the industry should be conducted on behalf of the government and if there is no business case for such a development then these projects should be shut down.

Climate Change Increases Risk
Currently, players such as those involved with the NWMO claim that the threat of nuclear accidents occurring is minimal. However, we must consider the increased risk that will come from climate change and extreme weather events.

For instance, consider the Fukushima Daiichi nuclear disaster of 2011. The event was caused by the Tohoku earthquake and tsunami. During the event, the systems at the plant detected the earthquake and automatically shut down the reactors, and yet, three reactors had their power supply and cooling mechanisms disabled when the tsunami hit. This led to a nuclear meltdown, because despite the workers' best efforts the reactors still overheated and on top of that, the impact led to chemical explosions throughout the plant that badly damaged the plant's buildings.

The IPCC projects that climate change will likely increase the frequency, intensity, duration, and spatial distribution of extreme weather events. Even with measures in place to prevent accidents, there is going to be an increased risk of similar accidents occurring as the Fukushima disaster because of events like earthquakes and floods.

Droughts, fires, and heat waves can also disrupt the operation of nuclear power plants. Droughts and heat waves can impact once-through cooling systems of nuclear plants, resulting in forced shut-downs or capacity reductions. To avoid such outcomes, plants will need to be retrofitted with recirculating cooling systems, adding to costs for taxpayers. Fires also exacerbate the dangers associated with nuclear contamination, releasing radionuclides if they occur near contamination zones, exposing the public to unhealthy levels of radiation. We are seeing these lasting effects in the Chernobyl exclusion zone, which raged with wildfires in April of 2020.

If handled negligently then all of these weather events can result in accidents, but even when properly managed, extreme weather has negative impacts on nuclear plants that cannot be contained. As Canada's climate continues to change, and extreme weather events become more frequent and extensive in size, duration and strength, the growing risk of nuclear accidents and their lasting impacts must be re-evaluated.

Potentially Weaponized Material
Serious consideration needs to be put towards calculating the liability costs associated with the potential for radioactive material to be weaponized. On this note, we call on Canada to ratify the United Nations Treaty on the Prohibition of Nuclear Weapons. Although we are a non-nuclear weapons state, we need to make our stance on nuclear weapons clear on the international front. Much like our advocacy work for the Ottawa Process to ban landmines, despite Canada not manufacturing or using landmines, Canada must be a leader in advocating for a world without nuclear weapons.

Despite Canada being a non-nuclear weapons state, we have had ties to weaponized nuclear material. In the 1940s, we started to produce uranium as a war effort for the U.S. Canadian uranium was used to produce plutonium for bombs overseas. In the 1960s, Canada helped India build a nuclear reactor modeled after the Canadian Chalk River National Research X-perimental (NRX) reactor and India produced their first atomic bomb in 1974. What history demonstrates is that nuclear technology and material produced in Canada can be used in unintended ways with disastrous outcomes. Nuclear installations will require a high level of security

to avoid the catastrophic misuse of radioactive materials, but even if these security measures are taken, there is still a risk of such dangerous material getting into the wrong hands.

Remote Areas
The liability cost of each project should not just be evaluated based on the class of the nuclear installation, but also where the installations are located. The government must acknowledge that building any type of nuclear installation in remote locations where emergency services are inadequate or non-existent will amplify the dangers of a nuclear accident posed to the nearby communities. Residents' ability to evacuate must be factored into the Act, for instance if additional transportation measures need to be in place for residents in an emergency.

Sincerely,

Elizabeth May, O.C.
Member of Parliament
Saanich-Gulf Islands
Parliamentary Leader of the Green Party of Canada