Ecological Justice Working Group

Justice, Mission and Outreach Committee
United Church of Canada, Regions East

Submission to Impact Assessment Agency Canada February 4, 2026

Comments on the *Initial Project Description* for the *Deep Geological Repository for Canada's Used Nuclear Fuel Project*

By Ecological Justice Working Group of the Justice, Mission and Outreach Committee, Regions East, United Church of Canada

Contact: Dr. Mary Lou Harley

> *Let us not be guided by corporate agenda, by political motives, by military urging, by fear or by overconfidence.*
>
> *Let us be guided by ethical considerations and social values arising from the best efforts of respectful, participatory consultation with the citizens and experts, and by the best of social sciences, natural sciences, and technologies, with the wisdom to acknowledge the uncertainties and limitations of our best.* (United Church 2004)

This proposal by the Nuclear Waste Management Organization (the NWMO) entitled Deep Geological Repository for Canada's Used Nuclear Fuel Project indicates from this title and confirms in the Initial Project Description (IPD) an intention by the NWMO to try to isolate for assessment one aspect of this nuclear fuel waste management system. Such an approach is misleading and dangerous, minimizing the depth of technical review and limiting the social perspective.

Our comments review the adequacy of the components and the system as a whole, as built on decades of work in Canada on nuclear power issues including long-term nuclear fuel waste management.

The development of this NWMO proposal is in effect the third stage of a process where the first stage started from public acknowledgement of the existential threat of nuclear fuel waste and subsequent stages have set requirements of the long-term management of nuclear fuel waste. The

United Church brings those requirements forward and briefly raises specific issues about the IPD.

The United Church of Canada Perspective

The United Church of Canada has principle-based approaches to environment and development issues. In Canada now, we have under consideration a number of nuclear fuel system issues, including refurbishments, consideration of new nuclear power plants, expansion of uranium exploration and mining, plans for the fabrication and use of enriched uranium, and specific to this submission, a proposed Deep Geological Repository system as the long-term management option for our nuclear fuel waste.

The principle-based approach of the United Church views nuclear fuel waste as inseparable from all of these nuclear fuel system issues and as interconnected with many broader issues directly related to how we view the world and see our place in it.

In gratitude for the richness of Creation, with growing awareness of the complexity of life-sustaining systems and our humble place as one species among millions in this interdependent web of life, we acknowledge humanity's ability to do far-reaching damage.

Theological and ethical reflection and over 60 years of involvement by the United Church in hearings and public engagements on nuclear issues has led the United Church to view nuclear fuel waste within

· the complex of problems in nuclear fuel production and use
· the international problems of nuclear wastes
· the risks of proliferation of military applications of radioactive materials
· the question of the future of nuclear power.

Our submission is grounded in this broad base, particularly United Church ethical principles and policies (excerpts in Appendix A) and documents from direct involvement of the United Church in major engagements on the long-term management of nuclear fuel waste, particularly submissions to the Canadian Environmental Assessment Panel (Seaborn Panel 1989-1998) reviewing the nuclear fuel waste disposal concept of Atomic Energy Canada Ltd. (AECL), and the diverse opportunities for input on the many issues of

long-term management of nuclear fuel waste in the process of the Nuclear Waste Management Organization (2003-2005) toward *Choosing A Way Forward.*

Relevant Requirements Resulting from Major Engagements On The Long-Term Management Of Nuclear Fuel Waste

This background relates directly to the development of the present NWMO proposal as the third stage of a process where the first stage is detailed in the documents relating to tasks of the Seaborn Panel and the second stage is detailed in the documents of the NWMO process toward *Choosing A Way Forward*. The present NWMO proposal fails to incorporate in the IPD some of the essentials from these foundational stages or the proponent takes an opposing position without acknowledgment or explanation.

Stage 1 The Concept

The Seaborn Panel conclusions on the assessment of the AECL concept of geological disposal of nuclear fuel wastes apply to the NWMO proposal:

- broad public support is necessary to ensure the acceptability of a concept for managing nuclear fuel wastes,
- safety is a key part but only one part of acceptability, and
- safety must be viewed from two complementary perspectives: technical and social.

The Panel reported on social and technical shortcomings, concluding that from a technical perspective, although there were nearly a hundred technical shortcomings, safety of the AECL concept had been on balance adequately demonstrated *for a conceptual stage of development*, without a specific project or site. However, from a social perspective, safety had not been adequately demonstrated.

While the Seaborn Panel assessed the *AECL concept of geological disposal of nuclear fuel wastes for which there was not a specific project at a specific site*, the Terms of Reference also directed the Seaborn Panel

> *….to examine the criteria by which the safety and acceptability of a concept for long-term waste management and disposal should be evaluated….*

The Seaborn Panel defined the criteria by which the safety and acceptability of **any concept** for long-term waste management should be evaluated:

> *To be considered acceptable, a concept for managing nuclear fuel wastes must*
> *a) have broad public support;*
> *b) be safe from both a technical and a social perspective;*
> *c) have been developed within a sound ethical and social assessment framework;*
> *d) have the support of Indigenous people;*
> *e) be selected after comparison with the risks, costs and benefits of other options; and*
> *f) be advanced by a stable and trustworthy proponent and overseen by a trustworthy regulator.*
>
> *To be considered safe, a concept for managing nuclear fuel wastes must be judged, on balance, to*
> *a) demonstrate robustness in meeting appropriate regulatory requirements;*
> *b) be based on thorough and participatory scenario analyses;*
> *c) use realistic data, modelling and natural analogues;*
> *d) incorporate sound science and good practices;*
> *e) demonstrate flexibility;*
> *f) demonstrate that implementation is feasible; and*
> *g) integrate peer review and international expertise.*

Also, the Seaborn Panel recommended that a concept chosen as an option for nuclear fuel waste long-term management that is similar to the AECL concept, as the NWMO proposal is, should have included in its assessment a review of all the social and technical shortcomings of the AECL concept that were identified by the Scientific Review Group and the other review participants of the Seaborn Panel process.

NWMO Must Address These Requirements

- The NWMO IPD must acknowledge and respond to these criteria. The conclusions of this task by the Seaborn Panel on the *criteria by which the safety and acceptability of a concept for long-term waste management and disposal should be evaluated* are directly relevant to assessing this NWMO DGR Project.

- NWMO must provide sufficient information to allow independent experts to evaluate the safety acceptability, from both technical and social perspectives, of their site-specific deep geological repository. In particular, information must be sufficient to address all the social and technical shortcomings of the AECL concept that were identified by the Seaborn Panel process.

- NWMO must be transparent on how the concept underpinning their site-specific DGR compares and contrasts with the AECL concept for geological disposal of nuclear fuel wastes, and provide details of effects of changes with respect to the technical and social safety shortcomings identified by the Seaborn Panel process.

A Side Note:

Further, the Seaborn Panel discussed the need for *an ethical and social assessment framework* and an explicit means by which public and Indigenous participation would be an important factor in determining acceptability and informing decision-making.

Unfortunately or deliberately, there has been no such ethical and social assessment framework established by the government. One aspect of this issue is that the engagements that a proponent is tasked to do are open to ethical problems such as conflict of interest, bias and even intimidation to build acceptance for their proposals. This issue is raised not as an accusation, rather it is seeking support from the IAAC for the establishment of that ethical and social assessment framework that would guide all related engagements.

Stage 2 Implementation

The NWMO was established under the Nuclear Fuel Waste Act (2002) and tasked to investigate for three years approaches for the long-term management of nuclear fuel waste, to recommend an approach to the Minister of Natural of Natural Resources Canada, and to implement the approach selected by the Minister. Thereby, the NWMO entered the implementation stage.

The NWMO incorporated the outcomes of the Seaborn Panel and the input from Canadians to that Assessment process as management approaches were reviewed based on each of the three technical methods specified under the Act (deep geological disposal, storage at reactor sites, and centralized storage) and a combination of these methods. All options for the long-term management of nuclear fuel waste have significant shortcomings and uncertainties, and none can provide the verifiable containment required by the timeframe of the inherent chemical and radiological toxic hazards of nuclear fuel waste.

Nature of the Hazard

The radioactivity and the chemical composition of nuclear fuel waste will change with time; however, nuclear fuel waste will continue to be radioactive and chemically toxic at hazardous levels.

After about 10 million years, the radioactivity and potential internal exposure health hazard of used CANDU fuel has reduced to approach that of uranium ore, with some additional chemical concerns. Uranium ore is itself a chemically hazardous radioactive mixture. Relating nuclear fuel waste to uranium ore gives a comparison to a naturally occurring radioactive material (NORM), not to a level of safety.(Mehta et al 1991)

Some of the elements in the mixture of different chemicals in nuclear fuel waste will transform over time, as a result of emitting alpha or beta radiation, to different elements with different toxicities. Lots of chemicals we produce are toxic; however, their elemental nature does not change. In discussing hazards, the changing elemental nature of nuclear fuel waste over time demands different considerations of changing solubilities, changing absorption characteristic for its contact in living tissues and associated health impacts, and many other aspects, even changing states (solid to gas). The chemical toxicity and radiation hazard of the changing mixture

that is nuclear fuel waste persists at a high level forever as does natural uranium ore

How we package nuclear fuel waste, and how we and future generations manage the packaged waste, will affect the risk of exposure to the inherent hazards of the waste. However, there is not at this time and may never be an option that is capable of isolating the waste for the timeframe of its inherent hazards or solving the problem of nuclear fuel waste's long-term inherent hazards.

Adaptive Phased Management (APM)

The NWMO reviewed extended storage at reactor sites, centralized storage, and deep geological disposal in the Canadian Shield and other geological formations as approaches to nuclear fuel waste management. Each of these options was found to have some advantages in some areas over the other options, all had shortcomings, and all had significant uncertainties.

The NWMO evaluated an Adaptive Phased Management approach which combines aspects of the three reviewed options. APM is not a solution to the hazards of this radioactive, highly toxic waste. It is an approach for longer-term nuclear waste management that offers an opportunity to further explore options by remaining flexible and open to continuous learning, although it comes with its own complex of challenges, uncertainties, and limitations.

In 2005, the NWMO recommended APM, in which nuclear fuel wastes would be aged for at least 30 years at the reactor sites, followed by continued storage at reactor sites or at a centralized storage for a flexible time period, with the intention of ultimately putting the waste in a deep geological repository, essentially a modification of the concept of deep geological disposal previously proposed by Atomic Energy Canada Ltd. (AECL).

The Minister selected APM as the approach for nuclear fuel waste in Canada and noted that taking this step was vital to the future of nuclear power.

The United Church warned that Adaptive Phased Management could be merely step-wise implementation of deep geological disposal in which citizen engagements may be public relations exercises, and early engineering

decisions and financial commitments may bar directional change, negating all but minor modifications. The processes used for decision-making and implementation will be crucial. The United Church advised NWMO that:

> *For the adaptive management approach to be something other than implementation of deep geological disposal:*
>
> - *the importance of social acceptability must be upheld as a fundamental decision-making criterion;*
> - *site selection must not be biased by early placement of the waste in centralized storage at the proposed deep repository site; issuance of licenses or other restrictive decisions;*
> - *decision points must have sufficient choice to allow change in the core concept and reversal of course of action;*
> - *public participation must be meaningful and remain broad, engaging communities directly impacted and those indirectly impacted as taxpayers, electricity rate-payers, and citizens" (United Church, November 2005)*

The NWMO included in its report values summarized from consultation with citizens and adopted the *Ethical and Social Framework* by the NWMO Roundtable on Ethics, with the suggestion that the framework be considered further by NWMO and Canadians.

The United Church recommended that the NWMO

- *·continue its research into enduring ethical principles and values that can help guide long-term thinking;*
- *clearly present ethical considerations in future work; and*
- *develop both a substantive (what is to be done) and a procedural (how it is to be done) ethical and social framework, and consider the full context in which nuclear fuel wastes are generated starting from uranium mining.*

The United Church noted that the NWMO Roundtable on Ethics revised statement was in agreement with the United Church of Canada stand:
an ethically acceptable approach to managing existing stockpiles of nuclear fuel waste would not ethically justify the production of new nuclear fuel waste.

The NWMO Must Address These Requirements

The statement of values in the IPD is inadequate and ethical considerations are absent.

For the present assessment, the NWMO must substantively address the ethical issues, including

- provide the ethical framework underpinning this project
- be transparent on the details that are changed in the present Adaptive Phases Management plan from the Adaptive Phased Management plan in the 2007 report "Choosing A Way Forward," and why those changes have been made.
- discuss the ethical issues and timeframe of responsibilities associated with the APM plan for the NWMO proposed project
- address the values and the ethical issues in the *Ethical and Social Framework* referenced above,
- respond to the ethical issues raised by the advice and recommendations from the United Church listed above

Stage 3 Site-specific Project, Incidental Transportation

The NWMO must honour the work that has gone before them and respond to requirements from that work.

The NWMR must address concerns and requirements received in the input to this IAAC assessment process and the outcome of this process.

The NWMR must acknowledge that in moving from the Implementation stage to a site-specific project, transportation is an essential component to get the nuclear fuel waste to the repository site

Additional Specific Issues About the NWMO IPD

- The proposal by the NWMO, **"Deep Geological Repository for Canada's Used Nuclear Fuel Project" must be designated for a full impact assessment and public hearings.**

The information provided in the previous sections of our comments relate to the complexity of issues to be addressed, the controversies, the serious

far-reaching consequences, which are barely mentioned in the IPD, and the absence of ethical considerations apart from the welcomed page on values relating to intentions in engagement with the Indigenous communities. All the factors of a high risk project with associated immediate and very long-term ethical, environmental, social, economic impacts and Indigenous impacts and questions of environmental racism demand the full participation by experts, the public, and Indigenous communities that is afforded through a full impact assessment and public hearing. In fact, please refer this project to an integrated review panel established under Section 43 of the Impact Assessment Act.

- The **NWMO must provide a detailed Initial Project Description**

As indicated throughout our comments, the IPD fails to provide the necessary information about this NWMO project.

- **<u>Transportation must be included</u> in the IPD and detailed in the impact assessment.**

This project, involving a sitespecific DGR by necessity must include a means of getting the nuclear fuel waste to this site. The statutory definition of designated project under the impact Assessment Act says that designated project includes any physical activity that is incidental to the project. The DGR cannot fulfill its stated purpose unless the wastes are transported to it. The wastes would not be transported, a risky activity, if it were not for the DGR.

While transportation is an activity regulated by the CNSC, so are other parts of this project, like the DGR, and that cannot be used to limit the impact assessment in this case.

- **<u>The "Need" for this project is not demonstrated</u> and it is a high risk project. On that basis alone, it should not proceed.**

"Need" is an important component of impact assessments, required under Section 22 of the impact assessment and the principle underpinning this requirement is that unless there is a demonstrable public need for a risky

undertaking, it should not be allowed to proceed, and those impacts should be avoided

Of the three reasons given for the Need of this project, two are dependent on guaranteed permanent safe disposal which the NWMO project cannot provide.

The other reason given for Need is the popularized but unfounded claim that nuclear energy is required to meet climate action.

Emissions of carbon dioxide from the use of fossil fuels for energy is a major contributor to the carbon cycle imbalance and the resulting global warming. Important as it is to curtail and radically reduce the production of greenhouse gas emissions, we must also reevaluate our energy options to reduce the environmental, health, and security risks of those energy option. Also, for a valid comparable evaluation, available energy options must be assessed through a lifecycle analysis from starting materials to waste products.

Building on more than two decades of work by various church courts, the United Church policy statement Energy in the One Earth Community details the conclusion that Canada needs to shift its energy policy from an emphasis on large-scale fossil fuel and nuclear energy generation projects to a focus on “soft-path” energy options. This policy promotes energy conservation, increased energy efficiency, and the development of renewable alternative energy sources. Further, this policy affirms the appropriateness of responding to the global warming trend by using renewable energy approaches as the primary strategy for reducing fossil fuel emissions rather than expanding nuclear power production. In developing this policy statement, climate change issues were explored together with the ecological and social justice dimensions of each energy source.

When the nuclear fuel system is viewed throughout the production chain from uranium exploration through to decommissioning facilities and long-term waste management, nuclear power is a significant greenhouse gas emitter. Although it is argued that nuclear power generation contributes small amounts of GHG emissions once a nuclear electricity generation plant is up and running, the mining and milling of uranium for nuclear power is very energy intensive, as is fuel fabrication, and transportation, which all add to the ongoing GHG emissions involved in operation of a nuclear power plant. The emissions contributed by the production of the cement and

building materials, the transportation, and the other activities associated with nuclear facility construction, add to the major emissions across the full lifecycle of a nuclear power plant. In addition, enriched nuclear fuel fabrication requires a large energy input, and it can involve the release of greenhouse gases more damaging than carbon dioxide, so if Canada moves to enriched uranium production as proposed, the overall system would be a more significant emitter of greenhouse gases.

As well as greenhouse gas emissions, the nuclear fuel system releases radioactive gases. In fact, it is the gaseous, liquid, and solid radioactive and chemically toxic wastes from uranium mining and milling, fuel fabrication, and nuclear power plants, particularly nuclear fuels wastes and decommissioning wastes, that are the principal hazardous wastes of the nuclear fuel system. It is not necessary or wise to reduce GHG emissions by turning to the host of radioactive chemically toxic wastes of nuclear power.

Appendix A

The United Church brought the growing theological reflection on living with respect in Creation together in the policy statement, *One Earth Community: Ethical Principles for Environment and Development* adopted in 1992 by the 33rd General Council. In this policy, the statement of 12 ethical principles is a framework which seeks to include environmental, social and economic justice considerations, and personal, corporate, and governance responsibilities in environment and development issues:

1. Human societies must bear a responsibility toward the Earth in its wholeness.

2 To be both people-oriented and ecologically-sound, all development strategies must be founded on a just international economic order, with priority for the world's poor.

3. Lifestyles of high material consumption must yield to the provision of greater sufficiency for all.

4. Environmental destruction must stop and humanity must understand itself collectively responsible both for the destruction and for the repair thereof.

5. The rights of future generations must be protected.

6. The carrying capacity of the Earth, regionally and globally, must become a criterion in assessing economic development.

7. The bio-diversity of the Earth must be respected and protected.

8. Militarism must yield to non-violent approaches to conflict resolution.

9. Decision-making for just and ecologically-sound development must ensure the participation of individuals and groups, especially those most affected by the project.

10. Both opportunities for learning and access to knowledge must be assured in order to facilitate sustainable development.

11. Development decisions must emphasize prevention of ecological damage.

12. Procedures and mechanisms must be established ensuring a transnational approach to environmental issues and disputes.

These 12 ethical principles served as a foundation for the work by the United Church on energy issues including nuclear energy and nuclear fuel waste.

The 37th General Council in 2000 adopted the comprehensive energy policy statement *Energy in the One Earth Community,* which states in part:

Energy policy in Canada should be based on ethical principles of respect for and justice within the One Earth Community, and should shift away from the strategy of expanding supply through energy mega-projects and focus more on managing demand and development of renewable, alternative sources. Specifically, Canada should:

[multiple recommendations related to various energy forms including the following]

-reduce our reliance on nuclear power, a technology which entails a level of risk many find unacceptable and for which there are still unresolved problems such as the safe disposal (or safe storage) of high level wastes of nuclear reactors;

– a moratorium should be instituted on the expansion of existing facilities and/or the establishment of new nuclear facilities or uranium mines, such moratorium to extend to the disruption of radioactive deposits and the export of nuclear technology and materials;

– in terms of nuclear waste management and disposal, the government should ensure that the full set of options for approaches to nuclear waste management are adequately explored in an open and transparent process with the necessary expertise in social and environmental science and in ethics. Any waste management agency that is set up should operate at arm's length from both the utilities and AECL, with a board and advisory council having broad representation (United Church 2000).

The Nature of the Hazard

The radioactivity and the chemical composition of nuclear fuel waste will change with time; however, nuclear fuel waste will continue to be radioactive and chemically toxic at hazardous levels until Earth is consumed in the death of our Sun.

After about 10 million years, the radioactivity and potential internal exposure health hazard of used CANDU fuel has reduced to approach that of uranium ore with some additional chemical concerns. Uranium ore is itself a chemically hazardous radioactive mixture. Relating nuclear fuel waste to uranium ore gives a comparison to a known substance, not to a level of safety.(Mehta et al 1991)

Some of the elements in the mixture of different chemicals in nuclear fuel waste will transform over time, as a result of emitting alpha or beta radiation, to different elements with different toxicities. Lots of chemicals we produce are toxic; however, their elemental nature does not change. In discussing hazards, the changing elemental nature of nuclear fuel waste over time demands different considerations of changing solubilities, changing absorption characteristic for its contact in living tissues and associated health impacts, and many other aspects, even changing states (solid to gas). The chemical toxicity and radiation hazard of the changing mixture that is nuclear fuel waste persists at a high level forever as does natural uranium ore

How we package nuclear fuel waste, and how we and future generations manage the packaged waste, will affect the risk of exposure to the inherent hazards of the waste. However, there is not at this time and may never be an option that is capable of isolating the waste for the timeframe of its inherent hazards or solving the problem of nuclear fuel waste’s long-term inherent hazards.