

# **Natural Resources Canada Roundtable on Disposal**

## **March 24, 2021**

### **Questions:**

As you read this discussion paper, please consider the following questions:

1. What do you feel are important policy considerations that should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy?
2. What should be the roles and responsibilities of government, the regulator, and waste owners with regards to radioactive waste disposal facilities, including:
  - Funding,
  - Closure of a disposal facility and its institutional control, and
  - Indigenous and Public Engagement and involvement in site selection and post-closure?

Submitted: April 1st, 2021

### **Thank you for this opportunity to comment on the questions above**

I am a member of the Old Fort William Cottagers' Association (OFWCA). We are residents and cottagers in the community of Sheenboro/Fort William, Quebec. We are the first community downriver from Chalk River, Ontario. We have been paying close attention to Canadian Nuclear Laboratories' two proposals for radioactive waste disposal on the Ottawa River, at Chalk River and Rolphton, Ontario for the past five years.

Recommendations for policy are based on information and experience over these past five years.

## **Disposal**

### **Disposal is the final step in management of radioactive waste**

Disposal means for eternity with eventual abandonment (after a relatively brief period of monitoring) with no intention or ability to retrieve the waste.

### **Currently, there are four proposals for Disposal of radioactive waste in Canada.**

1. CNL (Canadian Nuclear Laboratories) - NSDF (Near Surface Disposal Facility)

2. NWMO (Nuclear Waste Management Organization) - DGR (Deep Geological Repository). To be addressed very briefly.

3&4. CNL - 2 proposals for nuclear reactor in-situ decommissioning - one in Rolphton, Ontario and one in Pinawa, Manitoba. In-situ decommissioning will be addressed in a subsequent roundtable on Decommissioning.

Though the International Atomic Energy Agency (IAEA) may promote disposal ~ **Radioactive waste should not be abandoned without the intention to retrieve - that is the key principle.** The desire to bury radioactive waste underground in a DGR or in a mound, without the ability to retrieve, in order to think the problem is resolved is dangerous.

For this reason, NWMO's and CNL's proposals should be halted.  
**Disposal without possibility of retrieval is a non-starter.**

## **Recommendations - no disposal**

**1. No disposal of radioactive waste without possibility of retrieval ~ disposal must be replaced by management of radioactive waste**

A policy based on disposal will result in unacceptable policies. At this time, we do not have the knowledge or science to ensure that radioactive waste will be safe and contained from the biosphere for eternity. There must be the possibility of retrieval.

**2. Facility for the management of radioactive waste must not be sited near a body of water**

**3. Indigenous groups and the public should be consulted and engaged during all phases**

**4. Waste must be securely and safely contained and isolated from the biosphere**

**5. Monitoring ~ Continuous comprehensive monitoring with necessary remediation.** Safe management of radioactive waste, whether for short or long-term duration, means a system of comprehensive monitoring to ensure integrity of containment with ability to replace containers and to remediate any problems or failures.

**6. Continuous security of radioactive waste facility**

**7. Inventory of all radioactive waste contained in a facility must be maintained**

**8. Identification and classification**

Every container must be labelled so that its contents are clearly identified and can be retrieved for repackaging.

**9. Transportation of radioactive waste must be avoided**

Transportation must be kept to a minimum - short distances (e.g. waste to be moved away from water body where reactors are located). In Scotland the “proximity principle” is followed - radioactive waste is managed close to point of generation.

**10. Information for care must be passed from one generation to the next**

**11. Continual containment improvement from generation to generation**

As new materials and technology are discovered containers should be upgraded until a more permanent solution is possible.

**NWMO’s Proposed DGR in Ontario**

There has never been a DGR for high-level waste in operation anywhere in the world in spite of decades of efforts. All the development work for NWMO’s DGR for Ontario is theoretical. Many very concerning issues have been identified - the containers are unproven, the cavern is likely to fill with water eroding those containers etc. Retrieval is not part of the plan. The proposed DGR is an experiment and the NWMO is not trusted.

**CNL’s proposed NSDF for radioactive waste disposal at Chalk River**

Due to a Go-Co contract signed in 2015, CNL (Canadian Nuclear Laboratories) is managed and operated by a private and profit-driven consortium (CNEA comprised of SNC Lavalin, and two Texas based multinationals: Fluor and Jacobs).

CNL announced in 2016 the proposed NSDF or above-ground engineered containment mound (ECM) that is comparable to an enhanced municipal landfill.

The announcement came without any prior indigenous or public consultation or engagement.

Such a facility for permanent disposal of nuclear waste has never before been licensed in Canada. CNL's two radioactive waste mounds in Port Hope and Clarington, Ontario are not permanent facilities, and do not include nuclear reactor waste.

Evidently, CNL chose the fastest and cheapest method to deal with radioactive waste with insufficient knowledge of the legacy wastes at Chalk River. It is believed that they took an existing Atomic Energy of Canada Limited (AECL) concept for **very** low-level waste and transformed that into the NSDF for all federal wastes. In spite of CNL's attempts to scale back their plans over concerns about radiation doses, the facility remains flawed and inadequate and does not allow for retrieval of the waste.

### **Wrong Facility ~ Concerns regarding the radioactive waste at Chalk River lead to policy recommendations**

The proposed ECM, for one million cubic metres of waste, will rise 5-7 storeys. The IAEA states that only **very** low-level waste should be put in an above-ground landfill type facility. Low-level waste, on the other hand, could be at "near-surface". Near surface is defined by the IAEA as: either below ground or in-ground engineered vaults or trenches. This is not what CNL is proposing.

Though CNL insists that the waste will only be low-level waste, it is clear from the Environmental Impact Statement (EIS) that radioactive materials destined for the ECM will include: tritium, carbon-14, strontium-90, plutonium, up to 80 tonnes of uranium. At least 25 of the 30 radionuclides listed are long-lived. Definitions for low- and intermediate-level waste are blurred and are being changed. It is evident from the EIS that this mound will remain dangerously radioactive for 100,000 years (long after the ECM has disintegrated). A large quantity of Cobalt-60 will also be included and the IAEA says that Cobalt-60 is considered intermediate-level waste and should be stored under-ground.

Gregg Csullogg, ex-Manager of the Waste Classification Program at Chalk River at AECL, wrote in his submission to the CNSC in 2017 on the proposed NSDF:

"My concerns are that Canadian Nuclear Laboratories:

- does not have rigorous chain of command controls over its wastes,
- does not rigorously track its wastes from point of origin to endpoint,
- has inadequate waste characterization,
- has waste management staff with an insufficient understanding of waste classification,
- has inadequate waste segregation and routing procedures,
- has an existing WIRKS [Waste Inventory Record Keeping System] with a lot of bad or missing data, and - may not properly migrate data from its existing WIRKS to a new system.....”

<https://www.ceaa.gc.ca/050/documents/p80122/119166E.pdf>

CNL often claims that demolished buildings, soil, mops and rags will be disposed in the ECM. Statements such as this are purposefully misleading. Many buildings/parts of buildings and soil have been radioactively contaminated from operation of multiple nuclear reactors and nuclear labs over past 70 years. Much of this waste is a mixture of low-level and intermediate-level waste that is impossible to separate. The waste therefore must be considered as intermediate-level waste and treated as such.

The EIS also indicates that non-radiological materials would go into the ECM - dioxin, asbestos, mercury, PCBs and up to 13 tonnes of arsenic and 178 tonnes of lead. It would also contain thousands of tonnes of copper and iron and 33 tonnes of aluminum. Besides tempting scavengers to dig into this facility, do these materials in these quantities conform with provincial and municipal regulations? Would these materials be permitted in a municipal dump in Ontario, in Quebec?

Federally owned radioactive waste is being consolidated at Chalk River. 2000 containers are expected from Whiteshell, Manitoba. Containers are arriving and are being stacked up and will be driven into the ECM if it is approved. Hundreds of containers of radioactive waste should not be transported across the country to an unsuitable location and emplaced in a substandard facility.

### **The location is unsuitable**

The chosen location is one kilometre from the Ottawa River, upriver from Pembroke, Gatineau, Ottawa, Laval, Montreal and communities beyond. Millions of people depend on the Ottawa River for their drinking water.

No siting process was undertaken. The chosen site was selected for convenience. The mound would be partly surrounded by wetlands, a lake and a

creek all draining into the Ottawa River, less than one kilometre away. The area, on a major fault line, is seismically active. The underlying bedrock is fractured and porous. There have been nine tornadoes in eastern Ontario since 2018. The ECM is designed to last 550 years barring any exceptional circumstances or unknown event. The EIS describes many ways that this facility will leak and the mound will disintegrate in a process described as “normal evolution”. At that point radioactive contaminants would leak into the environment and drinking water sources for millennia.

The Assembly of First Nations, fourteen former AECL officials and scientists, hundreds of citizens and organizations, and over 140 municipalities in Ontario and Quebec, including Gatineau and Montreal, have opposed or raised serious concerns about CNL's proposal for Chalk River.

The environmental assessment has been going on since 2016 and there has been no opportunity for public comment since August 2017.

**This disposal facility would place an unacceptable burden on future generations.**

This is the wrong facility - it will not adequately contain the wastes. And it is in the wrong location. It is designed to be ultimately abandoned without the possibility of retrieval. These hazardous wastes will be radioactive for thousands and some for millions of years. Some require lead shielding. Disposing of them above-ground is not in compliance with international safety standards. The facility will discharge effluent (with high levels of tritium) into the surrounding water and creek and into the Ottawa River.

**Resulting problems could be irreversible ~ the burden on future generations could be without measure.**

**Recommendations: Waste Owners/Producers/Proponents**

**1. Waste Classification must be precise and clearly communicated**

Change is required in the way Canada is currently classifying radioactive waste. Very precise definitions with the boundary between low-level and intermediate-level must be clearly defined and they must be followed.

**2. Segregation of intermediate and low level radioactive waste is essential**

### **3. Proponents must include in the environmental impact statement a complete inventory of ALL radionuclides**

Each radionuclide must be listed and quantified with activity levels and half-lives indicated. This information must be communicated to indigenous people and the public in a clear understandable language without scientific symbols.

### **4. Proponent must engage with indigenous communities and the public**

Engagement with the public should occur consistently and at every stage of the process.

### **5. Proponents buying goodwill/consent should be prohibited**

Paying or offering money (bribes) to communities prior to the approval of a project is unacceptable (this is done by both CNL and NWMO).

Article March 25, 2021 Toronto Star | **Ontario communities are divided over allowing burial of radioactive waste in exchange for cash**

<https://www.thestar.com/opinion/contributors/2021/03/25/ontario-communities-are-divided-over-allowing-burial-of-radioactive-waste-in-exchange-for-cash.htm>

### **6. Cradle to grave system to manage radioactive wastes**

Producers/owners of waste are responsible for cost of waste management. Proponents that are not owners or produces but propose and design a facility should also bear some responsibility for costs. CNL is responsible to its shareholders and seeks to make a profit and the Canadian government and taxpayers are responsible for these wastes now and in the long term and ultimately shoulder the cost. This is definitely not a good situation and needs to be rectified.

### **7. Point of origin to final disposition system to manage radioactive waste**

## **Indigenous rights**

All proposals for radioactive disposal and/or storage affecting unceded lands and waters require approval by indigenous peoples.

### **UNDRIP**

- Article 29(1) of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) states that “Indigenous peoples have the right to the

conservation and protection of the environment and the productive capacity of their homelands and resources.”

- Article 29(2) of the UNDRIP states that “States shall take effective measures to ensure that no storage or disposal of hazardous materials shall take place in the homelands of Indigenous peoples without their free, prior and informed consent.”
- Article 32(1) of the UNDRIP states that “Indigenous peoples have the right to determine and develop priorities and strategies for the development or use of their homelands and other resources.”

### **The Joint Declaration between the Anishinabek Nation and the Iroquois Caucus**

In May of 2017, the Anishinabek Nation and the Iroquois Caucus issued a Joint Declaration that stated their opposition to the transportation and abandonment of radioactive waste on their territory as they have an “intimate relationship to the land [and] waters” and believe that they “need to protect the lands, waters and all living things for future generations”. The Joint Declaration asserts the five principles for radioactive waste: no abandonment; better containment and more packaging; monitored and retrievable storage; away from major water bodies; and no imports or exports.

### **For future generations**

**Must have entire radioactive waste inventory at every radioactive waste site.** The entire radioactive waste inventory must be properly archived by people who are professionals in that field and who are trained in the long-term preservation of records, knowledge and memory about cultural legacies across generations.

#### **Pass information from one generation to the next.**

The greatest burden on future generations would be a disposal facility that goes wrong. Pass information from one generation to the next. We can't dispose of it now to avoid this burden. The tragedy is that we really do not know - anyone saying they know that this material will be safe for 1000s of years is not speaking truthfully. We must manage the waste with the best containment with complete identification of what is contained so that it can be retrieved and repackaged when needed. All the information for care must be passed from one generation to the next.



## **Role of the regulator**

### **There is little trust in Canada's regulatory system**

First and foremost, the role of our nuclear regulator, the Canadian Nuclear Safety Commission (CNSC), should be protecting Canadians and the environment from radioactive hazards produced by nuclear reactors. However, it seems that the CNSC is focused on helping proponents get through the environmental assessment process successfully.

Instead of ensuring that proponents adhere to rigorous regulations, CNSC appears to assist proponents. Recently CNSC has been modifying regulations to benefit the nuclear industry and to make the process smoother, easier for proponents. The Canadian Environmental Law Association and NGO's are calling these "sham regulations".

Note: Globe & Mail article 23 March 2021- re: CNSC granting OPG 10 yr license for Pickering in 2018 by "lifting key regulatory roadblocks ... a pattern of placing the industry's interests over those of the public."

The CNSC grants licenses no matter how vigorously opponents may oppose. It is believed that the CNSC has never refused to grant a license.

Though the CNSC may be referred to internationally as a "world class regulator" (because the CNSC is favourable to the nuclear industry), the IAEA in its recent review of Canada's nuclear framework, identified numerous deficiencies.

Though the CNSC may say that everything is totally "safe", it is very difficult to believe when the concerns have been ignored. CNSC is woefully inadequate. CNSC claims to be following science. However, when scientists themselves criticize a proposal and CNSC ignores it, what is one to believe.

██████████, a nuclear engineer and consultant who once worked for OPG, gave damning testimony at the NRCan roundtable on March 24, 2021 on Disposal - saying that the CNSC is "incapable of regulating" and "lies continuously".

## **Recommendations for Role of Regulator**

**1. The nuclear regulator's mandate must be to protect Canadians, their health, and the environment now and for generations to come**

**2. Transparency and truth are essential**

Transparency is necessary to engender trust in the mandate to protect Canadians, their health, and the environment.

**3. The regulator must be truly independent**

Independence is key and I refer here to not being influenced by the nuclear industry. The CNSC should report through the Minister of the Environment and Climate Change which is more in line with CNSC's mandate.

**4. Engagement with the public and the indigenous community**

This is extremely important. Engagement should be a dialogue of mutual respect. Instead of trying to sell and convince the public, the regulator should be defending the public interest.

**5. The regulator needs to regulate**

The regulator must hold a proponent accountable. Regulations need to have teeth. The regulator must be free to refuse a license.

**6. Regulations need to be prescriptive**

The proponent must not call the shots and not make its own decisions.

**7. The regulator should have a balance of experts**

Experts in numerous fields such as nuclear science, ecology, health etc.

**8. Regulator should not be making decisions that are irreversible**

## **Role of Government**

**1. The regulator should not report to a body that is promoting the nuclear industry**

The IAEA strongly advises against a regulator reporting to a body that is promoting what the regulator is meant to regulate.

The regulator should not be reporting through the Ministry of Natural Resources but to the Ministry of the Environment and Climate Change and possibly also to Health and Indigenous Affairs.

**2. A whole of government approach ~ Decisions should be debated by the Federal Cabinet ultimately**

The regulator should not have sole power to determine if a proposal is accepted. There should be oversight and checks and balances in the system.

**3. There should be a completely independent body (apart from the CNSC ) for the management of radioactive waste ~ Ensure that new policies are implemented by this new independent body (not CNSC)**

This body should be independent of the government and the nuclear industry. Several countries have established independent agencies for the long-term management of radioactive waste and the decommissioning of nuclear facilities – agencies that have no direct ties to the nuclear industry or to the nuclear regulator: e.g. ANDRA in France, NDA in the UK, BGE in Germany.

**4. Waste Classification needs major overhaul**

Currently the definitions are vague - leading to a great deal of confusion. For optimum levels of safety, precise boundaries between low-level and intermediate level waste are required. It actually seems that CNSC is allowing waste owners to implement their own waste classification systems and to vary them for any waste management system. This is bad practice and opens the door to unsafe management of radioactive waste. This must be rectified.

**Radioactivity and Health ~ Need for research and review**

**5. Health investigations**

Investigations should be responsibility of government but done independently.

**“There is no safe level of exposure to any man-made radioactive material.**

All discharges, no matter how small, into our air and water can cause cancer and many other diseases as well as genetic damage and birth defects” according to Dr. Eric Notebaert, Canadian Association of Physicians for the Environment.

**6. Review “acceptable” levels** Canada’s permissive guidelines are questionable. Allowable limits of tritium and radioactive pollution in our water

should be lowered drastically, yet this has been ignored in favour of the nuclear industry. Tritium levels especially must be reviewed and revised.. For example: acceptable tritium levels in Canada: 7000 Bq/Litre vs.100 in Europe and 14.7 in California. Because of the very large quantities of tritium produced by CANDU reactors, Canada's standard for tritium in drinking water has remained unacceptably high. The Ontario Drinking Water Advisory Committee has recommended 20 becquerels per litre.

### **7: Review environmental release limits of radioactive wastes into air and water**

Review models used in Canada to calculate allowable exposures.

### **8. Cumulative effects**

Review release limits and acceptable levels in light of cumulative effects.

Dr. Ian Fairlie writes about the "biological and health effects of exposures to tritium" and the "risks faced by people living near nuclear facilities". His conclusions are "broadly applicable to all nuclear facilities".

"Much evidence from cell/animal studies and radiation biology theory indicates that tritium is more hazardous than gamma rays and most X-rays. However the International Commission on Radiological Protection (ICRP) continues to underestimate tritium's hazard... the most common form of tritium is water, ie radioactive water, means that, when tritium is emitted from nuclear facilities, it rapidly contaminates all biota in adjacent areas. Tritium binds with organic matter to form organically bound tritium (OBT) with long residence times in tissues and organs"

<https://www.ianfairlie.org/news/the-hazards-of-tritium/>

### **9. Precautionary principle and pollution prevention approach should be given the same dominance in future radioactive waste management policies as the polluter pays principle.**

Current radioactive waste policy only explicitly recognizes the polluter pays principle. The precautionary approach and pollution prevention principles are equally important under Canadian environmental law, and as such all three principles should guide future radioactive waste management policy.

## **Intergovernmental Recommendation: Decisions should be debated by the ministers and cabinet**

Radioactive waste policy must explicitly underline that a radioactive waste facility must not only comply with federal law but also provincial and municipal legislation and regulations.

## **Conclusion**

The Federal Government should halt CNL's proposal for a radioactive waste disposal facility at Chalk River and NWMO's proposed DGR in Ontario until federal policies are implemented. The current CNSC environmental assessment for the NSDF should end and the Minister of Environment and Climate Change should initiate an assessment under the Impact Assessment Act of 2019.

People believe that the risk is far too great to proceed with the NSDF or with a DGR. Permanent disposal and abandonment of radioactive waste without the possibility of retrieval must be off the table.

There are alternatives that will provide for safe long-term management of man-made radioactive waste that will contain and isolate these hazardous elements from the biosphere.

Alternatives for the safe short-term or long-term management of radioactive waste can be discussed during the Roundtable on Storage.

Thank you.

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April 1st, 2021