COMMENTS ON THE NUCLEAR WASTE MANAGEMENT ORGANIZATION'S INITIAL PROJECT DESCRIPTION

Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project

IAAC Ref# 88774

Submitted on behalf of Northwatch

February 4, 2026

1. Introduction

On January 5, 2026 the Impact Assessment Agency of Canada announced that the Impact Assessment Agency of Canada (IAAC) and the Canadian Nuclear Safety Commission (CNSC) are working together on the integrated assessment of the Nuclear Waste Management Organization's (NWMO) *Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project* and that Indigenous Peoples and the public were invited to review the summary of the Initial Project Description for the Deep Geological Repository for Canada's Used Nuclear Fuel Project and provide feedback by February 4, 2026.[1]

The IAAC public registry page provides a brief summary of the NWMO project, as follows:

> *The Nuclear Waste Management Organization (the NWMO) is proposing a new underground deep geological repository system designed to safely contain and isolate used nuclear fuel. Wabigoon Lake Ojibway Nation (WLON) and the Township of Ignace have been selected as the host communities for the proposed project, which is located 21 kilometres southeast of the WLON and 43 kilometres northwest of the Town of Ignace, Ontario along Highway 17. As proposed, the Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project would provide permanent storage for approximately 5.9 million bundles of used nuclear fuel. The project is expected to span approximately 160 years, encompassing site preparation, construction, operation and closure monitoring. The project assessment is being conducted in collaboration with the Canadian Nuclear Safety Commission.*[2]

The public registry is maintained by the Impact Assessment Agency and stores and makes available documents and public comments regarding federal impact assessments. A registry page for the NWMO's Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project (Reference #88774) was created in July 2024 and a first post – a Protocol among Canadian Nuclear Safety Commission, Impact Assessment Agency of Canada, and Nuclear Waste Management Organization – appeared on the registry in the same time period dated July 22, 2024. The document is a "protocol among Canadian Nuclear Safety Commission, Impact Assessment Agency of Canada, and Nuclear Waste Management Organization". The registry states that Version 2.0 signed on September 4, 2024 to update the project name and state the effective date of protocol. No public comment was invited on that protocol.

The second posting on the registry was the *Initial Project Description of a Designated Project - Deep Geological Repository (DGR) for Canada's Used Nuclear Fuel Project*[3] dated as being posted on January 5, 2026. This posting was immediately followed on the same day with

[1] January 5, 2026 notice, as posted at https://www.iaac-aeic.gc.ca/050/evaluations/proj/88774?culture=en-CA

[2] IAAC registry page as found at https://www.iaac-aeic.gc.ca/050/evaluations/proj/88774?culture=en-CA

[3] As posted at https://www.iaac-aeic.gc.ca/050/evaluations/document/164492

postings of the Summary of the initial project description[4] and a public notice[5] that comments are invited on the summary of the Initial Project Description and that participant funding was available.

Northwatch's review of the NWMO's Initial Project Description (IPD) will provide commentary and response to a short list of key areas and provide brief comments on other issues as they arose in our review of the document.

There are many instances where the Nuclear Waste Management Organization (NWMO) document makes statements which may mislead or create a false impression for readers unfamiliar with the history of the NWMO and the NWMO's project development and siting process. Some of these have been noted, and others not simply to avoid repetition or undue distraction from the key issues.

Northwatch's review was undertaken of the 263-page version of the Initial Project Description which comprises the first section of the 1,233 page version of the Initial Project Description of a Designated Project as posted on the IAAC registry on January 5, 2026 and page number references are based on that version of the document.

[4] As posted at https://www.iaac-aeic.gc.ca/050/evaluations/document/164740
[5] As posted at https://www.iaac-aeic.gc.ca/050/evaluations/document/164641

2. Northwatch's Interests

Northwatch is a regional coalition in northeastern Ontario with a long-standing interest in the impacts of the nuclear fuel chain and the management of radioactive wastes, given the presence in our region of the world's largest uranium refinery and millions of tonnes of radioactive uranium mine tailings and our experience as the repeated target of nuclear waste "disposal" projects. Northwatch has a dual mandate of advocating for environmental protection and supporting public participation in environmental decision-making.

Northeastern Ontario is comprised of six federal districts, five of which (excluding the District of Manitoulin, which is an island off-shore of the North Shore of Lake Huron) will be *en route* should the NWMO ever proceed to transporting nuclear fuel waste from the nuclear generating stations in southern Ontario and eastern Canada to a site in northwestern Ontario. Half of the federal districts have previously been investigated as potential sites for a deep geological repository (Temiskaming District by AECL, Sudbury District by NWMO and Algoma District in multiple locations by AECL and NWMO).

Northwatch formed in 1988 in large part to provide a regionally representative voice in the Federal Environmental Assessment Review Office assessment of Atomic Energy of Canada Limited's Geological Disposal Concept (the precursor to the NWMO's concept) and was a full participant in the scoping hearings in 1990 and the three phased public hearing in 1996 and 1997. Northwatch subsequently was a witness at the Parliamentary and Senate hearings on the Nuclear Fuel Waste Act in 2002 and has since the NWMO's subsequent formation been actively engaged with the monitoring of and responding to the NWMO's project development.

Northwatch has been engaged with the 19 communities in Ontario that were investigated by the NWMO as potential sites (including 13 in northern Ontario), developing and sharing analysis with community residents and the concerned public more generally.

Since 2010 Northwatch has been networking with residents in northwestern Ontario with respect to the risks and impacts of the NWMO's evolving concept for a DGR project and associated activities, given the NWMO investigation of multiple communities in the northwest including Schreiber, Nipigon, Red Rock, Ignace and Ear Falls. Northwatch has provided workshops and information summaries to support residents' learning about the NWMO project and becoming informed about the associated risks.

Northwatch has knowledge with respect to the NWMO's project and its project development and siting process, and with the predecessor AECL concept. Northwatch is also familiar with other international programs and has tracked their progress – and in some cases lack thereof – over several decades, and in more detail over the last decade, including by participating in international networks and hosting international panels discussing various countries' DGR programs.

Northwatch and Northwatch's membership are resident along the two routes for radioactive waste transportation through northeastern Ontario (Highway 11 and Highway 17) and have a high-level of concern with respect to the prospect of the NWMO transporting nuclear fuel waste through the region, including an estimated 2-3 trucks per day for fifty years are more. Concerns

relate to the low-levels of radiation bystanders and fellow-travellers will be exposed to during "normal" operations and the risk of a container breach during an accident or other upset condition resulting in larger releases.

The NWMO is currently developing a siting process for a second repository for intermediate and non-fuel high-level waste (as outlined in the Integrated Strategy for Radioactive Waste) and for high-level nuclear fuel waste from "new" reactors, as has since been added to the waste inventory unilaterally by the NWMO (post-Ministerial response to the ISRW).

Northwatch and Northwatch members are concerned about the potential for decisions made with respect to the NWMO's current DGR proposal becoming precedent-setting or normative and thus potentially affecting future decisions to made with respect to the ILW+ DGR which the NWMO intends to develop in the near future and which could potentially be sited in northeastern Ontario.

3. Summary of Comments

- NWMO's Initial Project Description is inadequate and does not provide the information required, including and particularly it does not sufficiently describe or otherwise demonstrate that it has adequately examined alternatives to the project or alternative means of carrying out the project, and the IPD largely goes off course in its description of the need and purpose of the project.
- As directed by the Nuclear Fuel Waste Act the need or purpose of the project is to effectively isolate the nuclear fuel wastes from people and the environment.
- The NWMO has not provided a clear statement of the need and purpose for the project, and when it discussed the need and purpose of the project in its IPD it muddied the waters by including unsupported promotional statements and out-of-scope policy statements about the future role of nuclear power.
- Instead of setting out careful consideration of alternative means of meeting the project need (to safely contain and isolate the nuclear fuel waste from people and the environment) the NWMO simply summarized some aspects of their 2003 studies. The IPD should include a contemporary assessment of alternative means of meeting the project need.
- The NWMO's consideration of alternative means of carrying out the project is too limited; the alternative means examination should also include alternative sites, alternatives in repository access (ramp vs shaft), transportation in used fuel containers instead of in transportation packages, the alternative means of in-water transfer of used fuel at repository site (vs "in air" ie. in hot cells), alternative mining methods, alternatives in waste emplacement (in-room vs in-floor) and alternatives in used fuel container design
- The NWMO's description of the project and project activities is too limited, and at times is promotional rather than factual in its approach.
- The NWMO has misrepresented the fuel waste inventory, upon which repository size, years of operation, and resulting degrees of risk and contamination all hinge.
- The NWMO excluded the first step in their project, which is the transfer of the used fuel waste from dry storage containers into transportation containers at the reactor site; this is consistent with past practice.
- Without foundation the NWMO is attempting to exclude long-distance transportation from the Impact Assessment process; this is inconsistent with the impact assessment law in Canada and with the manner in which the NWMO has been describing their project over the last twenty years.
- The Initial Project Description inadequately describes major project components and activities, including the Used Fuel Packaging Plant, waste placement and repository design and construction and closure, decommissioning and monitoring.
- The description of the Project Site, Location and Study Area(s) is flawed and in some respects inaccurate.

- The potential effects of the project are poorly described and in some instances the NWMO text is promotional rather than factual.
- The description of the site selection process is very selective in the information it presents and creates a false impression of community experience through the siting process in the 22 communities that the NWMO investigated.
- There are significant gaps and deficiencies in the Initial project description; several subject areas fundamental to the assessment of the deep geological repository are extremely limited or fully absent including the subjects of long-term safety, emergency response and evacuation plans, accidents and malevolent acts and security.
- The Initial Project Description was poorly organized and was not copy edited; it lacked an index and there was no glossary included.
- NWMO's Deep Geological Repository Project should be designated for a full impact assessment and public hearing
- The long-distance transportation of nuclear fuel waste from the reactor stations to the proposed repository site must be included in the impact assessment

4. Review of Initial Project Description

4.1 Project Purpose, Need and Alternatives

The Impact Assessment Act sets out in clear language what factors must be considered in an impact assessment[6] stating that whether the impact assessment is conducted by the Agency or a review panel it must take into account multiple factors, some of which are discussed elsewhere in Northwatch's comments, but including the following:

- the purpose of and need for the project
- alternatives to the project (that would meet that purpose or need)
- alternative means of carrying out project

Consistent with the findings of our more general review, Northwatch finds that the NWMO's Initial Project Description as provided to the Agency on December 9, 2025 is inadequate and does not provide the information required, including and particularly it does not sufficiently describe or otherwise demonstrate that it has adequately examined alternatives to the project or alternative means of carrying out the project, and the IPD largely goes off course in its description of the need and purpose of the project.

Establishing a need and purpose for the project and examining alternatives and alternative means to meet that need and purpose are fundamental to the Act, and to environmental / impact assessment and assessment processes more generally. Until the NWMO gets this part of the assessment process right, there is no plausible reason to proceed in the process.

4.1.1. Purpose and Need for the Project

The Nuclear Fuel Waste Act (2002), the legislation that provides the NWMO with their mandate, is rather internally focussed, describing the Act's purpose as being to "provide a framework to enable the Governor in Council to make, from the proposals of the waste management organization, a decision on the management of nuclear fuel waste that is based on a comprehensive, integrated and economically sound approach for Canada"[7] and the purpose of the resulting waste management organization as being to "propose to the Government of Canada approaches for the management of nuclear fuel waste".[8] Neither states the purpose of the "approach" that is to be recommended and then decided upon.

The Nuclear Waste Management Organization's 2005 report *Choosing a Way Forward The Future Management of Canada's Used Nuclear Fuel (Final Study)*[9] characterizes the need,

[6] Impact Assessment Act, Section 22.1, including subsections (d), (e) and (f), as viewed on 2/2/2026 at https://laws.justice.gc.ca/eng/acts/i-2.75/page-3.html#h-1160335
[7] NFWA 2002, Section 3
[8] NFWA 2002, Section 6(1)
[9] IPD, Appendix D

purpose and/or objective of their project as to isolate the nuclear fuel waste from the environment into perpetuity (for example, consider the statements "used fuel will need to be contained and isolated from people and the environment essentially indefinitely"[10]).

Similarly, a technical description of the NWMO's "Adaptive Phased Management" approach issued the same year stated that "the NWMO's overall goal is to effectively contain and isolate used nuclear fuel for all time while ensuring that it is managed safely and securely at all times" and that the NWMO's long-term management approach would be based on containment and isolation of used fuel.[11]

Later reports restated this purpose or objective of the NWMO's "Adaptive Phased Management" project, such as in 2010 two page project summary which characterized the purpose as being "for used nuclear fuel to be contained and isolated in a deep geological repository in a suitable rock formation" while the 2023 Confidence in Safety stated that "the fundamental safety objective of the project is to protect humans and the environment, including water, from harmful effects of radioactive or hazardous substances present in the used fuel".[12]

From these examples and others in a multitude of NWMO reports we can surmise that the objective or purpose of the NWMO's Adaptive Phased Manage as described throughout the last 20 years of NWMO reports is to contain and isolate the nuclear wastes in order to protect humans and the environment from the harmful effects of nuclear fuel waste. Even the IPD itself makes similar statements:

> *Protecting people and the environment is the foundation of this Project. The purpose of the Project is to ensure used nuclear fuel is safely managed over the long term so that it does not pose a risk to human health or the environment.*[13]

Through that lens we consider the "need and purpose" for the project as presented by the NWMO in their December 2024 Initial Project Description.

The purpose as presented in Section 7 of the IPD is initially consistent with the statements referenced above, stating that "the purpose of the Project is to provide a permanent, safe, and environmentally responsible solution for the management of all of Canada's used nuclear fuel."

As the section continues, however, it weakens the purpose statement through a combination of unsupported statements and unrelated claims. The table below summarizes a representative sampling by providing the statement and corresponding commentary.

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[10] Choosing a Way Forward, Section 1.1
[11] NWMO BACKGROUND PAPERS, 6. TECHNICAL METHODS, 6-18 ADAPTIVE PHASED MANAGEMENT: TECHNICAL DESCRIPTION, October 2005, page 1
[12] Confidence in Safety – Revell Site – 2023 Update, NWMO-TR-2023-07, December 2023, Nuclear Waste Management Organization, page 3
[13] IPD page viii

Purpose of the Project	
The Project will safely contain and isolate approximately 5.9 million used fuel bundles in a stable geological formation, eliminating the need for ongoing active management and protecting people and the environment for generations to come.	The long-term safety of the approach has not been established, and has been largely left unaddressed in the IPD; it is a) not clear that ongoing active management will not be required and b) that active management is not a safety requirement (for example, monitoring and mitigation measures)
The capacity of 5.9 million used fuel bundles is the projected total inventory of used nuclear fuel estimated expected to be produced in Canada from the current fleet of reactors to end of life, as outlined in the NWMO's 2024 Nuclear Fuel Waste Projections Report (NWMO 2024).	The 5.9 million bundle estimate does not appear to include the waste that will be produced through extended operation as a result of the Pickering refurbishment
Need for the Project	
Currently, used nuclear fuel is safely stored in Licenced interim facilities at reactor sites. While effective in the short term, this approach requires continuous active management and imposes a long-term burden on future generations. The need for the Project arises from the requirement to transition from interim storage to a permanent, passive disposal solution that ensures long-term safety, minimizes environmental risk, and upholds intergenerational responsibility.	The DGR project will also impose a long-term burden on "future generations". With a biological generation considered to be 20-25 years and a sociological generation considered to be 15 years, the NWMO's current statements of the project "life" being 160 years means that 8-12 generations are being "imposed" on and future generations may find they are differently but also imposed on by having the options of improved management (monitoring, mitigation) removed through the placement of the wastes in the nearly inaccessible lower reaches of a DGR.
The Project also addresses the broader policy objective of sustaining nuclear energy as a low-carbon, reliable power source that contributes to Canada's climate goals.	The mandate set out for the NWMO in the Nuclear Fuel Waste Act did not include setting energy policy. There has not been a net analysis done of the comparative climate costs/benefits to the NWMO APM project combined with expanded nuclear power versus long term management of the waste at the point of generation combined with an energy strategy based on efficiency, conservation and renewables.
Potential Benefits	
The Project will generate enduring benefits for host communities, the region, and Canada as a whole. These include:	

• permanent and safe containment of used nuclear fuel, ensuring protection of people and the environment	This has not been established, and the IPD provides insufficient information to make any such determination
• support for Canada's climate action and net-zero objectives by ensuring nuclear energy remains a sustainable and socially responsible energy source	The mandate set out for the NWMO in the Nuclear Fuel Waste Act did not include setting energy policy and there is no evidence that nuclear energy is either sustainable or socially responsible. These are unsupported opinion statements.
• long-term employment, training, and business opportunities in northwestern Ontario and across Canada advancement of intergenerational equity by removing the need for future generations to actively manage nuclear waste and reducing long-term environmental risks	The IPD does not example or even consider lost opportunity costs for other employment sectors in northwestern Ontario who may find themselves unable to compete for employees because the NWMO is not constrained by market rates or balancing revenue and expenses. There is also no evidence that the NWMO's DGR project will result in a net risk reduction in any time frame, given the increases risk of transportation, nuclearizing a rural and remote region introducing heretofore unknown security risks, and radiologically contaminating a greenfield site. [14]

In summary, the need or purpose of the project is to effectively isolate the nuclear fuel wastes from people and the environment. That is what is required. While the very long time scale and the many outstanding technical and scientific uncertainties which accompany the geological disposal concept will make demonstrating that the NWMO's APM concept can meet that purpose challenging, the function of the Initial Project Description is to summarize how the purpose will be met through the NWMO's project to provide a basis for developing the Integrated Tailored Impact Statement Guidelines (ITISG or "guidelines"), when then establish the scope of the impact statement which will serve as the information base for the assessment process, including the public hearing.

The NWMO has not provided a clear statement of the need and purpose for the project, and when it discussed the need and purpose of the project in its IPD it muddied the waters by including unsupported promotional statements and out-of-scope policy statements about the future role of nuclear power.

[14] IPD, page 40-41

4.1.2 Alternatives to the Project

In their Initial Project Description the NWMO purports that because in a 21 year old report[15] they met the requirements of the Nuclear Fuel Waste Act to study three pre-set options for the management of radioactive waste (continued storage at site, centralized storage, or a deep geological repository) they are exempt from the requirements of the Impact Assessment Act to consider alternative means of meeting the project need. This is simply not the case.

Instead of setting out careful consideration of alternative means of meeting the project need (to safely contain and isolate the nuclear fuel waste from people and the environment) the NWMO simply summarized some aspects of their 2003 studies[16].

The IPD should include a contemporary assessment of alternative means of meeting the project need. For example, the IPD should include – but not be limited to – as assessment of the following two alternatives to the NWMO's deep geological repository:

- expanding on the work done during the 2002 to 2005 study period, the NWMO should examine and objectively present the alternative of extended on-site storage[17] that has been made more robust and hardened to reduce risk, especially from extreme weather events and terrorist or other malevolent acts
- The NWMO should evaluate and present the option of deep borehole disposal; this is not an option which Northwatch supports, but it is a contemporary option[18] under development and being given serious consideration in other jurisdictions and it should be examined as an alternative to the DGR

Northwatch does not contend that these are the only two alternatives that should be examined, but that they are two alternatives that have international currency and are sufficiently developed and contemporary to allow a detailed examination as alternatives to the NWMO project.

[15] *Choosing a Way Forward* (NWMO 2005), included in Appendix D of the IPD

[16] See, for example, "Conceptual Designs for Reactor-site Extended Storage Facility Alternatives for Used Nuclear Fuel Alternatives for the Pickering, Bruce and Darlington Reactor Sites", CANTECH, 2003, prepared for the NWMO, as found at https://www.nwmo.ca/-/media/Reports---Files/PDFs/2015/11/17/23/25/975_alternativesforthepickeringbru.ashx?rev=f43f875fe6f24339ae49b94b0393a594&hash=BAF22420463F05680EDCC006666DCE76

[17] See for example, these two papers on extended on-site storage: 1) IAEA, "International Atomic Energy Agency (IAEA) Technical Meeting on Extending Spent Fuel Storage Beyond The Long Term", 22–24 October 2012, and 2)Nuclear Regulatory Commission, "Project Plan for the Regulatory Program Review to Support Extended Storage and Transportation of Spent Nuclear Fuel", June 2010

[18] See, for example, IAEA research project "Deep Borehole Disposal Options", as found at https://www.iaea.org/projects/crp/t22003

4.1.3 Alternatives Means of Carrying Out the Project

The NWMO discusses alternative means of carrying out their project in Section 12.2 of the Initial Project Description in a one paragraph statement that describes alternative mean as "still being considered through ongoing studies" and then provides a list of operational aspects of the project, with the disclaimer that "this list is preliminary and will be subject to revision based on the results of further engineering and study."[19]

The table simply lists a number of on-site operational aspects of their project which they intend to study further to identify alternative means. That list includes options for heating and electricity supply, variations in alignment and location of transmission line and associated infrastructure, options for using surface water or groundwater sources for water supply, options for location of the effluent water discharge point(s), alternative treatment technologies and techniques to control effluent water quality, variations in configuration and siting of the Excavated Rock Management Area, variations in configuration and siting of the Organics Management Area, options for managing conventional and radioactive waste generated on site, and options for the location of permanent and temporary accommodations camps.

Several of these are significant to the project and its potential for adverse impacts on the environment (including on the social environment, such as the accommodation camps) and should be detailed in the IPD. That NWMO has excluded the discussion of these alternative means because they are still "preliminary" and the subject of "ongoing study" is another indication that the NWMO's entry into the impact assessment process is premature.

In addition to the ten alternative means which the NWMO identified but is not yet capable of describing, there are several additional alternative means to carrying out the project which are very significant and which have been wholly admitted. Those alternative means include but are not limited to those set out in the following table.

Alternative sites	The IPD does not describe an examination of alternative sites outside of its description of its site selection process in which the NWMO placed the emphasis – both in implementation and description in the IPD – on the "willingness" factor rather than on the safety factors. For example, the NWMO should provide a detailed rationale for the selection of a site which is a) at great distance from the current location of the fuel waste and b) is in a crystalline rock formation. The NWMO was the "consultant" to Ontario Power Generation (OPG) for the environmental assessment (under CEAA) of OPG's proposed deep geological repository for low and intermediate level waste. On multiple occasions during this review process OPG's consultants or "experts" provided analysis to the review panel indicating that the sedimentary rock formation was a preferred geological setting for a deep geological repository (i.e. preferred over a crystalline rock formation).

[19] IPD page 94

	One such example is found in a report[20] prepared by or for OPG in response to a request from the federal Minister of Environment and Climate Change for additional information on alternate locations. In that report, Section 4.1.2 *Unique Alternate Project Attributes in the Crystalline Location* provides commentary on why sedimentary (as is found at reactor stations) is preferred to crystalline (as is found at NWMO's proposed Revell site in northwestern Ontario). The section included the following points which are particularly pertinent: - Additional engineered barrier(s) would likely be required because of the fractured, more permeable nature typical of crystalline rock. This could include additional grouting to control water inflow from fractures, and backfilling of some emplacement rooms to limit the free water movement in the vicinity of the waste packages. - For a more fractured and permeable crystalline location, it is likely that additional engineered barriers would be required including pre-processing of the resins (e.g., solidification) and backfilling the space within or around the waste packages with cement. Given that OPG – NWMO's primary shareholder – provided such evidence in 2016 with respect to the study of alternate locations for the OPG proposed (now withdrawn) DGR, it is extraordinary that NWMO did not include a description of their own study and comparison of alternative sites in the IPD.
Repository Access	A key aspect of the project is the means to access the underground repository. In the IPD the NWMO selection of three vertical shafts as the means of access to the repository at depth in multiple locations, often by including shafts in various bulleted lists, and by providing brief descriptions, such as in Section 9.5.2 where the NWMO states that "The current plan is that the shafts will be sunk and excavated using a controlled drill and blast mining excavation technique. It is anticipated that the use of explosives will be controlled, and grouting will be used as needed to manage groundwater inflows. The NWMO is monitoring developments in mechanical excavation mining techniques and may switch to alternative methods that do not use explosives if they become available, are practically feasible (e.g., suitable for expected geological conditions) and economically achievable.[21] At no point in the document did we find a rationale for the selection of shafts rather than ramps as the means of access for the DGR, although the IPD does acknowledge that the issue was raised as an overarching theme in feedback received from the public: *Questions were raised about the repository design, particularly the absence of a ramp and reliance on vertical shafts.*[22]

[20] Ontario Power Generation, Study of Alternate Locations Main Study, 00216-REP-07701-00013, December 2016

[21] IPD Section 9.5.2 Listing of Major Construction Activities, page 61

[22] IPD Section 4.3 Key Issues Raised, Subsection 4.3.1 Overarching Themes, page 30

	The IPD makes repeated references to "international best practices" and related (unsupported) claims that the NWMO's project as described in the IPD is consistent with that practice. In fact, the NWMO's project concept is an outlier internationally, including and particularly with respect to their selection of shafts versus ramps as the means of access. Three other deep geological repositories for the placement of high-level waste are currently in the licencing stage: Sweden (since 2011), Finland (since 2012) and France (2023) and all three designs use ramps versus shafts for the transfer of the used fuel to the repository at depth. The NWMO has reported at nuclear industry conferences on an internal study to compare these access options,[23] but this important alternative means of carrying out the project was wholly overlooked in the IPD.
Transportation in used fuel containers instead of in transportation packages	While the NWMO is attempting to have the transportation of used fuel from reactor sites to the Project site excluded from the project assessment[24], as discussed elsewhere in this submission, the examination of alternative means of transporting the wastes from the reactor stations to the project site is also excluded. Both these deficiencies must be rectified. Of particular relevance to the discussion of "alternative means", the revised IPD (or, alternatively, a detailed project description) must include an examination of the alternative means of transferring the wastes from the current location (dry storge containers at the reactor stations) to the underground repository. More specifically, the IPD and the subsequent impact statement must consider the alternative means of placing the used fuel in a "final container" at the reactor station (referred to in the NWMO concept as the "fuel container) rather than in a transportation container (referred to in the NWMO concept as the Used Fuel Transportation Package and the Basket Transportation Package)[25] for transport to the site and subsequent transfer from the transportation container / package into the final used fuel container. The IPD does not include a discussion of transportation from the reactor stations to the project site, but it does include summaries of how transportation is described in the 2005 Choosing A Way Forward report which is the basis for the NWMO's siting and design of the deep geological repository concept for which they have now entered the impact assessment process.

[23] NWMO, Used Fuel Deep Geological Repository Shaft Versus Ramp Trade-off Study, 2016, abstract found at https://proceedings.cns-snc.ca/index.php/pcns/article/view/5399; note that this document has not been made available

[24] IPD pages vii, 50, 51

[25] NWMO, Deep Geological Repository Transportation System Conceptual Design Report Crystalline / Sedimentary Rock, APM-REP-00440-0209 R001, September 2021, as found at https://www.nwmo.ca/-/media/Reports---Reports/APMREP004400209.ashx?sc_lang=en

	In summarizing Option 1 from *Choosing a Way Forward* (*Deep Geological Disposal in the Canadian Shield*) the IPD sets out that "there would be a need for transportation containers and facilities to produce them; processing facilities to load the fuel into transportation containers; production facilities for deep repository containers; processing facilities to transfer the fuel from transportation to deep repository containers; and production facilities for sealing materials."[26] In summarizing Option 4 (Adaptive Phased Management) the IPD indicates that during *Phase 2 – Design And Characterization* the NWMO would "Examine the possible need for transportation containers and facilities to produce them; processing facilities to load the fuel into transportation containers; production facilities for storage containers; and processing facilities to transfer the fuel from transportation to storage containers".[27] Keeping in mind the NWMO claim to be following "international best practice" it is problematic that the NWMO has not incorporated "lessons learned" from the Yucca Mountain project in the U.S. and the evolution of that project under scrutiny. A key change in the project design between 2002 and 2008 was with respect to the packaging of the wastes, and the elimination of a step which is also problematic with the NWMO concept design, that being the receipt of the wastes in transportation containers and transfer of the wastes into final containers at the repository sites. Initial plans for Yucca Mountain included shipment of wastes from current locations to the repository site where the fuel would be transferred into the disposal canisters (referred to as "used fuel containers" in the NWMO concept) for placement in the repository using a series of hot cells, as is the case with the NWMO's conceptual "Used Fuel Packaging Plant". In the technical literature this method is also referred to as "in air transfer" (as opposed to transfers in water, such as in the irradiated fuel bays at reactor stations, which is how all transfers of used fuel take place at nuclear generating stations in Canada). The decision regarding the packaging of nuclear waste for the proposed Yucca Mountain repository has shifted over time, with a significant emphasis placed on moving away from on-site repackaging towards utilizing standardized, transportable canisters loaded at the reactor site. The primary strategy, often associated with the Transportation, Aging, and Disposal (TAD) canister system, was intended to minimize handling and worker exposure at the repository site.

[26] Table 12.1: Features for Option 1—Deep Geological Disposal in the Canadian Shield, Representative Conceptual Design Activities for Deep Geological Disposal in the Canadian Shield, IPD page 77

[27] *Table 12.4: Features for Option 4—Adaptive Phased Management,* Representative Conceptual Design Activities for Adaptive Phased Management, IPD page 83

	Earlier repackaging was assumed to take place at the repository itself, which posed risks of increased radiation exposure to workers and added significant costs. A study of civilian spent nuclear fuel handling prepared for the U.S. Department of Energy evaluated the handling of civilian spent nuclear fuel "in air" (i.e. in hot cells) and packaging activities in the repository surface facilities and found that contamination levels and dose rates were expected to be much higher "than desirable". The study estimated that it would take approximately four to 40 days of operation to contaminate the fuel transfer cell to a level that may impact radiological safety and require periodic decontamination. The study concluded that this rate of contamination was unacceptable.[28] In 2005, the Department of Energy (DOE) moved to adopt a canister system. In this system, the canisters are designed to be loaded at commercial reactors, sealed, transported to Yucca Mountain, and placed directly into the repository without being reopened or repackaged, significantly reducing the need for on-site handling. This would reduce worker exposure and site contamination at the repository site. Since completion of the Yucca Mountain FEIS in 2002, DOE has continued to develop the repository design and associated construction and operational plans. As now designed, the surface and subsurface facilities would allow DOE to operate the repository following a "canistered approach" in which most commercial spent nuclear fuel would be packaged at the reactor sites in transportation, aging, and disposal (TAD) canisters. Any commercial spent nuclear fuel arriving at the repository in packages other than TAD canisters would be repackaged by DOE at the repository into TAD canisters.[29] Also, the Yucca Mountain project evolution included the addition of a "Wet Handling Facility" which would carry out any transfer of commercial spent nuclear fuel into canisters underwater (as is the case at Canadian nuclear generating stations, where transfers from in and out of dry storage containers are handled in the irradiated fuel bay).[30] In addition, a handling canister, sealed at the reactor to eliminate further handling of bare fuel assemblies, was evaluated and eventually adopted in 2006. [31]

[28] Commercial Spent Nuclear Fuel Handling in Air Study, prepared for the US. Department of Energy Office of Civilian Radioactive Waste Management by BECHTEL SARC Company LLC, March, 2005 pages vi, vii, ix

[29] Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, VolumeI-Impact Analyses Chapters 1 through 14, U.S. Department of Energy, June 2008, pages v-vi

[30] Final Supplemental Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada, VolumeI-Impact Analyses Chapters 1 through 14, U.S. Department of Energy, June 2008, 2.1.2.1.4 Wet Handling Facility, Page 2-22

[31] Evolution of repository and waste package designs for Yucca Mountain disposal system for spent nuclear fuel and high-level radioactive waste, Rob P. Rechard, Michael D. Voegel, 2013

	The evolution of the Yucca Mountain project design from repackaging at the repository site to repackaging at the reactor site illustrates the importance of the NWMO including an examination of this alternative means of carrying out their project. The revised IPD or detailed project description must include an evaluation of transferring the fuel waste into the "final" used fuel container at the reactor station, thereby removing the necessity of a "used fuel packaging plant" at the repository site and so greatly reducing worker exposures and site contamination.
In-water transfer of used fuel at repository site	A second alternative means related to the transfer of the used fuel into the final containers would be the use of in-water transfers at the repository site. As per the above, the Yucca Mountain DGR project evolved away from transferring wastes at the repository site to transferring wastes as the reactor site, but in addition to thus eliminating the reliance on hot cells (for "in air" transfer) for the majority of the waste transfers, U.S. DOE also added a "Wet Handling Facility" which would respond to any remaining need for transfer of waste into canisters underwater. This "alternative means" should be explored both as an alternative to the high-volume use of hot cells for waste transfer as a result of NWMO's decision to carry out waste transfers at the repository site rather than at the reactor station, but also as a facility available at the repository site emergencies and contingencies when unplanned transfers might be required.
Mining methods	The NWMO's IPD states that "the current plan is that the shafts will be sunk and excavated using a controlled drill and blast mining excavation technique" and that "grouting will be used as needed to manage groundwater inflows". It also states that "the NWMO is monitoring developments in mechanical excavation mining techniques and may switch to alternative methods that do not use explosives if they become available, are practically feasible (e.g., suitable for expected geological conditions) and economically achievable."[32] The NWMO states that it also intends to use the drill and blast" technique for the creation of the underground service areas, tunnels, emplacement areas and emplacement rooms.[33] Northwatch contends that those "alternative methods" should be presented in the IPD and then in great detail in the Impact Statement as "alternative means" of carrying out the project. Drill and blast mining is the standard excavation technique in surface and underground mining. It utilizes patterned drilling and controlled explosives to fragment hard rock for removal. Holes are drilled - typically 10-40m deep – and charged with explosives and then detonated.

[32] IPD, page 61
[33] IPD, pages 61, 63, 64

	Excavation Damage Zones are a key concern in the design and development of deep geological repositories for radioactive wastes because the extent of the damage affects the ability of the geological formation to serve as a barrier or retardant to the release of radionuclides to groundwater and eventually to surface water. The Excavation Damage Zone (EDZ) is the region of rock surrounding an underground opening where mining or tunneling causes irreversible changes, including fracturing, stress redistribution, and increased permeability. The EDZ is created by the redistribution of in situ stresses, stress unloading, and the mechanical impact of blasting or drilling. Areas affected experience significant damage, including the propagation of existing fractures and the initiation of new ones, often leading to reduced strength and increased hydraulic conductivity. There are generally three zones: the Highly Damaged Zone (HDZ) is the innermost, severely fractured area closest to the opening, the Inner EDZ (EDZi) which is characterized by interconnected, dilated fractures, and the Outer EDZ (EDZo) which is further away, featuring limited, non-connected damage. Excavation Damage Zones in nuclear waste repositories are the fractured, altered rock surrounding underground openings caused by excavation-induced stress redistribution. It increases hydraulic conductivity, potentially acting as a radionuclide transport pathway. Permeability in the EDZ can be up to two orders of magnitude higher than undisturbed rock. The EDZ is a crucial factor in the long-term safety of deep geological repositories because it can bypass the natural geological barrier. NWMO's IPD does not include a single reference to Excavation Damage Zone's, despite the significance of EDZs in the ability of a repository or repository section to provide containment. A thorough examination of alternative mining techniques must be included in the revised IPD or Detailed Project Description, with the investigation and reporting of that investigation carried out in reference to Excavation Damage Zones and the relative merits or hazards of the techniques explored in terms of their ability to limit EDZs.
Waste emplacement (in-room vs in-floor)	NWMO's IPD describes the wastes as being placed underground in a "loaded buffer box" which would be placed in a series of parallel, dead-end placement rooms, organized into panels.[34] Later sections describe the buffer box being moved robotically using a "placement vehicle" and then bentonite spacer blocks and gap material being placed around the buffer box.[35] The IPD provides no rationale for the selection of the used fuel container design or the buffer box system, including relative to past Canadian designs which proposed in-floor placement in titanium containers or the current designs in both Sweden and Finland which

[34] IPD page 64
[35] IPD page 74

	utilize vertical deposition holes bored into the floor of tunnels for waste placement. NWMO's "alternative means" presentation should include consideration of other means of placing the waste in the repository, including but not limited to in-floor versus in-room placement.
Used fuel container design	NWMO's 2021 Concept Report describes the Used Fuel Container (UFC) as consisting of a carbon steel inner vessel with a copper coating with a minimum thickness of 3 mm.[36] The IPD does not include a description of the Used Fuel Container, but does include a brief description of the processing of the used fuel container, in which it states that the filled and welded UFC would enter a copper application and machining cell, where the UFC's machined weld area would receive a copper coating.[37] As noted previously, the IPD states that the NWMO's design "follows international best practices" the design of the used fuel container appears to be another variance from that. For example, Sweden's SKB repository design is also for a copper coated container with steel inserts, but the SKB design used a 5 cm thick copper coating, rather than the 3 mm proposed for the NWMO project concept.[38] In other sections of this report Northwatch will comment on NWMO's failure to adequately describe their project and project components in their Initial Project Description but for the purposes of considering alternative means of carrying out the project a key component is the design of the used fuel container. NWMO must be required to investigate and report on alternative designs for used fuel containers and report in the revised IPD or Detailed Project Description. It would be helpful if the report included a comparison to UFC designs being utilized by other advanced repository programs, such as in Sweden and Finland.

[36] NWMO, Deep Geological Repository Conceptual Design Report Crystalline / Sedimentary Rock APM-REP-00440-0211-R000, September 2021, page 163
[37] IPD page 73
[38] https://skb.com/future-projects/the-spent-fuel-repository/our-methodology/

4.2 Description of the Project and Project Activities

4.2.1 Description of the Project

As the NWMO sets out in the executive summary of their Initial Project Description, their deep geological repository proposed for the Revell site in Treaty 3 territory in northwestern Ontario includes several major activity sets including:

- an underground repository where used fuel will be placed
- surface facilities for receiving, handling, and packaging the used fuel (the "Used Fuel Packaging Plant")
- transportation activities along the primary and secondary access roads within the Project site (excluding transportation from the reactor stations to the proposed repository site)
- supporting infrastructure (in this section the NWMO includes access and haul roads, a rail spur, transmission line, a worker accommodation camp, and an excavated rock management area and excludes low and intermediate level radioactive waste storage areas and systems, retention and holding ponds for storm and "waste" water including contaminated water from the Used Fuel Packaging Plant and pumped from the underground repository)[39]

In this section – and in several other sections of the IPD – NWMO describes 5.9 million used fuel bundles as being the "projected total inventory of used nuclear fuel estimated to be produced in Canada from the current fleet of reactors to end of life" and uses as its reference the NWMO's 2024 Nuclear Fuel Waste Projections Report (NWMO, 2024), stating that "this projection is based on published refurbishment and life-extension plans for the Darlington and Bruce reactors, and the continued operation of Pickering A reactors (until end of 2024) and Pickering B reactors (until end of 2026), and on NWMO's assumptions used for planning purposes."

As the NWMO will be well aware:

- In January 2024 the Province of Ontario "provided the green light" to proceed with planning for the refurbishment of Pickering Nuclear Generating Station.[40]
- In June 2025 OPG submitted an application to the Canadian Nuclear Safety Commission (CNSC) requesting renewal of the Pickering Nuclear Generating Station's Power Reactor Operating Licence (PROL) for a 10-year term from Jan. 1, 2027 to Dec. 31, 2036. The application includes the request to undertake the planned refurbishment of Units 5 to 8 to continue operation for 30-plus years[41, 42]

[39] IPD page vii
[40] As found at https://www.opg.com/news-resources/newsroom/our-stories/story/opg-celebrates-green-light-for-pickering-refurbishment-heres-whats-next/
[41] As found at https://www.opg.com/power-generation/our-power/nuclear/pickering-nuclear/
[42] As found at file:///C:/Users/brenn/Downloads/P-CORR-00531-23980_FINAL-ua.pdf

- in November 2025 the Ontario government announced that it has approved Ontario Power Generation's (OPG) plan to refurbish four CANDU nuclear reactors at the Pickering Nuclear Generating Station[43] approving a $26.8-billion expenditure for the Pickering nuclear plant refurbishment[44]

Presenting the NWMO's 2024 Nuclear Fuel Waste Projections Report – which excluded refurbishment and a 30-year extension of operation for four reactors at Pickering - is both misleading and disingenuous (that is, unless it is simply an indicator of incompetence; we will refrain on commenting on which would be worse).

As a starting point, the NWMO has misrepresented the fuel waste inventory, upon which repository size, years of operation, and resulting degrees of risk and contamination all hinge.

Further, the IPD is silent on the several "small modular reactors" proposed or under development[45] and the three large new nuclear projects currently under review by the Impact Assessment Agency of Canada and the Canadian Nuclear Safety Commission (Bruce C Nuclear Project,[46] Peace River Nuclear Project,[47] and Wesleyville Nuclear Project[48]). In other venues the NWMO has stated that the inventory from new nuclear projects can be accommodated in the "APM" project, meaning in the repository now proposed for the Revell site between Ignace and Dryden in northwestern Ontario. For example, in their submission with respect to the Initial Project Description for the Bruce C Nuclear Project the NWMO wrote:

> *Adaptive Phased Management emerged from a three-year dialogue and engagement with Canadians and Indigenous peoples. The approach is flexible and can adapt to a number of future used fuel scenarios in Canada, including the introduction of new nuclear power generation technologies in Canada.*
>
> *The NWMO is obliged under the Nuclear Fuel Waste Act to offer its services, without discrimination and at a fee that is reasonable in relation to its costs of managing the nuclear fuel used fuel to all owners of nuclear fuel waste produced in Canada. Nuclear fuel waste includes the irradiated fuel removed from any commercial or research nuclear fission reactor in Canada, including SMRs and new and emerging technologies.*
>
> *By the end of 2024, the NWMO is expected to select a site for a deep geological repository for Canada's used nuclear fuel, with a willing host municipality and First Nation. . Both*

[43] As found at https://news.ontario.ca/en/release/1006772/ontario-greenlights-pickering-nuclear-generating-station-refurbishment-to-create-nearly-37000-jobs
[44] As found at https://www.theglobeandmail.com/business/article-ontario-approves-268-billion-pickering-nuclear-plant-refurbishment/
[45] See https://www.opg.com/projects-services/projects/nuclear/smr/darlington-smr/
[46] See https://iaac-aeic.gc.ca/050/evaluations/proj/88771?culture=en-CA
[47] See https://iaac-aeic.gc.ca/050/evaluations/proj/89430
[48] See https://iaac-aeic.gc.ca/050/evaluations/proj/89802

sites being considered for Canada's used nuclear fuel repository have, from a geological perspective, the capacity for expansion and we are confident that both could house the used fuel from existing reactors and from announced new nuclear projects. Emplacement of the waste is technically feasible in either location.[49]

Later in the same letter the NWMO states that "to maintain flexibility, the NWMO is also exploring the potential to include future used fuel from small modular reactors (SMRs) and other new nuclear in the same repository that we will use to manage the intermediate-level waste and non-fuel high-level waste." Northwatch notes that while developing and implementing a deep geological repository for low and intermediate level radioactive waste is outside the mandate provided the NWMO through the Nuclear Fuel Waste Act, the addition of high-level nuclear fuel waste to the repository the NWMO recommended as part of the Integrated Strategy for Radioactive Waste[50] is outside the strategy recommended to and endorsed by the Minister.[51]

Again, the NWMO has misrepresented the fuel waste inventory, upon which repository size, years of operation, and resulting degrees of risk and contamination all hinge.

4.2.2 Project Activities

Overall, we found the NWMO's Initial Project Description to be poorly thought out and a curious combination of gaps and repetitions; some text appears repeatedly, while some key descriptions of NWMO project activities are either omitted or treated only very superficially.

To provide a more coherent review of the IPD's description of project activities our approach will be to discuss key activity areas chronologically (in the order they will occur in the project's development and implementation). In some instances, we have addressed a recurring or ongoing project activity – such as construction of tunnels and emplacement rooms – in only one section despite it occurring in more than one period (for example, construction of tunnels and emplacement rooms will occur in both the "construction" period and the "operating" period.

[49] NWMO comments on Initial Project Description for the Bruce C Nuclear Project, Ref #82, dated October 24, 2024, as posted at https://iaac-aeic.gc.ca/050/evaluations/proj/88771/contributions/id/62105

[50] As found at https://www.nwmo.ca/-/media/Reports-MASTER/Corporate-reports/Integrated-Strategy-for-Radioactive-Waste-2023.ashx?sc_lang=en&rev=e3f7279036964697a15774a1478bb457&hash=A07BDA73C843F3299C050CBA537B3FC5

[51] As found at https://natural-resources.canada.ca/energy-sources/nuclear-energy-uranium/statement-integrated-strategy

4.2.2.1 Transfer of Wastes at Nuclear Generating Stations

The NWMO has persistently excluded the first step in their project – the transfer of the used fuel waste from dry storage containers into transportation containers at the reactor site – and have done the same in the Initial Project Description.

NWMO has generally attempted to dodge this important topic by saying something to the effect of "that's up to the waste owners", which is unconvincing as the waste owners – Ontario Power Generation – comprise the majority of the NWMO and in 2024 provided 94% of the budget as the owners of more than 90% of the waste. The transfer of the wastes at the reactor station must be considered as part of the project as the methods and observations made during the transfer of the wastes are likely to have bearings on the condition of the fuel as it arrives at the repository site, and subsequently on key safety issues like levels of radioactive release and worker exposure (fuel defects are a precursor to dose; if the fuel bundles are found to be defective or damaged during observation or testing this is of consequence at the repository site. Similarly, if the fuel bundles are damaged or made defective during the transfer, this will be of consequence at the reactor site).

Northwatch has previously investigated the dry storage of used fuel waste at Ontario nuclear generation stations, including as contributions to licence renewal hearings for the waste management facilities. The findings of our technical expert included:

- the state of each fuel bundle before storage was not qualified
- there was no confirmation that the long stored spent fuel has been kept below allowable maximum temperatures
- there was no confirmation that the waste was still intact and is going to be amenable to retrieval
- the defective fuel detection system at Darlington is limited to the on-reactor system
- the on-line Gaseous Fission Product Detection System was largely operationally ineffective due to legacy design error issues with the electronics and detector assembly system for a long period of time so some defective fuel may be stored but unidentified in dry storage casks
- dry storage casks are not monitored individually
- the Dry Storage Casks design has storage geometries that are unsuitable for effective heat removal
- the Dry Storage Casks design will allow retention of larger than anticipated quantities of water after vacuum drying
- the retention of water in the dry casks can cause undue oxidation and hydrogen intake over the years which can cause potential fuel sheath failures

- the dry storage casks should be – but are not – equipped with newly developed instrumentation and analytical techniques to detect any changes in thermal and gamma/neutron profiles.[52]

The condition of the wastes in storage at the reactor stations and the handling of the wastes during transfer into the transportation container are of consequence to the operations at the repository site and the safety of those operations.

The separation that NWMO is attempting to draw between the transfer of the fuel wastes at the reactor stations and the transportation of the wastes from the reactor stations is a false one. Just as the transportation of the wastes would not occur in the absence of the project to place the wastes in the repository, the transfer of the wastes from dry storage into the transportation containers would not occur absent the project to place the wastes in the repository.

Finally, as set out in Section 4.1.3 *Alternatives Means of Carrying Out the Project* of this submission, the NWMO must be required to examine the *alternative means* of placing the used fuel in a "final container" at the reactor station (referred to in the NWMO concept as the "fuel container) rather than in a transportation container (referred to in the NWMO concept as the Used Fuel Transportation Package and the Basket Transportation Package)[53] for transport to the site and subsequent transfer from the transportation container / package into the final used fuel container.

4.2.2.2 Transportation of Wastes from Nuclear Generating Stations to Proposed Repository Site

4.2.2.2.1 NWMO Attempt to Exclude Transportation from the Impact Assessment

In the Initial Project Description, the NWMO pronounces that their current project, the subject of the current impact assessment process, does not include transportation of used fuel from reactor sites to the Project (beyond primary and secondary access roads at the Project site).[54]

> *The transportation of nuclear materials (i.e., used nuclear fuel) and non-nuclear materials within established transportation corridors is not considered and (sic) incidental activity to the Project. This is because these activities are ongoing, independently regulated, would not require changes to federal or provincially approved design standards for existing*

[52] See CMD 23-H9.24 – Submission from Northwatch (PDF, 85 pages, 3.91 MB)

[53] NWMO, Deep Geological Repository Transportation System Conceptual Design Report Crystalline / Sedimentary Rock, APM-REP-00440-0209 R001, September 2021, as found at https://www.nwmo.ca/-/media/Reports---Reports/APMREP004400209.ashx?sc_lang=en

[54] IPD page vii

highways and railways and these activities are expected to continue regardless of the Project's implementation.[55]

This assertion by the NWMO that long-distance transportation is not part of the project is erroneous on three counts:

- The Impact Assessment Act sets out that its application is to designated projects and to activities and effects with are "incidental" to those projects
- Even within the Initial Project Description there are statements that clearly support the determination that long-distance transportation is part of the project and therefore subject to the impact assessment process initiated on January 5th
- The NWMO has been describing transportation as part of the APM project for 20 years, including in the Choosing a Way Forward report which is the basis of the federal government allowing NWMO to proceed with this project

4.2.2.2.2 Provisions of the Impact Assessment Act

The purpose of the Impact Assessment Act is to "prevent or mitigate significant adverse effects within federal jurisdiction — and significant direct or incidental adverse effects — that may be caused by the carrying out of designated projects".[56]

The definitions section provides further clarity, stating that a "designated project … includes any physical activity that is incidental to those physical activities"

The "Summary of Federal Incidental Activities and Provincial Required Assessment Matters Analysis" for the GCT Deltaport Expansion – Berth Four Project, dated June 30, 2022[57] further adds to these clarifications:

An incidental activity is an activity that is likely to happen in conjunction with a project proposed by a proponent, meaning that it becomes part of the designated project and must be assessed. Incidental activities are considered in the federal decision-making phase, including the federal public interest determination, and if a project is allowed to proceed, incidental activities can be subject to conditions in a decision statement.

NWMO's argument rests on their faulty reasoning that the long-distance transportation is not an incidental activity to the Project "because these activities are ongoing, independently regulated, would not require changes to federal or provincially approved design standards for existing

[55] IPD page 50
[56] Impact Assessment Act, Section 6 (1)
[57] As found at https://iaac-aeic.gc.ca/050/documents/p81010/144292E.pdf

highways and railways and these activities are expected to continue regardless of the Project's implementation."

This is a discountable argument on several counts including:

- The long-distance transportation of high-level nuclear fuel waste is not an ongoing activity.
- The NWMO has stated that an average of five single fuel bundles are transported per year in Canada, primarily shipments from nuclear generating stations to the Chalk River Laboratories for research purposes. This is distinctly different from the NWMO's future transportation plans which will involve an estimated 650 shipments per year over 50 years (approx. 2-3 per day). A single transportation package can carry up to 192 used fuel bundles.
- The long-distance transportation of nuclear fuel waste that will be carried out incidental to their APM project is unprecedented, rather than "ongoing".
- Most if not all projects assessed under the IAA are also subject to other laws and regulations; the "permitting plan" developed in the planning phase of the Impact Assessment Process is obvious evidence of this
- Changes to design standards for project infrastructure is not a determination as to whether an activity is incidental to a project

The Agency considers several factors to determine if an activity is part of the "designated project"

Relationship to Project: Whether the activity is subordinate, complementary, or required for the primary designated project.	The long-distance transportation of the nuclear fuel waste from the reactor stations to the repository site is required for the APM project; if the waste was not transported to the site, there would be no waste with which to carry out the primary project activity, i.e. the placement of the wastes in the deep geologic repository
Control/Influence: Whether the activity is under the care and control of the proponent, or if the proponent can direct or influence a third party to carry it out.	The activity of long-distance transportation of the waste is under the direct care and control of the NWMO. As reported in their 2001 *Deep Geological Repository Transportation System* *Conceptual Design Report, Crystalline / Sedimentary Rock*[58] "it is assumed that ownership and operations

[58] NWMO, Deep Geological Repository Transportation System Conceptual Design Report, Crystalline / Sedimentary Rock, APM-REP-00440-0209 R001, September 2021, page 11

	of the transportation system are retained by NWMO".
Benefit: Whether the activity is exclusively for the benefit of the project proponent.	The activity is exclusively for the benefit of the proponent and the proponent's shareholders (Ontario Power Generation, Hydro Quebec and New Brunswick Power) in that it removes the waste from the shareholders liabilities and it makes the implementation of the NWMO's project possible.
Physical Connection: Whether the activity is closely linked physically or functionally to the main project.	The long-distance transportation of the nuclear fuel waste from the reactor stations to the repository site is the physical link between the current waste location and the repository location; the main project cannot function absent the availability of the waste.
Regulatory Context: Relevant federal or provincial regulatory requirements for the activity.	The regulation of the deep geological repository and the long-distance transportation of the radioactive fuel waste are both matters of federal regulation.

4.2.2.2.3 NWMO's Initial Project Description Statements on Long-Distance Transportation

Even within the Initial Project Description there are statements that clearly support the determination that long-distance transportation is part of the project and therefore subject to the impact assessment process initiated on January 5th. These include the following:

- The NWMO organized a cross-jurisdictional transportation working group to seek input from provinces and federal government on the early development of transportation technical and engagement program. (page 33)
- The NWMO organized a cross-jurisdictional transportation working group to seek input from provinces and the federal government on the early development of the transportation technical and engagement program. The NWMO has sought government datasets to support technical route assessments (page 34, 35, 36)
- Based on annual shipping (receipt) assumptions, the maximum number of certified transportation packages received at the UFPP in any given year is estimated to be approximately 625 Used Fuel Transportation Packages (UFTPs) and 260 Basket Transport Packages, respectively (each UFTP holds 192 used fuel bundles whereas the Basket Transport Package holds up to 120 used fuel bundles). (page 73)
- Used fuel arrives (approximately two trucks per day) at the UFPP from the interim storage sites (page 73)

- There would be a need for transportation containers and facilities to produce them; processing facilities to load the fuel into transportation containers; production facilities for deep repository containers; processing facilities to transfer the fuel from transportation to deep repository containers; and production facilities for sealing materials. (page 77)
- The operation of the centralized facility would involve moving the fuel from existing reactor site storage facilities in certified transport containers to the central site. Transportation would require an emergency response plan and adherence to security provisions. The mode of transportation (road, rail or water) would depend upon the location of the central facility and other factors. (page 77)
- The operation of the centralized facility would involve moving the fuel from existing reactor site storage facilities in certified transport containers to the central site. Transportation would require an emergency response plan and adherence to security provisions. The mode of transportation (road, rail or water) would depend upon the location of the central facility and other factors (page 84)
- Similarly, the public should be safe from the threat of injuries or deaths due to accidents during used nuclear fuel transportation or other operations associated with the management of used nuclear fuel. (page 85)
- Implications for the well-being of all communities with a shared interest (including host community, communities in the surrounding region and on the transportation corridor, and those outside of the vicinity who feel affected) should be considered in the selection and implementation of the management system and related infrastructure. (page 86)
- Following consideration of social and cultural perspectives and preferences, technical suitability, transportation safety and First Nation/municipal community willingness, this location was ultimately selected for the Project. (page 95)
- Mitigation Protection and Enhancement Measures: Communicate transportation plans with WLON, the Township of Ignace and other local communities. (page 215)
- Project activities during site all Project phases, including site traffic, transportation of materials to and from the site, employment and procurement (page 246)

With the exception of the NWMO's unsupported assertion that long-distance transportation is not part of the impact assessment process, the many transportation-related statements in the IPD and the reliance of the project on the fuel waste being transported to the site in order to carry out the project confirm that transportation is very much part of the project and therefore must be examined during the impact assessment process.

4.2.2.2.4 NWMO Project Descriptions Includes Long Distance Transportation

The NWMO has been describing transportation as part of the APM project for 20 years, including in the Choosing a Way Forward report which is the basis of the federal government allowing NWMO to proceed with this project.

Additionally, the Nuclear Fuel Waste Act – the legislation which provided the nuclear industry with a mandate to operate as the Nuclear Waste Management Organization – defines management, in relation to nuclear fuel waste, as "including handling, treatment, conditioning or transport for the purpose of storage or disposal".

The following table lists a sampling of documents which describe the NWMO project and clearly include transportation as part of the NWMO project. See Appendix 1 for this listing with excerpts from each document.

Source (document, presentation)	Date
Nuclear Fuel Waste Act	June, 2002
ADAPTIVE PHASED MANAGEMENT, TECHNICAL DESCRIPTION Nuclear Waste Management Organization	October, 2005
Choosing a Way Forward The Future Management of Canada's Used Nuclear Fuel Final Study, NWMO, 2005	November, 2005
Ensuring Safe Transportation of Used Nuclear Fuel, Background 2010	May, 2010
Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise	October, 2012
Assessing Radiological Dose to Members of the Public and Workers during UFTP Transportation, NWMO-TR-2015-17	September, 2015
Technical Program for Long-Term Management of Canada's Used Nuclear Fuel – Annual Report 2018, NWMO-TR-2019-01	December, 2019
NWMO Presentation to the Canadian Nuclear Safety Commission, Commission Meeting, April 2021	April, 2021
NWMO Presentation to the Canadian Nuclear Safety Commission, Commission Meeting, April 2021	April, 2021
Deep Geological Repository Transportation System Conceptual Design Report Crystalline / Sedimentary Rock, APM-REP-00440-0209-R001	September, 2021
Preliminary transportation plan December 2021 (NWMO)	December, 2021
Confidence in Transportation Package Performance, APM-REP-04220-0209-R000	September, 2023
Confidence in Safety – Revell Site – 2023 Update NWMO-TR-2023-07 December 2023	December, 2023
CANADIAN NATIONAL REPORT for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 8th Report	August, 2024
Protocol among Canadian Nuclear Safety Commission, Impact Assessment Agency of Canada, and Nuclear Waste Management Organization, Version 2.0	September, 2024

4.2.2.3 Processing of the Used Fuel in the Used Fuel Packaging Plant

Discussion of the Used Fuel Packaging Plant appears in two sections of the Initial Project Description, those being the section titled "9.5.2 Listing of Major Construction Activities" and "9.6.2 List of Major Activities During Operations". It is appropriate that the sections are titled "listing" and "list" of activities, as they are very much more a listing than a description. What is missing from the document is an actual description of the Used Fuel Packaging Plant and its operations, anticipated radiological releases, and risks to workers and the environment.

Section 9.5.2 is very brief, only 200 words, and as large a portion of the text is spent describing Posiva's facility in Sweden as it is describing the NWMO's conceptual design for the used fuel packaging plant proposed as part of their APM project.

The only actual description of the activities in the UFPP contained in this section is as follows:

> *The used nuclear fuel will be received from interim storage sites at the UFPP. The UFPP will incorporate multiple robotic/remote processing systems contained within hot cells (containment structures) to remove the used fuel from the transportation package and repackage it into the UFCs that will be emplaced in the DGR.*

In this section NWMO states that "hot cells have been used in numerous nuclear facilities worldwide and are recognized for their effectiveness in protecting workers and the environment from radiation exposure (IAEA 2013)" but omits two directly points:

- The proposed scale of use of hot cells is unprecedented in Canada, where hot cells have been used on a very small scale and primarily for research purposes; there is no operational experience in Canada with the use of hot cells on this large industrial scale
- The majority of facilities where hot cells have been used on a large scale – primarily related to weapons production and reprocessing - are now highly contaminated sites; key locations with significant, long-term operations that are also highly contaminated sites include the Idaho National Laboratory in the U.S.A., the La Hague Site in France, and Sellafield in the U.K.

The NWMO points to hot cells being "a key feature of the Posiva facility in Finland, particularly within the Onkalo DGR, which serves as an international reference point for the final disposal of spent nuclear fuel (IAEA 2012)" but omits that Posiva's deep geological repository in Finland is still in the licensing stage and has no operational experience upon which to draw. The license application was filed in 2021 and its has been the subject of at least two time extensions; it is unclear at this point how many more years it will be until operations are licensed, and it will take a considerable period of time after operations begin before any conclusions can be drawn about the ONKALA operation of hot cells and whether that operation provides any useful experience to apply to the Canadian setting.

The IPD identifies that the UFPP design will include ventilation and a "nuclear grade ventilation system for the hot cells" but does not describe them.[59] These are parts of the operation that are fundament to assessment health and safety conditions and risks and must be described in detail.

In Section 9.6.2 most of the text is a generic description that could be applied to any facility, such as indicating that there will be **"**quality control and performance monitoring systems" and "Safeguards measures … incorporated into the facility design" but these systems and measures are not described.

The section also includes very general descriptions of emplacement activities and generic statements such as "these activities are completed to isolate the radiological hazard associated with used fuel from humans and the environment." While that is an expected objective, it is not useful as a generic statement and is meaningless without a sufficiently detailed description of how the activities will be carried out and what radiological hazards may be generated or encountered during the carrying out of those activities.

The actual 148-word description of the activities to be carried out in the processing facility is as follows:

> *Used fuel currently stored at interim storage facilities would arrive at the Project site in a certified transportation package. The packages would be received at the UFPP, disassembled in a hot cell (exposing the contained used fuel) and the used fuel transferred to the UFC. Empty UFCs would be received at the UFPP from an off-site manufacturing plant. The received UFCs would be substantially completed prior to arriving at the DGR and include an insert, a shell with integral bottom and corrosion barrier and a separate UFC head with its corrosion barrier.*
>
> *The throughput of Canada Deuterium Uranium used fuel encapsulated in UFCs is expected to be 120,000 fuel bundles per year. Utilizing the current reference UFC design with a capacity of 48 Canada Deuterium Uranium used fuel bundles, the throughput required for both the UFPP, and the underground emplacement is estimated to be 2,500 UFCs per year.*[60]

This section also describes the UFPP operations as being a generator of liquid and solid low and intermediate level radioactive wastes, but provides no characterization of these wastes or describe their management. This issue will be discussed in a later section of Northwatch's submission.

Prior to the publication of the 2021 *Deep Geological Repository Conceptual Design Report Crystalline / Sedimentary Rock*[61] the NWMO provided extremely limited information about the

[59] IPD page 59
[60] IPD, pages 66-67
[61] NWMO, Deep Geological Repository Conceptual Design Report Crystalline / Sedimentary Rock

used fuel packaging plant, generally identifying it as one of the "surface facilities" and excluding detailed descriptions, particularly with respect to the radiological releases and risks that would be associated with the operation. There were two presentations in 2020 to the South Bruce Community Liaison Committee; there is no record of a presentation to the Ignace CLC on this topic.

At the time of publication of the 2021 *Conceptual Design Report* Northwatch was critical of the limited information provided in that report, the conceptual nature of the facilities design, and the lack of a clear timeline for the NWMO making more detailed information. Five years later, the 2021 concept report remains the primarily information source about the used fuel packaging plant, despite its limited and conceptual nature.

We have fully anticipated that the Initial Project Description would provide that more detailed and updated description of the Used Fuel Packaging Plant. It fully fails to do so, instead providing only a very generic subset of the information that was provided in 2021.

Information included in the 2021 *Deep Geological Repository Conceptual Design Report Crystalline / Sedimentary Rock* that should have been expanded upon and updated includes:

- Monitoring and decontamination of radiological and non-radiological contaminants
- A description of the zoning within the Used Fuel Packaging Plant, and in parituclar of Zone 4, where the hot cells will be located
- The system to detect, monitor and record any airborne or waterborne releases of radioactivity leaving the site.
- The environmental monitoring system
- The system to detect, monitor and record any airborne or waterborne releases of radioactivity leaving the site.
- The generation of liquid and solid low and intermediate level radioactive wastes and their short, medium and long-term management

Particular concerns arose during our 2021 review of the *Conceptual Design Report*, including with respect to the stated intention of the NWMO to use a licensed dosimetry service to measure and monitor the doses of personnel but only those "who have a reasonable probability of receiving a dose greater than 5 mSv in a one-year dosimetry period".

The revised IPD or Detailed Project Description should describe the NWMO's intended monitoring program in all aspects, including the scope of their monitoring program – including for workers – and the rationale for its design and scope.

APM-REP-00440-0211-R000, September 2021, N. Naserifard, A. Lee, K. Birch, A. Chiu, and X. Zhang, Nuclear Waste Management Organization

Related to the above, of specific concern with the Used Fuel Packaging Plant is the release of radio-contaminants to the indoor and outdoor environments and the risk those releases pose to worker / human health and the environment. This topic – central to the safety of the NWMO's project - is fully omitted from the IPD and was insufficiently addressed in the 2021 *Conceptual Design Report*.

A paper presented by the NWMO in 2011 provides some indicators of the type of information that was omitted first from the 2021 Concept Design Report and even more germanely from the 2025 Initial Project Description. Northwatch has only been able to obtain an abstract of the paper – we note that the NWMO withholds many of the paper and research reports it produces, both from the "reports" section on its web site but also in response to direct and specific requests from the public – but it does identify relevant information.

The paper, *Dose Considerations for a Site Boundary for Surface Operations at a Deep Geological Repository*[62], by E.P. Kremer (Nuclear Waste Management Organization) and N.C. Garisto (SENES Consultants Limited) includes the following:

- Normal Operations of the repository surface handling facilities may result in emissions of radioactivity, for example from routine used fuel receipt from transportation and re-packaging into long-lived containers.
- Anticipated Operational Occurrences are considered outside the range of normal operations but are assumed to occur with frequencies of at least 10^{-2} per year.
- Anticipated Operational Occurrences considered in the assessment included Irradiated Fuel Transportation Cask carrying water from an Irradiated Fuel Bay; significantly longer transportation or staging times; increased processing load; a 5-fold increase in pre-existing fuel sheath failures; and failure of the ventilation exhaust filtration system.
- Design Basis Accidents are outside the range of Anticipated Operational Occurrences and are assumed to occur with frequencies of between 10^{-2} and 10^{-5} per year.
- Design Basis Accidents considered in this assessment are scissor lift failure causing an Irradiated Fuel Transportation Cask to fall, and overhead carriage failure causing one used fuel module to fall on another module.

We present the above to illustrate the discussion areas that are relevant and should be included in the IPD; in so doing we are neither debating nor accepting the frequency estimates as presented.

Consideration of this single one-page abstract illustrates several major omissions from the Initial Project Description, including:

[62] DOSE CONSIDERATIONS FOR A SITE BOUNDARY FOR SURFACE OPERATIONS AT A DEEP GEOLOGICAL REPOSITORY, E.P. Kremer, Nuclear Waste Management Organization, Toronto, Ontario, Canada and N.C. Garisto, SENES Consultants Limited, Richmond Hill, Ontario, Canada, presented at Waste Management, Decommissioning and Environmental Restoration lor Canada's Nudear Activities September 11·14, 2011, APM-REF-01917-26229

- Discussion of dose
- Calculation of methods and basis for calculating dose at the site boundary
- Discussion of accidents and potential consequences for all stages of the project and all project activity groups

4.2.2.4 Emplacement of Wastes in the Deep Geological Repository

The organization of the IPD is such that description of activities – such as emplacement in the repository – are scattered throughout the document; in some cases this causes repetition, and it certainly makes it more challenging to evaluate the gaps in the information provided.

For this review the Northwatch provides comments on the descriptions provided on pages 62 through 68 of the IPD, within the context of having reviewed the entire document.

- The IPD includes a brief description of sumps to operate in the repository, but does not describe volume, or the contaminants for which the sump water would (or may) have to be treated
- The IPD states that "the placement rooms of the underground repository are constrained by the naturally occurring rock fracture network" and indicates that the Geoscience Verification Plan (which is not provided) and additional characterization work (which is not described) will "ensure that where applicable, the placement arms are sufficiently far from these fractures"; this is a key safety factor, particularly in terms of long-term safety (the ability of the repository to actually contain and isolate the waste) and must be addressed in much greater detail, including by outlining:
    - The independent oversight that will be brought to the geoscience verification work, and the level of transparency that will be in place to allow public oversight as well as expert oversight
    - Continency planning and contingency plans and how they will be implemented during operations (for example, when the degree of rock fracturing is greater than anticipated)
    - Clear failure thresholds, i.e. what is the measure that will be used to determining that the fracturing is to such a degree that placement (of tunnels, placement arms or placement rooms) cannot proceed
- The IPD lists the infrastructure that would be excavated and installed as a part of construction activities in the central services area including "office, lunchrooms and refuge station"'; much more detail is required with respect to the refuge station(s), including the rationale behind their placement, their capacity (both for in terms of time and number of workers who can be accommodated) and means of access

- The IPD provides no timeline for the development of the first two shafts, or for the development of the third shaft, or a rationale for the selected timing and sequencing of shaft development
- As noted elsewhere in these comments, the selection of "controlled drill and blast" as the mining method is not provided, nor is the selection of this technique discussed in the context of what measures would be applied in its use to limit the Excavation Damage Zone
- The IPD does not describe in sufficient detail how emplacement and construction activities could occur concurrently in a safe manner that protects workers health and safety
- The IPD states that "to the degree possible, the subsurface ventilation system is expected to be set up to ensure that underground work is performed in a fresh air supply stream with the exhaust being directed through unoccupied areas"; the qualifier "to the degree possible" warrants explanation; the statement suggests that this may not be possible, and underground work would be performed without a fresh air supply; the IPD needs to describe these circumstances in more detail, including clarifying whether the work being done without a fresh air supply is construction work being carried out by human workers or emplacement work being carried out robotically
- The IPD should state how many placement arms are anticipated and the basis for that calculation, i.e. availability of unfractured rock, volume of waste, or other factors

- The IPD states that "the placement room dimensions are determined by the loaded buffer box size" but doesn't a) state the dimensions of the buffer box, b) indicate whether the buffer boxes will be stacked, or c) indicate the anticipated depth of the placement room, i.e. how many buffer boxes can be accommodated from back to front (the "front" being the entry to the placement room from the tunnel or emplacement arm)

- The very brief description of the "Underground Footprint" of the DGR should be supported with a detailed drawing

- The IPD refers to "special equipment" but does not describe the equipment of it specific purpose (beyond saying it is for "testing or monitoring")

- The IPD states that " a large permanent refuge station would be established in the central service area" but as noted above much more detail is required with respect to the refuge station(s), including the rationale behind their placement, their capacity (both for in terms of time and number of workers who can be accommodated) and means of access

- The IPD describes the refuge stations as providing a "safe location" in the event of an "abnormal event" but does not describe or define "abnormal events" or provide any discussion of likelihood, potential severity, or possible duration

- The IPD states that in addition to the main refuge station in the central area, portable refuge stations would be established at suitable locations in each arm of the repository within crosscuts that connect the twin access tunnels of each arm; the same questions apply to the portable refuge stations as noted above with respect to the "large permanent" refuge station

- The IPD suggests (on page 676) that the UFC must be "confirmed to meet requirements for movement underground" but we could not find a description of those requirements in the IPD

- The IPD references shielding and remote handling processes indicated that they are required to to prevent workers from being exposed to radiation, but fails to:

    - Describe the shielding
    - Describe the remote handling methods
    - Indicate from where the remote handling would be carried out (i.e. from the central service area, from a surface facility, or from an off-site location)
    - The source and level of the radiation to which the workers would be exposed in the absence of the shielding and remote handling techniques
- The IPD very briefly states that "the loaded buffer box assembly is placed into the placement room" but does not describe:
    - How the boxes will be placed (both the geometry of the placement and the method of placement are omitted)
    - If a "buffer box assembly" is different than the "buffer box" referenced elsewhere in the document; we note that this is the single and only reference to a "buffer box assembly"
- The IPD references an "engineered seal" but does not describe that "seal"
- The IPD indicates that "concrete and bentonite are proposed" to be used for the sealing of the placement room; a full description should be provided, and should clarify if this refers to a concrete and bentonite mix to be used as sealing material, or if it refers to a bentonite seal and a concrete barrier, and the functions of each (if that is the case)
- The monitoring program for the placement rooms needs to be described in much more detail, including detail with respect to:
    - The method of in-room monitoring during placement activities (for examples, which particulates and which radionuclides will be monitored, and will the monitoring be effective for alpha as well as gamma radiation)

    - The method of monitoring in emplacement arms and tunnels
    - The timeline for monitoring in each of placement rooms, emplacement arms and tunnels
- The IPD states that "geological investigation and verification activities are planned to be carried out concurrently with underground development to obtain the geological data needed to confirm the safety of the repository system and to identify geological nonconformities
    - the revised IPD or detailed project description should provide a detailed and cohesive description of the geoscience verification program as carried out during site characterization (pre-construction) and during ongoing construction and operation
    - As indicated earlier in this submission there must be independent oversight of the geoscience verification work, continency planning and contingency plans must be developed and described, and clear failure thresholds must be established and applied (i.e. what is the measure that will be used to determining that the fracturing is to such a degree that development cannot proceed

4.2.2.5 Closure, Decommissioning and Monitoring

The NWMO states repeatedly throughout the IPD that "the Project is expected to last over 160 years, including site preparation, construction, operation, decommissioning and closure, and post-closure monitoring."[63] In two of the six instances it adds additional detail, such as the purported volume limit of 5.9 million bundles and the estimate that the operating period would be "about 50 years".[64]

The IPD does not provide a timeline or time estimate for the decommissioning and closure and post-closure monitoring periods, beyond stating that the sum total of the project period is 160 years.

This IPD does very generally paraphrase the Choosing a Way Forward (2005) report in stating that "once a societal decision was made and the necessary licences were obtained, decommissioning would commence".[65]

What it omits from that approximate re-statement from the 2005 report is the timeline for closure and post-closure monitoring in that report (which was the basis for the Government mandating the NWMO to proceed to siting and DGR design):

[63] IPD, page v
[64] IPD, page 1
[65] IPD, page 85

After closure of the deep repository around 300 years, postclosure monitoring of the facility could take place from the surface[66],[67]

Used fuel is now fully placed in repository. Monitoring will continue until a future society is sufficiently confident that the used fuel will remain contained and isolated.[68]

The approach provides opportunity for citizens, including future generations (at least over the next 300 years), to influence the way in which the fuel is managed[69]

The NWMO's main description of its decommissioning and closure planning is found on pages 68-72 of the Initial Project Description. Northwatch's comments and observations include the following:

- The IPD states that "a period of long-term monitoring is expected to provide further data to demonstrate the long-term safety of the Project" but it provides no definition of safety, and no methodology or criteria by which it will determine that safety has – or has not – been achieved
- The IPD indicates that the long-term monitoring will demonstrate the long-term safety of the project, but provides no definition to "long-term"; this is a central question given the long-lived nature of the hazard and the period of time which may pass prior to the failure of one or more of the barriers; sequential failure of several barriers over a period of decades or centuries is not an unlikely outcome, but would be a relatively short period of time relative to the hazard-life of the materials; in light of this, in future iterations the NWMO must:
    - Define "long term"
    - Discuss their definition of "long-term" in relationship to the proposed monitoring period
    - Discuss their definition of "long-term" in relationship to the life-time of the hazard
    - Describe continency plans and mitigation measures to be applied in the event that the monitoring results indicate that there are unplanned releases and / or unforeseen adverse effects
    - Describe the thresholds for determining that monitoring results indicate that conditions surround the repository are "safe" versus "unsafe"
- As is the case in several sections of the IPD, section 8.7.2 is a listing of decommissioning and closure activities, rather than a description; a detailed description must be provided of each of the listed activities

[66] NWMO, Choosing a Way Forward, 2005, page 27
[67] IPD, page 140
[68] NWMO, Choosing a Way Forward, 2005, page 29
[69] NWMO, Choosing a Way Forward, 2005,, page 31

- The IPD states that following completion of emplacement of Loaded Buffer Boxes (loaded UFCs with bentonite blocks) in the repository, the Project will enter in an extended monitoring phase where the NWMO will continue to monitor the long-term safety and performance of the repository system; the description is inadequate in that it fails to:
    - Describe the monitoring of the used fuel container (which has been placed in the buffer box) and the method for measuring performance of each of the barriers (the UFC and the buffer box) and identify deteriorations or failures in the performance of these barriers
    - Describe the monitoring of the buffer materials and seals and the method for measuring performance of each of the barriers and identify deteriorations or failures in the performance of these barriers
    - Describe continency plans and mitigation measures to be applied in the event that the monitoring results indicate the performance of the backfill and / or seal to the emplacement room is deteriorating or failing
- The IPD states that the NWMO will demonstrate the site's long-term safety during the extended monitoring period (see comments above) and that "*the actual duration of this period will be determined based on society's desire at the time as well as experience from other international DGRs for used nuclear fuel and CNSC oversight*"; this statement is unclear and potentially contradictory; the following clarifications are required:
    - How is "society's desire" defined, who will define it, and who is included in "society" in this context?
    - How does this reference to "society's desire" align with statements from Choosing a Way Forward (see above)?
    - In looking to experience from other international DGRs for used nuclear fuel, what would be the requirement in terms of operating experience – including experience in closure, decommissioning and long-term post-closure monitoring – what would be necessary to utilize that international experience to inform decisions with respect to the long-term monitoring of the Canadian repository?
    - What is meant by "CNSC oversight" in this instance, and how does the issuing of licenses for the decommissioning and then for the abandonment of the site relate to how the "CNSC oversight" informs the duration of the monitoring period?
- The IPD indicates that the extended monitoring phase will include monitoring of barrier parameters such as rock temperature, rock stress/displacement (response to thermal loading), water ingress, placement room seal performance, ground water quality, ground water radioactivity, humidity and acoustic emissions as required; neither the IPD or the 2021 Conceptual Design Report provide sufficient description of these parameters, what is anticipated or acceptable in terms of these parameters (for example, we have found no information from the NWMO on anticipated changes to ground temperatures at repository depth or at surface); as noted in earlier comments, continency plans and

mitigation measures will need to be applied in the event that the monitoring results indicate the performance of the repository is such that monitoring indicates that the results are out of the anticipated or acceptable ranger for one or more parameters

- In describing the *Decommissioning Underground Infrastructure* there is a lack of clarity around which areas can be accessed, and whether some or all areas must be accessed robotically due to continued high levels of radiation; the IPD states in earlier sections that some areas can only be accessed robotically to avoid worker exposures, but it is unclear whether that remains the case through to the decommissioning period or for what time frame the radiation will remain at high levels during and after placement
- The IPD states that "for planning purposes, final decommissioning is expected to occur about 100 years after repository construction" and that "for planning purposes, it is assumed the decommissioning and closure phase will require about 30 years"; this statement needs clarification; it is unclear if "after repository construction" indicates after the beginning of construction (some time prior to the commencement of the operating period) or after construction is complete (which we are led to generally assume is the send of the operating period); this lack of clarity signifies the potential for an approximate 80 year range in interpretation
- When the IPD indicates that "bentonite seals and concrete bulkheads are planned to be installed near access tunnel intersections and also near intersections with significant zones (as appropriate)" we speculate that the referral to "zones" is to fracture zones; this requires clarification, and definition as to what constitutes "significant" in terms of fracture zones
- The challenge of installing permanent markers to inform future generations of the presence of the sealed repository is significant and has been the subject of much debate over several decades; this single line reference to the need to communicate to future generations is wholly inadequate
- The final step described in the NWMO's section on closure and decommissioning is a bullet for "environmental monitoring, as needed"; this requires definition, including the methods of monitoring, the means of responding to monitoring results, and a clarification as to what or who will determine the application of "as needed".

4.3 Description of the Project Site, Location and Study Area(s)

A key irritant throughout the document and as expressed by the NWMO more generally is the reference to the NWMO's candidate site - the Revell site - as the "Wabigoon Lake Ojibway Nation and Township of Ignace area".[70] The site is, as NWMO describes, approximately 21 km southeast of Wabigoon Lake Ojibway Nation and 43 km northwest of the Township of Ignace along Highway 17. However, NWMO's re-naming of the site as the "Wabigoon Lake Ojibway Nation and Township of Ignace area" is inaccurate and unhelpful, and inconsistent with the NWMO's own delineation of the site and the study area.

The NWMO's candidate site is in an area that is mapped as "the Revell Lake area" on the Government of Ontario on-line mapping system[71] and it is an un-surveyed area immediate west of the surveyed township of Hodgson and south of the surveyed townships of Hyndman, Revell and Melgund and east of the unsurveyed Tabour Lake Area and Kawashegamuk Lake Area and north of the unsurveyed Bending Lake Area. The site drains southwest into Mennin Lake which is located approximately 2 km southwest of the Project site.[72] Mennin Lake flows north into the Mennin River, and then northwest into the Wabigoon River.[73]

The Nuclear Waste Management Organization referred to the site as the "Revell Batholith" in its Step 3 / Phase 1 reports and materials[74] and then simply named it as "Revell" in maps and as the "Revell Area" in documents during Step 3 / Phase 2 reports.[75]

NWMO's 2023 report "Confidence in Safety – Revell Site" [76] referred to the site – as the report title would suggest – as the Revell site and that report included a map situating the site within the larger region[77] and a figure denoting the actual site boundaries (and within those site boundaries the drill holes).[78]

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[70] IPD Executive Summary, page V
[71] See the "MLAS: Mining Lands Administration System", available online at https://www.ontario.ca/page/mining-lands-administration-system
[72] IPD Page 120
[73] IPD Page 121
[74] See, for example, the NWMO's "Preliminary Assessment for Siting a Deep Geological Repository for Canada's Used Nuclear Fuel, The Corporation of the Township of Ignace, Ontario, FINDINGS FROM PHASE ONE STUDIES", APM-REP-06144-0009, NOVEMBER 2013
[75] See, for example, the report by Tulloch Engineering Inc. NWMO Ignace APM Phase II - Environmental Studies Revell Area, 2016 to 2018, July 2018
[76] NWMO, Confidence in Safety – Revell Site – 2023 Update, NWMO-TR-2023-07, December 2023
[77] NWMO, Confidence in Safety – Revell Site – 2023 Update, NWMO-TR-2023-07, December 2023, Figure 1.2: General location of the Revell Site in northwestern Ontario, page 2
[78] NWMO, Confidence in Safety – Revell Site – 2023 Update, NWMO-TR-2023-07, December 2023, Figure 3.1: Surface bedrock map of the Revell area. The Revell Site is outlined, page 13

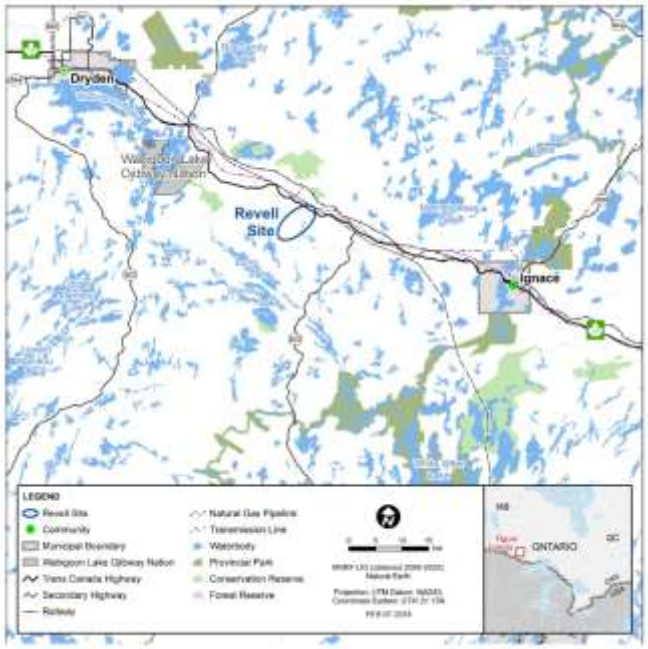


Figure 1.2: General location of the Revell Site in northwestern Ontario. Inset map shows main figure location in Ontario.

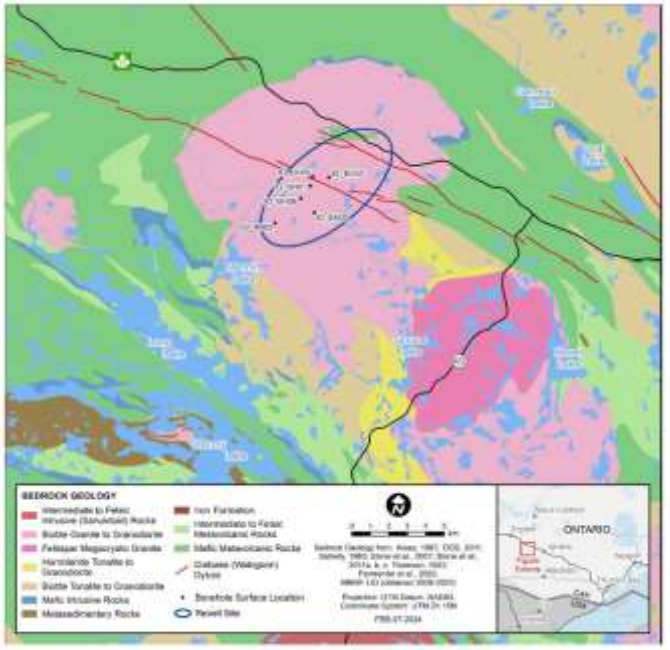
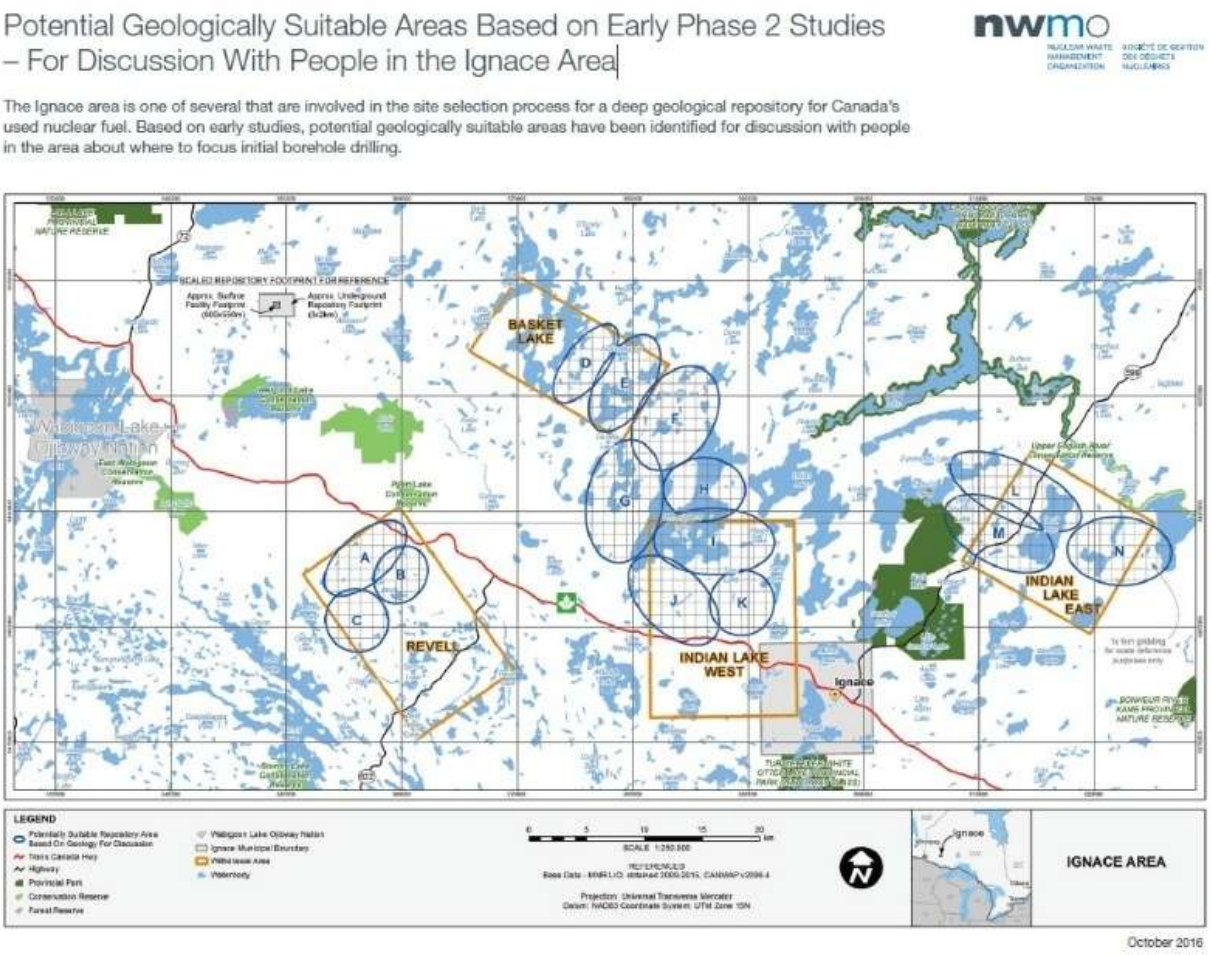


Figure 3.1: Surface bedrock map of the Revell area. The Revell Site is outlined with blue oval.

More recently, the NWMO has been referring to their candidate site as the "Wabigoon Lake Ojibway Nation and Township of Ignace area" which is both inconsistent with their earlier means of referencing the site and is incredibly imprecise, in that it refers to an area that is 64 km on an east-west axis and of unstated size on a north-south axis. Further, as NWMO's "Step 3 / Phase 2" map below indicates, there are several withdrawal areas between Ignace and Wabigoon Lake Ojibway Nation including in the Indian Lake West and the Basket Lake withdrawal areas which also fall with that large catchment area of being between Ignace and Wabigoon-Lake Ojibway Nation.

These areas are still withdrawn as per the 2013 request from the NWMO. The withdrawal order[79] states that "*the SURFACE RIGHTS and MINING RIGHTS of the area outlined in red on the attached sketch, situated in the Kenora Mining Division, containing 4,706.7 hectares more or less, are hereby WITHDRAWN from prospecting, staking, sale and lease. This withdrawal order is made to avoid the creation of new mineral tenure in the area that has been withdrawn while the Nuclear Waste Management Organization conducts preliminary field assessment activities to assist in the identification of a suitable site for a deep geological repository for Canada's used nuclear fuel.*"

[79] Ministry of Northern Development and Mines WITHDRAWAL ORDER NO.W-K-98/13, Pursuant to section 35 of the Mining Act, R.S.O. 1990, c. M.14 dated Wednesday, November 20, 2013



In effect, the NWMO referring to their candidate site as the "Wabigoon Lake Ojibway Nation and Township of Ignace area" indicates that their proposed repository and ancillary activities could be located in any of the withdrawn areas between Ignace and Wabigoon Lake Ojibway Nation, but not necessarily within the Revell area. We have heard a concern to this effect raised by residents in the region and responded to many questions from the broader public who are newer to the discussion about the actual location of the site, following the NWMO's very general re-naming of the site as the "Wabigoon Lake Ojibway Nation and Township of Ignace area".

While we do not expect the NWMO to actually site the repository outside of the Revell area and we recognize that within the IPD the NWMO has described the location[80] and provided a map[81] the NWMO's persistent referral to the area in the IPD as the "Wabigoon Lake Ojibway Nation

[80] Section C.13, beginning page 95
[81] IPD figure 13.1, page 97

and Township of Ignace area " and failure to identify it by an actual site name is indicative of the larger issue or to clearly map the Project site in a figure in the IPD is problematic.

More specific to the Initial Project Description provided to the Agency for public comment, we note that in Section C. *LOCATION INFORMATION AND CONTEXT* the NWMO makes a bracketed reference to the
"Revell withdrawal area" (page 95) but no references to the Revell site or even the Revell area.

Section 14.2 *Geology and Geological Hazards* includes the single reference to the project location as the Revell site (page 106) in the IPD, aside from a citing of the 2023 *Confidence in Safety* report in Section 14.3.1 *Currently Available Baseline Data* and in report titles included in the references. There are a half-dozen references to the Revell Batholith in that same section.

While Figure 1.1 Project Location and Figure 1.2 Regional Communities in Section A.1 General Project Information situate the project very generally in maps that are 1:500,000 and 1:850,000 scale respectively, neither outline the site boundaries or the boundaries of the project study area. Similarly, while Figure 9.1 *Regional Communities* and Figure 9.2 *Currently Proposed Conceptual Site Plan* present a very generalized depiction of the "currently proposed conceptual site plan" neither identify the project site boundaries or the project study area.

Section 14 makes numerous references to "the study area" or to "study areas" or to "select study areas", in some instances referring to findings being summarized and in other instances in reference to future work. There is no description of the location or delineation of the site area or boundaries of the study area(s) and no figures or maps depict the site boundaries or the study area(s). Many of these references are in subsections that cite various CanNorth reports. Previously, a series of baseline studies were available through the NWMO web site, but they appear to be no longer available (this is part of a larger problem with information not being made available by the NWMO; reports are removed from their web site, reports are difficult to find on their web site, and the search function in the "reports" section of the NWMO web site is faulty and frequently does not yield results for reports using the search function that are still on the web site; for example, a search function using key words or a report's name might fail to produce a report but the same report can be founded by searching by the year and scanning all the reports from that year).

None of the four CanNorth reports listed in the references for the IPD were available on the NWMO web site. Two baseline study reports commissioned by the NWMO during the same general time frame and prepared by CanNorth or their partner Zoetica variously described the site area and the study area(s).

CanNorth's Environmental Media Baseline Program – Year 2 Baseline Report prepared for the NWMO in 2025 states the following:

> *The EMBP includes monitoring the conceptual boundary of the potential facility (called the Site Study Area [SSA]) that would be located somewhere within the*

> *Area of Interest (AOI), in environments surrounding the facility (called the Local Study Area [LSA]), and in some cases, in a larger area (called the Regional Study Area [RSA]). The proposed LSAX and RSAx, where 'x' is specific for each of the environmental components, differ for the components and are discussed within respective sections of this report.*[82]

There are no maps or figures depicting the location or boundaries of the project site area, the site study area, the "Area of Interest", the Local Study area, or the Regional Study area and no clear description of the location or locators found in the text of the report.

[82] CanNorth, EMBP – Year 2 Baseline Report for WLON-Ignace, prepared for the Nuclear Waste Management Organization, Page 6, November 2024

4.4 Safety and Environmental Protection

4.4.1 Potential Effects of the Project

As with other sections of the IPD, the section tiled "Potential Effects of the Project" is poorly organized and lacks discussion of adequate description in several areas. As the Agency considers public comments for the purpose of developing the Statement of Issues and the draft Integrated Tailored Impact Statement Guidelines, we trust that they will consider the entirety of each submission – including Northwatch's – rather thank looking only at the comments corresponding with the NWMO's IPD chapter on potential effects.

These comments follow the order of the NWMO's presentation in IPD section E[83]; additional comments on potential effects of the project are found in other sections of Northwatch's submission.

- In introducing the section, NWMO states that the section aims to provide a preliminary assessment of the changes to the environment; "changes" is different from "effects" of the project, and releases (to air or water) and removals (of habitat, waterbodies) may constitute a "change" or may not, depending on the measure; the description should address all three: potential or expected changes; potential, expected or measured effects, and releases to air and water from each activity to be carried out as part of the NWMO's operation
- It is disingenuous of the NWMO to message to the pubic and Indigenous people that "there will be opportunities to review and comment through the CNSC's public hearings" without also messaging that 1) those public hearings do not include an opportunity to question or test the evidence put before the Commission through written or oral questions, 2) are limited to ten minutes of oral presentation per intervenor regardless of the volume of issues to be addressed, and 3) that some "public hearings" are hearings-in-writing only, with no opportunity to observe the proceedings, present to the Commission, or even receive a transcript.
- While WLON's Hosting Agreement has not been made public, it has been made public that the WLON's "willingness" rests on the outcome of their own sovereign Regulatory Assessment and Approvals Process (RAAP); this important distinction is omitted by NWMO's description
- While it is reasonable to characterize the Hosting Agreement signed by the Township of Ignace as providing a "framework for participation in the regulatory process" it is also a fact that the Hosting Agreement also places constraints on the Township's participation

[83] IPD pages 192-250

- The IPD states that "Prior to site preparation, the NWMO will collaborate with WLON and the Township of Ignace to confirm the suitability of proposed mitigation measures and develop follow-up and monitoring programs"; we understand the hosting agreement with the Township of Ignace was important to the NWMO for promotional purposes, but the continued emphasis on the Township of Ignace as if they have authority over the project site or project area is wholly inappropriate; NWMO maintains that the project is being guided by "Canadians" so "Canadians" should continue to provide that guidance, and those residing closer to the site and downstream of the site should be directly engages
- Similarly, while we recognize that Wabigoon Lake Ojibway Nation is the most proximate First Nation to the site, there are several other Nations who are also land users and Treaty 3 people more generally are rights holders; we respect WLON as rights holders, but remind the Agency and the NWMO that these rights are not exclusively held, and Indigenous peoples more generally should not be disrespected on the basis of the NWMO having formed an agreement with WLON
- We appreciate the NWMO's acknowledgement that the used nuclear fuel requires permanent containment to protect future generations; our assessment is that the NWMO is not consistently guided by that reality
- Throughout the document the NWMO makes numerous unsupported claims, such as their statement(s) that their Project "provides a safe and permanent solution"; this has not been established and in fact their project is still under development and largely conceptual (based on available information), and the concept of deep geological repositories more generally is untested, lacks any operating experience, and continues to be the subject of many technical and scientific uncertainties; as a general observation, these promotional statements being littered throughout the document is unhelpful, distracting, and signals a lack of project maturity
- "Supporting the continued role of nuclear energy" is outside the NWMO's mandate as set out in the Nuclear Fuel Waste Act (2002); again, these promotional statements being littered throughout the document is unhelpful, distracting, and signals a lack of project maturity
- The identification of potential effects, pathways of change and risk screening (IPD section 19.2) can be only speculative, at best, in the absence of a mature project design and description
- The following comments are with respect to *Table 19.1: Valued Components and Associated Measurement Indicators and Assessment Endpoints:*
    - Local residents and land users should be included in consideration of "Noise, Vibration and Light"
    - Fish health should be a measurement indicator for "Fish and Fish Habitat"

    - It is unclear how "changes in health conditions" would be measured for ethe VC "non-Indigenous Health Conditions", what the scope of assessment would be, and how participants in the health studies would be identified
    - Measurement indicators for the VC "non-Indigenous Health Conditions" should include releases of deleterious emissions, including radionuclides; assessment endpoints should include increases in release levels of deleterious substances and radio-contaminants at the project site, local and regional levels
    - Measurements and assessment endpoints for non-Indigenous Economic Conditions must include effects of the project and the NWMO as an employee on other local and regional employees and businesses; the NWMO is not contained financial with continued generous access to funds collected by Ontario Power Generation from the ratepayers of Ontario (and to a much lesser degree from the ratepayers of Quebec and New Brunswick) and other sectors might not be able to compete in what is likely to be an unfair wage advantage held by the NWMO; this applies to the traditional resource industries (mining and forestry) and to the service sector including health, tourism, and retail, among others
    - The qualifier of "traditional purposes" included in the VC of "current use of lands and resources.... by Indigenous peoples" is problematic; treaty and Indigenous rights are not frozen in time and are not limited by a non-Indigenous perception or definition of what is a "traditional" land use
- The Pathways of Change Screening (Section 19.2.2.2) is problematic on several counts, including:
    - The statement that screening is focuses on certain residual effecs or valued components "allowing mitigation to be directed where it is most effective" strongly suggests that not all mitigation measure will be applied, but that there will be a ranking with some applied and some not; this requires clarification, and if that is in fact the intent it requires correction
    - Similarly, the statement "Feasible design and mitigation practices are then implemented to avoid or minimize effects" is highly subjective; who makes the determination that a mitigation is "feasible"
- The statement that "Environmental design features and mitigation measures are developed iteratively by technical experts and will be confirmed acceptable in collaboration with WLON and the Township of Ignace" is problematic, for reasons outlined above, i.e. the continued emphasis on the Township of Ignace as if they have authority over the project site or project area is wholly inappropriate; NWMO maintains that the project is being guided by "Canadians" so "Canadians" should continue to provide that guidance, and those residing closer to the site and downstream of the site

should be directly engages; similarly, while we recognize that Wabigoon Lake Ojibway Nation is the most proximate First Nation to the site, there are several other Nations who are also land users and Treaty 3 people more generally are rights holders; we respect WLON as rights holders, but remind the Agency and the NWMO that these rights are not exclusively held, and Indigenous peoples more generally should not be disrespected on the basis of the NWMO having formed an agreement with WLON

- Section 19.2.2.2.3 (Step 3: Pathways of Change Screening) raises questions of how "measurable change" is measured; in the absence of this clarification the following bullet points are not meaningful:
    - *No—No measurable change occurs in the valued or intermediate component after applying design features or mitigation.*
    - *Yes—A measurable change may occur even after applying mitigation*

- The "degree ratings" in *Table 19.2: Definitions for Different Degree and Likelihood Ratings* are inappropriate when applied to radioactive releases, given that a) these releases have a stochastic effect, and b) there is no level of exposure or dose that does not carry with it a corresponding risk[84]
- The IPD states that "The Project will be constructed using conventional mining techniques; therefore, mitigation measures suitable for comparable mining projects in the regional area and previously approved by the IAAC (including Hardrock, Goliath, and Hammond Reef Gold Projects) (CEAA 2018a,b, 2019) are appropriate mitigation for effects of carrying out the Project"; this is problematic for two key reasons: 1) as described elsewhere in this submission, there is a concern in the construction of geological repositories for radioactive waste that is not a factor or is not as great a factor in mining projects, that been the development of Excavation Damage Zones which can create or contribute to pathways for the migration of radionuclides from the repository to groundwater or surface water; 2) related to that, the objectives of a conventional mine and a deep geological repository are fundamentally different in that in a mine the objective is take ore <u>out</u>, while the objective of a deep geological repository is to keep radionuclides <u>in</u>
- The document states that "*Effects, mitigation measures, and monitoring requirements for these phases are comparable to those assessed for the Ontario Power Generation DGR Project and AECL's Nuclear Fuel Waste Management and Disposal Concept. <u>In both cases, federal EAs concluded that, with mitigation, significant adverse effects were not expected, and deep geological disposal was identified as the preferred method for</u>*

[84] See, for example, National Academy of Science, Beir VII: Health Risks from Exposure to Low Levels of Ionizing Radiation as found at https://nap.nationalacademies.org/resource/11340/beir_vii_final.pdf

safely isolating radioactive waste"; this statement is a mis-representation of both outcomes. In the case of OPG's DGR project the CNSC and OPG (with NWMO as their consultants) were successful in persuading the Joint Review Panel that many of the fundamental safety and design issues could be deferred to later licencing stages, which is a precedent we are very concerned might apply to this review; in the case of the AECL concept review, the panel did not conclude that the AECL concept was "safe", but that it was "feasible" as a concept, but As stated by the Panel in their final report:

> *Key Panel Conclusions:*
> *Broad public support is necessary in Canada to ensure the acceptability of a concept for managing nuclear fuel wastes.*
> *Safety is a key part, but only one part, of acceptability. Safety must be viewed from two complementary perspectives: technical and social.*
> *From a technical perspective, safety of the AECL concept has been on balance adequately demonstrated for a conceptual stage of development, but from a social perspective, it has not.*
> *As it stands, the AECL concept for deep geological disposal has not been demonstrated to have broad public support. The concept in its current form does not have the required level of acceptability to be adopted as Canada's approach for managing nuclear fuel wastes*[85]

- The presentation format of *Table 19.4: Pathways of Change Screening for Intermediate and Valued Components* was problematic; our comments are limited as s result
- The information on air quality in 19.2.3.1.1 Pathways of Change Screening is too limited and does not support a review of this issue
- We note that, in addition to the lack of detail and content in this section overall, air dispersion modelling has not yet been completed (which is not surprising, given that the project is still at a conceptual stage); this is another indicator that the NWMO has begun the impact assessment process prematurely
- The document states that "Mitigation measures and monitoring requirements will be shared with WLON, the Township of Ignace, and regulatory agencies"; as outlined above this statement is problematic due to its the continued emphasis on the Township of Ignace as if they have authority over the project site or project area is wholly inappropriate; NWMO maintains that the project is being guided by "Canadians" so "Canadians" should continue to provide that guidance, and those residing closer to the

[85] Panel Report under the Environmental Assessment Review Panel Guidelines Order review of Atomic Energy of Canada Limited's Geological Disposal Concept, March 1998, as found at https://iaac-aeic.gc.ca/archives/evaluations/431C8844-1/default_lang=En_n=0B83BD43-1_offset=_toc=hide.html

site and downstream of the site should be directly engages; similarly, while we recognize that Wabigoon Lake Ojibway Nation is the most proximate First Nation to the site, there are several other Nations who are also land users and Treaty 3 people more generally are rights holders; we respect WLON as rights holders, but remind the Agency and the NWMO that these rights are not exclusively held, and Indigenous peoples more generally should not be disrespected on the basis of the NWMO having formed an agreement with WLON

- The IPD states that "Emissions and dust from similar projects typically settle within 500 m to 1 km of the source due to particle size, low release heights, and limited dispersion"; note that there are no "similar projects" - there is not a deep geological repository for nuclear fuel waste operating anywhere in the world; we are not going to speculate that perhaps meant a mining project or some other construction project of similar size, because the statement was about similar projects, not about other sector projects from which they may wish to draw a comparison of convenience; alternatively, this might simply be another instance of the NWMO wishing to cloak the fact that their project is unprecedented with no operational experience on which to draw
- The discussion of climate change in section 19.2.3.2 is problematic for three key reasons: 1) it omits the large green house gas contributions that will result from the long-distance transportation of the fuel waste from the reactor stations to the repository site, 2) the NWMO did not provide sufficient information to win confidence in their Section 22 estimates, and 3) it appears that there estimates excluded the off-site contributions to greenhouse gas emissions, including but not limited to the mining and transporting of project materials, such as bentonite, steel and copper
- We note that the conceptual groundwater model is planned but not completed; this is another indication that the impact assessment process was initiated prematurely
- Significantly, the NWMO acknowledges that "*Although environmental design features, mitigation and protection measures are anticipated to mitigate changes in hydrology and surface water quality below regulatory guidelines and standards, the potential still exists for the Project to change hydrology and surface water quality compared to baseline conditions, which would result in a residual adverse effect"* and goes on to state, as if a remedy that *"As residual effects on the hydrology and surface water quality intermediate components are anticipated, a preliminary risk screening was completed to provide the anticipated level of risk inherent to predicted residual effects on hydrology and surface water quality*"; it then concedes two paragraphs down, that the hydrology and water quality modelling (necessary to the preliminary risk assessment) has yet to be completed; this is another indication that the impact assessment process was initiated prematurely

- The hydrology section does not explicitly discuss the dewatering (and pumping to surface) that will be required in the repository, or how it relates to the reference to "water supply demands" and "groundwater drawdown"; these are important concerns, and should be set out in detail
- The IPD states that "the degree of residual effects on hydrology are best characterized as low, with a moderate likelihood of occurrence"; this seems incongruous with the conceptual stage of design, the lack of hydrology and water quality modelling, and the incomplete nature of the preliminary risk screening of residual effects; these very generalized and unsupported statements are counterproductive
- The section on Surface Water Quality is overly generic, and lacks actual information about the site and the project design and the interface between the site and the project design
- The IPD claims a "high level of confidence" in the effectiveness of mitigation and protective measures but a) does not describe those measures and b) acknowledges the absence of water quality monitoring
- In Section *19.2.3.7.2 Preliminary Risk Screening of Residual Effects* the IPD references "in-water works" but does not define or describe these activities
- In the same section, the IPD refences "public access management" to "mitigate potential pressures from increased human pressure"; this statement needs clarification: is the NWMO intending or proposing to limit the access of local residents to the area that is currently used for hunting, fishing, trapping, bait-fishing, camping, canoe, foraging, and other activities? Or is the NWMO proposing to limit access for the hundreds of imported workers who will be living on-site? This is an issue of important social consequence, and the NWMO needs to be clear and explicit about their intentions to "limit access"; while it may not be known to Agency staff in Ottawa or NWMO employees in Toronto, the limiting of public access to Crown Land has been a hot-button issue in northern Ontario for decades; in fairness, if the NWMO intends to limit public access to crown lands that should have been made clearly know much earlier in the siting process.
- The claims repeated from Section 14.3.1 that there has been extensive geochemical testing and the excavated rock has been indicated to be non-acid generating is insufficient, as is the presentation in Section 14.3.1, which acknowledges that the rock formation at the site is sulphur-bearing, but then surmises that it is not likely to impact the copper in the UFC design but is silent on the role that sulphur-bearing rock will play in the potential for acid-generation and /or metal leaching from the rock
- In section 19.2.3.9.1 the IPD states that "*Project activities during site all Project phases, including site clearing, blasting, construction of Project components, in-water works, altered site drainage, runoff, water withdrawal and discharge of treated effluent have the*

potential to directly and indirectly effect migratory and SAR birds and their habitats. Without the implementation of environmental design features, mitigation and environmental protection measures, the following pathways of change from these Project activities (Table 19.4) have the potential to result in in a moderate to high degree of adverse effects on the migratory and SAR bird valued component" but does not describe the environmental design features and mitigation measures that are to prevent these adverse effects

- Protection of human health would be comprehensively addressed through the NWMO's licensing
- In section *19.2.3.11.1 Pathways of Change Screening the NWMO argues that "Protection of human health would be comprehensively addressed through the NWMO's licensing requirements under the NSCA*"; this attempted diversion is unacceptable; the Agency must ensure that human health is thoroughly addressed through the Impact Assessment process, rather than deferred to a ten-minutes-each licencing hearing several years into the future; human health is a fundamental concern and is a matter for thorough examination in the IAA review
- The discussion of "Social Determinants of Health" is largely focussed on income and ignores key issues such as social division, nuclear anxiety, stigma effect of having a nuclear project imposed on our area. Effects on property values is also omitted, as is the issue raised earlier about the viability of smaller businesses who must compete in the marketplace for income to pay employees and the disadvantage they will experience when competing with the seemingly unlimited resources of the NWMO for employees; the ripple effect of businesses not being viable in the changed job market will extend to availability of a wider range of services and retain options, the loss of which can adversely affect the quality of life for residents in the region
- As in several other sections, in section *19.2.3.13.1 Preliminary Risk Screening of Residual Effects* the IPD states that "*the Project will generate conventional and radioactive waste during operations. Conventional waste will be disposed of at Licenced off-site facilities in coordination with local authorities, while low- and intermediate-level radioactive waste will be stored on site and later co-emplaced in the DGR or transported to another Licenced facility. Both options will meet stringent regulatory requirements, and social effects are expected to be negligible*"; this section raises several issues including:
    - The IPD does not provide a fulsome discussion of the liquid and solid low and intermediate level radioactive wastes that it acknowledges in several sections will be generated; the IPD should provide a detailed inventory with characterization and volumes of the various waste types and the storage and

management systems that will be in place for these wastes; the information provided is inadequate (throughout the IPD, not just in this section)
    - The use of local landfills for conventional waste could have the effect of greatly shortening the landfill's service life, depending on the volume of conventional waste the NWMO will generate (given the size of operation and workforce we expect that the project will be a large-volume generator of conventional waste); the NWMO must provide information about the estimated volume of conventional waste to be generated at various project stages, how the NWMO will implement waste diversion practices throughout their operations and facilities (including the accommodation camp), and identify which local landfills they will utilize and how the municipality will be compensated, including and particularly for the shortened service life of the landfill
- While recognizing that "these are preliminary conclusions, as the completion of the quantitative modelling to describe anticipated effects has not yet been completed" the NWMO goes on to say that "nevertheless, there is a high level of confidence in the proposed mitigation and protection measures, which are grounded in proven practices and established regulatory standards"; this provokes several observations:
    - The confidence is only their own; the NWMO has not gained public confidence in their project or in their ability – or willingness - to anticipate and / or mitigate its negative consequences
    - There are no "proven practices" for this unprecedented project; as already indicated, this is a first-of-a-kind project, with no other operating deep geological repositories anywhere in the world; those that are in the regulatory process – Sweden, Finland, France – are sufficiently different in design and/or project setting that only the most general claims could be made about "operating experience" that is applicable to the NWMO's project, and that "operating experience" will be decades – centuries, actually – in the making
    - The regulatory standards with respect to the Deep Geological Repositories are, in Canada, a series of Regulatory Documents which do not have the force of law and are relatively recent and have not yet been applied; the Nuclear Safety Control Act has been in place for a few decades, but is non-prescriptive and does not provide regulatory guidance specific to deep geological repositories

4.5 Site Selection

The NWMO summarizes their site selection process thus:

In November 2024, following a 14-year site selection process, extensive public engagement, and a comprehensive technical assessment demonstrating confidence in safety, the decision was made to locate the Project in the Wabigoon Lake Ojibway Nation and Ignace siting area. This milestone marked the completion of more than a decade of rigorous scientific study and a community-driven, consent-based siting process, advancing the Project into the regulatory decision-making phase.

Northwatch has been very engaged in the siting process, including:

- Participating in NWMO "dialogues" in 2008 and 2009 with respect to the development of the siting process
- Visiting and engaging with the 19 communities in Ontario that the NWMO investigated between 2010 and 2025
- Providing workshops and public engagement and education events in the 13 communities in northern Ontario, including interactive workshops, a speakers series, a film series and outdoor events, as well as participating in sessions hosted by the Municipality in several communities including Igance and Dryden
- Visiting several First Nation communities and sharing perspectives and information, including several in the area of the Revell site, including Wabigoon Lake Ojibway Nation
- Presenting to most Community Liaison Committees or attending CLC meetings
- Hosting an annual webinar the first week of February each year since 2012 providing an overview and update on the NWMO's site search and DGR design and development
- Carrying out site visits of each of the withdrawn areas associated with the communities of Blind River / Elliot Lake, White River, Hornepayne, Manitouwadge and Ignace during the period when they were "general potentially suitable areas" and revisiting the Revel site after it became a "candidate site" including as part of a site tour hosted by the NWMO

Based on this experience and our observations, we would characterize the siting process differently than the NWMO has done, including but not limited to the manner in which they describe their "willingness process" or the outcomes of that process.

However, for the purpose of this review on the NWMO's Initial Project Description we do not intend to revisit that period or provide a detailed analysis. Instead, we will provide brief comment on select sections of the IPD that relate to the siting process, and identify issue areas which must be included in the Guidelines to insure an examination of this topic in the impact assessment phase of the review.

Our comments on the IPD or in response to content found in the IPD include the following:

- It must be noted that the survey question upon which the Township of Ignace bases their claim of "willingness" asked those responding via the online poll if they were willing to continue in the NWMO siting process; it did not ask if they supported the deep geological repository being constructed in the region
- We noted again that the "willingness" of Wabigoon Lake Ojbiway Nation is contingent on the outcome of their Regulatory Assessment and Approvals Process; the community vote in November 2024 was with respect to their willingness to have the NWMO move to site characterization activities; WLON was explicit at the time the results of the community vote did not constitute support for the project
- In future documents the NWMO should provide evidence in support of their repeated claim that the siting process was "community-driven"; what we observed throughout the 13 communities investigated in northern Ontario was very much a cookie-cutter approach, with the NWMO applying the same or very similar formula across the suite of communities

As noted in earlier sections of this submission, we strongly disagree with the NWMO's determination to seek input and feedback primarily if note exclusively from the Township of Ignace and Wabigoon Lake Ojibway Nation during the current impact assessment process, including future phases.

As discussed in our comments on the project site, the NWMO has mischaracterized who are the "host communities" by entering into a series of financially incentivized agreements with the Township of Ignace over the last decade plus, at the exclusion of the more nearby communities, the transportation route communities and the downstream communities.

Finally, we note that even after a decade and a half of operations in the area, the NWMO still fails to recognize the communities in the Township of Melgund as the nearest settlements. In several instances when summarizing community profiles, the NWMO included the Local Service Board for Wabigoon (the community, not the First Nation) while omitting the Township of Melgund (which also has a Local Service Board).

4.6 Significant Gaps and Deficiencies

In addition to the gaps and deficiencies identified in previous sections of our review, we note that the following topics are either presented in insufficient detail, not presented as discussions in their own right, or are fully absent; those topics include:

- Long-Term safety
- Emergency response and evacuation plans
- Accidents
- Malevolent acts / Security

These areas should be added to the revised Initial Project Description or the Detailed Project Description and included in the list of issues raised in the course of the review (even though we are raising them on account of their absence, rather to comment on their presentation in the IPD).

4.7 Organization of the document

The Initial Project Description as a package creates the impression that the NWMO is an organization without resources and in a hurry.

The document appears to not have had the benefit of a copy editor and the overall organization is frustrating, with some sections repeated, and content on the same topic provided in different locations in the document. An index may have assisted with this, but re-organization would have been the better choice (with or without an index).

The document lacked a glossary; this is particularly problematic both because there were many terms used which the public would not be familiar with, and also because of the NWMO's tendance to adopt certain terms and load them with their own particular meaning. A glossary should be required in the revised Initial Project Description or the Detailed Project Description.

Some sections of the document were difficult to review in a regular office or home setting, such as Table 19.4, which in the absence of a very large screen or a large-format printer was difficult to view given the number of columns, size of font and volume of text.

Future documents produced by the NWMO for the Impact Assessment Process should go through a readability filter, both for design and for layout.

5. IAAC Process and Process

We are pleased to participate in the Impact Assessment Process and are advocates for environmental assessment / impact assessment processes and the practice of "good EA".

While we support the general principle of assessment starting early in the process, in the case of the NWMO's project we are already fifteen years into "the process" and our concern at this point is not that the process is not early enough but that it is in effect "too early" in that the NWMO is presenting an immature project and undeveloped concept, while attempting to persuade both the decision-makers – at this point the Agency – and the public that their project is ready for assessment. We are not persuaded it is and are concerned that the NWMO's intention is to limit the effectiveness of the impact assessment process and defer key safety and design issues to much later licencing stages (construction, or even later the operating license stage).

Impact assessment must consider the whole project, and must support the public, the review panel, and the government review team in considering the whole project and the various project phases and activities and potential effects of those activities. A superficial review – made superficial by an incomplete project design and description – carried out under rigid timelines will not serve the public, the environment or the Agency well.

We wish to note challenges encountered in this first step in the planning phase of this review:

- While we appreciate that the Agency is operating within time constraints, the 30 day comment period is too short, particularly for a novel project of this size, complexity and long-lived consequences
- The registry is not user friendly: the sort function often fails to actually sort records by date and there appears to be no means to get it to sort by record number; it is not possible to capture a listing of the records or comments posted on the registry, and each time a comment is opened the user is returned to the top of the listing of documents and required to scroll down to the find the next document to be opened
- Announcing the participant funding on the same day as the comment period begins and having the application deadline the same day as the comment period ends is problematic; we expect that in most if not all cases the Agency can anticipate with a fair amount of accuracy with the Initial Project Description is to be posted, and could announce the participant funding in advance of the planning phase commencing; this was the arrangement under CEAA, and we have heard no explanation as to why the arrangement could not be similar under the IAA
- The online portal for posting comments seems to encourage individuals to identify a group that they are associated with; this results in individuals identifying as an organization of which they are a member but not a representative, which in turn results in a misperception of the input being provided by the groups who are being named, including by members or other concerned individuals who identify with the organization but are not authorized to represent

6. Conclusions and Next Steps

In closing, we make the following requests and recommendations:

1. Designate the NWMO's Deep Geological Repository Project for a full impact assessment and public hearing
2. Require that long-distance transportation of nuclear fuel waste from the reactor stations to the proposed repository site be included in the impact assessment
3. Direct the NWMO to produce a revised Initial Project Description and invite public comment on that revised version; in the alternative, require a Detailed Project Description after producing the summary of issues raised during this comment period
4. Incorporate the issues raised by Northwatch in this submission into the Issues List to be issued to the NWMO following this comment period.

Appendix 1

Excerpts from NWMO Project Descriptions and Related Documents Referencing or Describing Transportation as Part of NWMO's DGR Project

Source (document, presentation)	Date	Sample Excerpt
Nuclear Fuel Waste Act	Jun-02	Nuclear Fuel Waste Act (2002) Definitions, 2 The following definitions apply in this Act: management, in relation to nuclear fuel waste, means long-term management by means of storage or disposal, including handling, treatment, conditioning or **transport for the purpose of storage or disposal**.
ADAPTIVE PHASED MANAGEMENT, TECHNICAL DESCRIPTION Nuclear Waste Management Organization	Oct-05	This "technical description" sets out three phases for the development and implementation of a Deep Geological Repository, referring to it as an "adaptive phased management approach, and describe Phase 1 of that approach as including the development and certification of transportation containers and used fuel handling capabilities, and the environmental assessment process. It also notes that "transportation systems for used fuel would need further development, testing and demonstration (Cogema 2003). And the mode of transportation: road, rail or water, may need further optimization to meet the needs of potential affected communities for the central facility."
Choosing a Way Forward The Future Management of Canada's Used Nuclear Fuel Final Study, NWMO, 2005	Nov-05	There may be a need for transportation containers and facilities to produce them; processing facilities to load the fuel into transportation containers; production facilities for storage containers; and processing facilities to transfer the fuel from transportation to storage containers (page 25) Ethically, engagement should ensure that those who most directly could be exposed to harm or risk of harm are involved. We must understand concerns of regions and communities that are affected directly and indirectly. These communities will become active players and problem solvers. Communities must be informed and equipped with resources to participate in discussions and decision-making. Their participation must be based on an understanding of potential risks and the means to manage them, including those from transportation. Communities in the vicinity of any future facility must have opportunities for genuine involvement. (page 43)

Source (document, presentation)	Date	Sample Excerpt
Ensuring Safe Transportation of Used Nuclear Fuel, Background 2010	May-10	Transportation of used nuclear fuel to a centralized facility is a necessary component of implementing Adaptive Phased Management (APM) for the long-term management of Canada's used nuclear fuel. The Nuclear Waste Management Organization (NWMO) recognizes that people have questions and concerns about the transport of used nuclear fuel. However, Canadian and international experience demonstrates that used nuclear fuel can be transported safely.
Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise	Oct-12	APM is a multi-generational project that will be implemented through a number of phases. These include: 1. Site selection and regulatory approvals; 2. Construction; 3. Operation; 4. Extended monitoring; 5. Decommissioning and closure; and 6. Postclosure monitoring. The site selection and regulatory approvals process will take about 15 years to complete, followed by a 10-year period to construct the facility. Used fuel transportation, handling and placement operations in the repository will occur over about 40 years or more, after which the repository will be monitored for an extended period of time prior to decommissioning, closure and postclosure monitoring.
Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise	Oct-12	What Is Canada's Plan for Long-Term Used Fuel Management? 3.1 Components of Canada's Plan 3.2 Phased Implementation 3.3 Facilities 3.4 Transportation of Used Fuel (TofC)
Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise	Oct-12	Implementing APM involves a $16- to $24-billion national infrastructure project funded by the waste owners through segregated funds required by the Nuclear Fuel Waste Act. Key facilities include the development of: »» A deep geological repository; »» A used fuel container manufacturing plant; »» A used fuel packaging plant; »» A sealing materials production plant; »» A national centre of expertise; »» A used fuel transportation cask manufacturing plant; and»» A used fuel transportation system, including development and maintenance of vehicles and ancillary facilities. (page 7)

Source (document, presentation)	Date	Sample Excerpt
Description of Canada's Repository for Used Nuclear Fuel and Centre of Expertise	Oct-12	Used nuclear fuel is currently safely stored in facilities licensed by the Canadian Nuclear Safety Commission (CNSC) at sites where it is produced. Placing all Canada's used nuclear fuel in a single central location will require transportation from these interim storage facilities to the deep geological repository. A transportation system that ensures the safe and secure transport of used nuclear fuel will need to be developed. (page 8)
Assessing Radiological Dose to Members of the Public and Workers during UFTP Transportation, NWMO-TR-2015-17	Sep-15	To protect workers and the public, the transportation regulations set maximum radiation levels for transportation packages and the conveyances in which the packages are transported. Additionally, a distinction for shipments requiring exclusive use is made. Exclusive use (IAEA, 2012) is the term used to define shipments by a sole consignor with control over the shipment and all initial, intermediate and final loading and unloading operations. According to regulatory requirements, the UFTP is required to be shipped under exclusive use. (page 5)
Technical Program for Long-Term Management of Canada's Used Nuclear Fuel – Annual Report 2018, NWMO-TR-2019-01	Dec-19	The main activities in the Repository Engineering program during 2018 were: used fuel transportation; the proof testing program, engineered barrier science, and design. Summaries of the research and development activities are provided in the following sections. ... As part of its responsibility for long-term management of this used fuel, the NWMO will be responsible for the transport of this fuel to its selected repository site. (page 5)
NWMO Presentation to the Canadian Nuclear Safety Commission, Commission Meeting, April 2021	Apr-21	Presentation slides: Transportation listed as one of three key factors for selecting a preferred site (slide 8), slide 9 on transportation safety, slide 10 on transportation dialogue

Source (document, presentation)	Date	Sample Excerpt
NWMO Presentation to the Canadian Nuclear Safety Commission, Commission Meeting, April 2021	Apr-21	The process for selecting a site involves studies and dialog to build a willing community and confidence that a strong partnership can be developed with the interested municipality, First Nation and Metis communities in the area and surrounding communities. Confidence, a deep geological repository can be developed, a strong safety case at that location. And confidence, a safe, secure and socially accepted transportation plan can be developed. (14 minutes) We are pursuing site characterization, design safety and environmental assessments to develop a safety case for the repository, and we are undertaking engagement activities on the transport of used nuclear fuel, including the development of a transportation planning framework in collaboration with Canadians (36 minutes)

Source (document, presentation)	Date	Sample Excerpt
NWMO Presentation to the Canadian Nuclear Safety Commission, Commission Meeting, April 2021	Apr-21	Rumina Velshi, President CNSC: .... which is kind of a nice segue to the question to the impact assessment agency. And I believe we've got representatives here from there. This will likely be the first nuclear project undergoing an impact assessment, from what you know of the NWMO's and the CNSC activities in readiness for this, any comments, any concerns that you have, and I'm particularly interested Around the transportation of this project, and does that get vetted into the impact assessment or how does it ... Sean Carriere, Acting Director for the Ontario Regional Office, Impact Assessment Agency: Good afternoon. Uh, Sean Carriere. I am the acting director for the Ontario Regional Office of the Impact Assessment Agency. So at this stage, we are still - so, we are working with the NWMO through the site selection process. We are in the pre-planning phase so the proponent has not submitted their initial project description as required. So we are participating in these pre-planning activities, recognising their importance and their value in setting up an effective assessment process. Once it's formally engaged, as we are looking at the transportation elements those will be - we currently do not have any information on the transportation but we will be looking to the proponent to include that kind of information in the initial project description.

Source (document, presentation)	Date	Sample Excerpt
Deep Geological Repository Transportation System Conceptual Design Report Crystalline / Sedimentary Rock, APM-REP-00440-0209-R001	Sep-21	Canada's plan for the long-term management of used nuclear fuel (used fuel) is known as Adaptive Phased Management (APM). The plan consists of containing and isolating Canada's used fuel in a Deep Geological Repository (DGR) within a suitable rock formation. Canada's used fuel is currently safely managed in facilities licensed for interim storage. These interim storage facilities are located in Ontario, Québec, New Brunswick, and Manitoba. Under the APM DGR plan, used fuel will be transported from these interim storage facilities to the DGR. The NWMO maintains a reference design and lifecycle cost estimate for the APM DGR project, which is updated every 5 years and summarized in a public document. As part of these updates, NWMO is preparing the 2021 Transportation Lifecycle Cost Estimate (LCE) which includes a used fuel transportation system to safely move used fuel from interim storage sites to the proposed repository site. (page 7)

Source (document, presentation)	Date	Sample Excerpt
Preliminary transportation plan December 2021 (NWMO)	Dec-21	Canada's plan, also known as Adaptive Phased Management, calls for used nuclear fuel to be contained and isolated in a deep geological repository, a system of naturally occurring and engineered barriers, in an area with informed and willing hosts. A deep geological repository is a national environmental infrastructure project, aligns with international best practice, and benefits from the best available science and research, including Indigenous Knowledge. After gradually narrowing our focus based on social and technical studies, there are currently two remaining potential siting areas involved in the NWMO's site selection process: the Ignace area in northwestern Ontario, and South Bruce in southern Ontario. We expect to select a single, preferred site in 2023. A key component of Canada's plan is transporting used nuclear fuel to the deep geological repository site. Transportation will begin in the 2040s – once the repository is operational. (page 2)
Confidence in Transportation Package Peformance, APM-REP-04220-0209-R000	Sep-23	NWMO's responsibility includes designing and developing a transportation system for the safe and secure delivery of UNF from current interim storage locations to the deep geological repository. Current plans are to begin operations at the repository facility no sooner than the 2040s. The transport of UNF from the existing interim storage sites to the repository will commence once the facility is licensed and operational. NWMO is considering two transportation system options: an all-road option or an intermodal road/rail option to each potential host site. The transportation program is anticipated to take place over a period of approximately 45-50 years (page 2)

Source (document, presentation)	Date	Sample Excerpt
Confidence in Safety – Revell Site – 2023 Update NWMO-TR-2023-07 December 2023	Dec-23	Section 8 titled "Transportation" begins "The repository site needs to allow the safe and secure transportation of used fuel from storage sites. The NWMO will need to demonstrate that the repository is located in an area that: 1. is amenable to the safe transportation of used nuclear fuel. 2. allows appropriate security and emergency response measures during operation and transportation of the used nuclear fuel" and describes the transportation system, containers, mode and emergency repsonse in this 7 page section.
CANADIAN NATIONAL REPORT for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 8th Report	Aug-24	NWMO is responsible for implementing the Adaptive Phased Management (APM) approach that was selected by the Government of Canada for the long-term management of spent fuel (see sections G.7 and K.2. 2). (page 22)
CANADIAN NATIONAL REPORT for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 8th Report	Aug-24	The NWFA required nuclear energy corporations to establish a waste management organization (now called the Nuclear Waste Management Organization – The NWMO) as a separate legal entity to manage the full range of long-term spent fuel management activities. (page 60)
CANADIAN NATIONAL REPORT for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 8th Report	Aug-24	K.2.2.5 Engineering, safety and technical research Over the past three years, the NWMO's engineering program focused on advancing the design of the deep geological repository and continuing to develop the project's safety assessments. This included further development of the engineered-barrier system, including manufacturing and testing of several used fuel container and bentonite clay buffer prototypes. The NWMO has also been preparing conceptual designs of the deep geological repository for the two potential sites, conducting layout analysis for the Used Fuel Packaging Plant, and establishing the conceptual used fuel transportation system. (page 181)

Source (document, presentation)	Date	Sample Excerpt
CANADIAN NATIONAL REPORT for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, 8th Report	Aug-24	The focus of the work on transportation during the reporting period has been understanding the priorities of Canadians and Indigenous peoples related to transportation planning, documenting and incorporating these into the early planning. The NWMO actively sought feedback from Canadians and Indigenous peoples through engagement sessions, panel discussions, workshops and surveys, both virtually and in person. The work also continues to be guided by the Council of Elders and Youth and a new Community-Based Transportation Working Group, established in 2021. Based on the information gathered, a draft transportation framework in 2020 was published, summarizing the priorities that were identified and outlining a proposed approach to collaborative transportation planning. The NWMO then sought further input from people and communities about the draft framework and published the results in a What we heard report in 2021. The NWMO continues to engage with First Nation and Métis communities as transportation planning advances. Applying a Reconciliation lens to this work helps to fully understand how planning can be implemented in a sustainable way that considers how to plan for the next seven generations, takes into account Indigenous priorities and is guided by Indigenous knowledge. The NWMO's transportation planning remains a work-in-progress. The transportation framework is intended to be a dynamic document. The transportation planning documents will continue to be updated every three years to properly reflect planning priorities, questions and concerns as engagement continues with Canadians and Indigenous peoples. This is one of the ways the NWMO is committing to ensure that the planning is reflective of community values and future generations. (page 185)
Protocol among Canadian Nuclear Safety Commission, Impact Assessment Agency of Canada, and Nuclear Waste Management Organization, Version 2.0	Sep-24	Section 2.1 of the Administrative Protocol between NWMO, IAAC and CNSC states that "The NWMO is the proponent/applicant and has responsibilities under the NFWA to carry out Canada's plan to develop the Project, including the study and recommendation to the Governor in Council of the approach that was selected by the Governor in Council in 2007, and set out in Choosing a Way Forward.