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CMD 22-H7.41B

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Final submission from the Sierra Club Canada Foundation

Mémoire définitif de la Fondation Sierra Club Canada

In the Matter of the

À l'égard des

Canadian Nuclear Laboratories (CNL)

Laboratoires Nucléaires Canadiens (LNC)

Application from the CNL to amend its Chalk River Laboratories site licence to authorize the construction of a near surface disposal facility

Demande des LNC visant à modifier le permis du site des Laboratoires de Chalk River pour autoriser la construction d'une installation de gestion des déchets près de la surface

Commission Public Hearing
Part 2

Audience publique de la Commission
Partie 2

May and June 2022

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Canada

FONDATION SIERRA CLUB CANADA FOUNDATION

Sierra Club Canada Foundation – Final Written Submission on the NSDF Project

Elected government officials should decide if reduced costs of a radioactive waste disposal facility justify increased risks to people and the environment.

In CMD 22-H7.41, Sierra Club Canada Foundation discussed the trade-off between reduced costs; and increased health, safety and environmental risks; for the NSDF Project, Canada's first-ever permanent disposal facility for man-made radioactive waste.

Our position remains that a decision on the environmental effects of the NSDF Project should be taken at the highest levels of government, and not by the regulatory body, the Canadian Nuclear Safety Commission (CNSC). Canadian law allows for this.

A webpage entitled *The CNSC as a Unique Regulator* says

> The Commission does not report to a minister, but rather directly to the Parliament of Canada (through the Minister of Natural Resources). Decisions made by the Commission are not subject to government or political review and cannot be overturned by the Government of Canada.

However, this statement does not apply to Commission decisions related to the *Canadian Environmental Assessment Act* (CEAA) 2012.

If it is likely that a project will cause "significant adverse environmental effects," section 52 of CEAA 2012 provides for a referral to the Governor in Council (Cabinet) through the Minister of Natural Resources:

> **Decisions of decision maker**
>
> **52 (1)** For the purposes of sections 27, 36, 47 and 51, the decision maker referred to in those sections must decide if, taking into account the implementation of any mitigation measures that the decision maker considers appropriate, the designated project
>
> **(a)** is likely to cause significant adverse environmental effects referred to in subsection 5(1); and

(b) is likely to cause significant adverse environmental effects referred to in subsection 5(2).

Referral if significant adverse environmental effects

(2) If the decision maker decides that the designated project is likely to cause significant adverse environmental effects referred to in subsection 5(1) or (2), the decision maker must refer to the Governor in Council the matter of whether those effects are justified in the circumstances.

Referral through Minister

(3) If the decision maker is a responsible authority referred to in any of paragraphs 15(a) to (c), the referral to the Governor in Council is made through the Minister responsible before Parliament for the responsible authority.

It is highly likely that the NSDF - proposed to be Canada's first-ever permanent disposal facility for man-made radioactive waste produced by nuclear reactors, and a designated project under CEAA 2012 - would cause significant adverse environmental effects.

The NSDF design - -an above-ground, landfill-type facility – represents a sacrifice of public health and safety, and environmental protection, in exchange for cost savings. A decision as to whether this trade-off is justified should be made by elected officials, not by a regulatory agency.

Canadian Nuclear Laboratories (CNL) includes Table 2.5.2-2 in its NSDF Environment Impact Assessment (EIS). The table compares the NSDF proposal to a Geologic Waste Management Facility (GWMF). It provides qualitative rankings of these two alternatives as "Most Favourable", "Favourable", or "Least Favourable".

Table 2.5.2-2 ranks the GWMF alternative as superior in terms of

- Design Robustness,
- Geological and Hydrogeological Environment,
- Social Acceptability, and
- Public Health and Safety (long-term).

Table 2.5.2-2 ranks the NSDF alternative as superior in terms of

- An Example of Best Available Technology,
- Monitoring Complexity,
- Life Cycle Cost,
- Terrestrial Biodiversity, and
- Worker Health and Safety.

These are qualitative rankings that could be challenged. They are not backed up with detailed assessments. New evidence has emerged that the NSDF would have serious adverse effects on terrestrial biodiversity. The argument that the NSDF is superior in terms of Worker Health and Safety ignores the increased worker exposures associated with leaving radioactive materials above ground.

CNL lists only one "Least Favourable" ranking: for the "Life Cycle Cost" of a GWMF.

CNL claims that this cost would be "up to approximately $6,250 million," compared to a "total lifecycle cost of approximately $750 M for the NSDF alternative using an engineered containment mound, which is more than an order of magnitude less [sic] than the cost of a GWMF alternative." But there have been no credible independent assessments of the cost estimates for the NSDF Project or for the GWMF alternative.

The NSDF is being promoted solely in terms of cost savings, despite creating higher risks to public health and safety.

In the matter of a tradeoff of public health and safety for cost savings, Principle 4 of the IAEA *Fundamental Safety Principles* should be applied: "For facilities and activities to be considered justified, the benefits that they yield must outweigh the radiation risks to which they give rise."

The higher long-term public health and safety risks associated with the NSDF would be borne by many future generations of Canadians. These higher health and safety risks, associated with a design that allows contaminant migration, cannot be justified.

Article 13 (Siting of Proposed Facilities) of the IAEA's *Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management* should also be taken into consideration:

> Each Contracting Party shall take the appropriate steps to ensure that procedures are established and implemented for a proposed radioactive waste management facility: (i) to evaluate all relevant site-related factors likely to affect the safety of such a facility during its operating lifetime as well as that of a disposal facility after closure…

Relevant site-related factors were not properly evaluated in the CNSC's environmental assessment of the NSDF Project. CMD 22-H7 ignores serious deficiencies in the proponent's siting process, including factors that make the chosen NSDF site unsuitable for long-term radioactive waste disposal.

For example, CMD 22-H7 (p. 124 of 590) says “CNSC staff review of the NSDF safety case identified that uncertainties on fracture zones in the bedrock at the NSDF site remain” and that “further geological verification will be undertaken during the construction phase.”

However, far from being “uncertain”, the NSDF EIS (Section 5.3.1.4.2.1, “Regional Geological Conditions – Bedrock”) says that the southern portion of the chosen site is underlain by a “high-probability fracture zone,” 10 meters wide and over a kilometer long. This creates a groundwater flow pathway with “permeability values several orders of magnitude greater than bulk rock mass.”

Poor quality bedrock should have eliminated the NSDF site from further consideration during the site characterization stage. Allowing construction to begin for a government-owned radioactive waste disposal facility at a location that very likely has unsuitable geological characteristics creates unreasonable safety risks and has the potential to waste large sums of public money.

During last year’s public hearing, CNL admitted that the bedrock at the NSDF location is highly fractured to depths of tens of meters. George Dolinar of CNL suggested that this is advantageous because it makes the bedrock predictable for modelling:

> “…where we expect some contaminant migration to take place, a highly fractured bedrock is advantageous from the point of view that it’s predictable. So it behaves as an effective porous medium, which is the technical terminology, so it behaves like a sand or gravel matrix… Our bedrock is highly fractured. And to some degree when, you know, blasting and removal of that upper bedrock takes place to make room for the facility, that will also increase the fracturing of that underlying rock as well. So that’s a benefit from a long-term modelling point of view…”

Ole Hendrickson replied for the Sierra Club Canada Foundation:

> "In terms of the notion that highly fractured rocks are really good for radioactive waste disposal because they make it easier to model how much leaching there will be, I guess we'll have to disagree with CNL on that point. From a public perspective, we do not want a facility that's designed to leach predictably into surface water resources like Perch Lake and the Ottawa River. That's not containment. That's not isolation from the biosphere. That's not what the IAEA recommends as a proper disposal facility. That's the first thing that you should try to do -- isolate and contain the waste and protect the biosphere. This facility is not designed to do it."

Our Sierra Club Canada Foundation submission CMD 22-H7.41 describes the flaws in the NSDF siting process in considerable detail. We quote Appendix 1 of IAEA Specific Safety Guide SSG-29, *Near Surface Disposal Facilities for Radioactive Waste*, which says siting is a "fundamentally important activity in the disposal of radioactive waste."

IAEA Specific Safety Guide SSG-29 describes four stages of a siting process:

> (1) A conceptual and planning stage;
> (2) An area survey stage, leading to the selection of one or more sites for more detailed consideration;
> (3) A site investigation stage of detailed site-specific studies and site characterization; and
> (4) A site confirmation stage.

(1) There was no conceptual and planning stage for the NSDF Project. There was no prior consultation with First Nations, the public, or local elected officials on siting. CNL, or its owners, repurposed AECL's existing plans for a "very low-level waste" landfill, a facility deemed by the IAEA as suitable only for such materials as contaminated soil and rubble. CNL renamed the landfill as a near surface disposal facility – a deliberate misuse of internationally accepted terminology. CNL plans to put packages with high radioactivity and long-lived radionuclides in their so-called "NSDF". These waste types are unsuitable for above-ground landfill disposal.

(2) There was no area survey stage for the NSDF Project. The site was chosen for convenience, to minimize the cost of waste transport. CNL, or its owners, gave serious consideration only to sites on the Chalk River Laboratories property. This was a logical decision for them, because in 2018 CNSC had renewed the site licence for Chalk River Laboratories, authorizing CNL to "prepare a site for, construct, operate, modify, decommission or abandon a nuclear facility" anywhere on the property (CMD 18-H2).

(3) As mentioned above regarding the underlying bedrock, the site investigation stage yielded negative results. CNL's *Near Surface Disposal Facility Site Selection Report, Revision 2,* 232-10300-TN-001, has more details. The chosen site for the NSDF did not meet two criteria used in AECL's very low-level waste facility siting process -- a 10% slope restriction and a minimum overburden thickness. CNL altered the slope restriction from 10% to 25% and dropped the overburden thickness criterion altogether.

Please note that this *Site Selection Report* does not appear to be publicly available, and it is not referenced in CMD 22-H7.

Additional problems with the NSDF site are that the water table is within six centimeters of the surface on a portion of the site, and it adjoins wetlands that drain into Perch Lake, Perch Creek, and the Ottawa River, only one kilometer away.

(4) In terms of "site confirmation," rather than objectively assessing these problems, CMD 22-H7 provides the following statement:

> CNSC staff assessed the site selection and site evaluation of the proposed site and location of the NSDF against applicable standards, specifically Appendix I of the IAEA SSG-29… CNSC staff are satisfied that the NSDF site selection process used structured criteria and methodology and is in alignment with the applicable standards. (CMD 22-H7, p. 37 of 590).

The CNSC was asked in writing by an intervenor during the hearing, "What is the basis for stating that the NSDF siting process was in alignment with IAEA Safety Guide SSG-29?" The CNSC has not responded.

With respect to the proposed NSDF location, CMD 22-H7 includes a text box labeled "*Differing Views"*, which reads, in part:

> CNSC finds CNL's rationale for the location of the proposed NSDF Project to be acceptable. In contrast, AOPFN [Algonquins of Pikwakanagan First Nation] remains concerned about proximity to the Kichi Sibi [Ottawa River] and the lack of meaningful engagement of AOPFN in assessment of alternative locations for siting any such facility… (CMD 22-H7, p. 466 of 590)

The Kebaowek First Nation, in CMD 22-H7.113B, says that CNSC Staff refused to discuss the issue of lack of consultation on the site selection process, claiming that "determination of location and type of Project is out of the scope of the CNSC's decision making authority."

An absurdly inappropriate site for a radioactive waste disposal facility is on the verge of being approved. This would be precedent-setting: Canada's first permanent disposal facility for man-made radioactive substances, containing the Government of Canada's own waste.

Are reduced costs an acceptable trade-off for increased long-term health risks, and increased environmental contamination? This should be decided by elected officials.

We repeat that under section 52 of CEAA 2012, the Commission can act as follows:

> **Referral if significant adverse environmental effects**
> (2) If the decision maker decides that the designated project is likely to cause significant adverse environmental effects referred to in subsection 5(1) or (2), the decision maker must refer to the Governor in Council the matter of whether those effects are justified in the circumstances.

Referral through Minister

(3) If the decision maker is a responsible authority referred to in any of paragraphs 15(a) to (c), the referral to the Governor in Council is made through the Minister responsible before Parliament for the responsible authority.

We stress that elected government officials should decide whether the significant adverse environmental effects that would be caused by the NSDF Project are justified. Canadian law allows the Commission to refer this matter to Cabinet through the Minister of Natural Resources. This is the appropriate course of action for the Commission.