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May 31, 2021

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Dear Mr. Delaney,

**Re: Region of Durham Response to Canadian Radioactive Waste  
Policy Review**

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As one of Canada's principal nuclear jurisdictions, the Region of Durham has an interest in the updating and strengthening of Canada's radioactive waste policy. Please find attached our submission to the review, which is based on a report and recommendations approved by Regional Council on May 26, 2021 (2021-COW-9).

If you have any questions with respect to the submission, please

[Redacted]  
[Redacted] in my department.

We appreciate the opportunity to participate in the review and look forward to further discussions.

Regards,

**Original Signed by**

[Redacted]  
[Redacted]

Enclosure

[REDACTED]



Response by the  
Regional Municipality of  
Durham  
to the Natural  
Resources Canada -  
Canadian Radioactive  
Waste Policy Review  
May 31, 2021



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**Purpose:**

This submission is provided to Natural Resources Canada (NRCan) in response to the review of Canada's radioactive waste policy launched in November 2020. It provides overarching recommendations endorsed by Durham Regional Council as well as comments, recommendations, and questions relating to the four discussion papers.

**Introduction: The Regional Municipality of Durham**

Ontario's municipalities play key roles in designing and delivering essential programs and services to meet the needs of their residents. The Regional Municipality of Durham (hereinafter Durham Region or the Region) is home to more than 700,000 people. It is an upper tier municipality in Ontario's system of two-tier municipal government. The upper tier is the regional level, which operates at a broader scale to provide planning, servicing, and financing for Region-wide services including policing, ambulance, emergency management, public health, land use planning, and water and wastewater services. For a more extensive list of Durham Region's legislated responsibilities see [Attachment 2](#).

Durham's eight local area municipalities (see map below) include The Municipality of Clarington and the City of Pickering. These area municipalities deliver services including detailed local planning, fire protection, tax collection and parks and recreation.

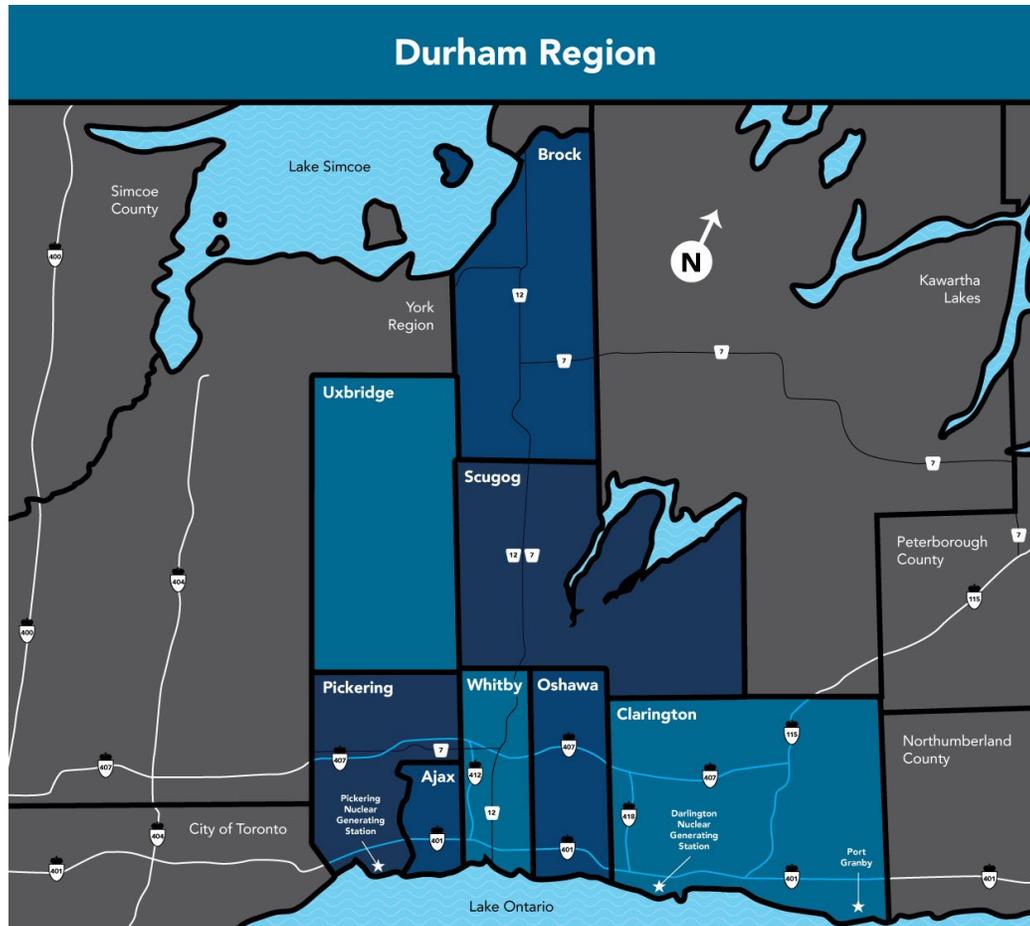
Durham Region is a leader in municipal efforts to address climate change. In January 2020, Regional Council declared a climate change emergency. To act on this direction, the Region is implementing programs to reduce greenhouse gas emissions and the impacts of climate change and to strive to be a carbon neutral community. The clean electricity supply from nuclear generation will help our community shift to low carbon energy.

As the site of two nuclear generating stations owned and operated by Ontario Power Generation (OPG), Durham Region is one of Canada's principal nuclear jurisdictions.

The Darlington Nuclear Generating Station (DNGS), with four CANDU (Canadian Uranium Deuterium) reactors, is located in Clarington in the community of Bowmanville. OPG is proposing to develop an on-grid small modular reactor (~300MWe) at a site directly adjacent to the existing DNGS. OPG presently is seeking a 10-year renewal of the licence to prepare this site for new nuclear development.

The Pickering Nuclear Generating Station (PNGS), with eight CANDU reactors (six now operating, two in safe storage), is located in the City of Pickering. This station is currently licenced to operate until the end of 2024 followed by four years of preparation for safe storage (to 2028).

The Port Granby Facility, part of the Port Hope Area Initiative to clean up historical radioactive contamination from the operation of Eldorado Nuclear from the 1930s to 1980s, is located at the southeast corner of Clarington.



Durham Region is a hub of nuclear academia, engineering and manufacturing including the Centre for Canadian Nuclear Sustainability. The Region is positioned to be the centre of excellence in Canada for nuclear generation, research and development, supply chain, deployment of innovative nuclear technology, nuclear waste minimization, decommissioning, and fuel recycling. The Region endorsed Canada's Small Modular Reactor (SMR) Action Plan statement of principles ([2020-EDT-9](#)) and has developed a chapter and local actions to help advance the sector.

## Context:

### Radioactive waste in Durham Region – past, present, future

Durham Region hosts a significant portion of Canada's radioactive waste at three sites – the Port Granby project, PNGS and DNGS. Details about the waste stored at each site are provided in [Attachment 1](#).

According to the most recent federal inventories, about 45% of Canada's used nuclear fuel (1,377,300 bundles) and 766,000 cubic metres of low-level radioactive waste are

stored at facilities in Durham.<sup>1</sup> This amount will grow due to extended operations of existing reactors, decommissioning of PNGS, and the potential addition of a SMR at DNGS. Accordingly, Durham Region has a strong interest in Canada's radioactive waste policy.

### **Durham engagement on radioactive waste policy**

Beginning in 2003, Durham Region staff participated in a series of Nuclear Waste Management Organization (NWMO) consultations on storing Canada's radioactive waste and responded to early discussion papers.

The early Council positions are reconfirmed and elaborated in reports and submissions to CNSC licensing hearings (2010, 2011, 2012, 2015, 2017). Regional Council continued to express support for expanded nuclear generation in the Region while simultaneously acknowledging the nuclear waste stored at the reactor sites.

This positioning reflected the social licence OPG had established with the host communities at the inception of the plants. Waste was to be stored at reactor sites on an interim basis until the generators could develop a permanent storage solution. Since 2010, the Region has urged the federal government to expedite development of the deep geological repository (DGR).

The Region also suggested the federal government and NWMO shift the focus from one of solving a nuclear waste disposal issue to one of putting Canada at the forefront of developing and delivering this technology.

On April 28, 2021 Regional Council recommended (2021-COW-8) that Durham Region request of NRCan and the Province of Ontario direction on the appropriate timing and venue for dialogue with Durham Region and other Canadian Association of Nuclear Host Communities (CANHC) members reviewing compensation for nuclear host communities, including but not restricted to interim storage of radioactive materials.

### **Summary of Overarching Recommendations:**

The policy that will guide management of radioactive waste in Canada must be an integral part of a broader national nuclear energy policy. Nuclear energy facilities will result in some radioactive waste or by-products. Separating the waste policy from broader considerations creates an artificial boundary – there is no uranium mining without tailings; there is no generation without spent fuel. Discussion of waste minimization, storage, decommissioning, and disposal needs an integrated approach to optimize the result. There are community benefits and impacts for host municipalities with the effects of these decisions lasting generations.

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<sup>1</sup> 2019 Inventory of Radioactive Waste in Canada from the Seventh Joint Report accessed at <https://nuclearsafety.gc.ca/eng/resources/publications/reports/jointconvention/seventh-report/seventh-report-joint-convention.cfm#secD-1-4> on May 12, 2021.

The Region provides the following overarching recommendations.

With respect to the Canadian Radioactive Waste Policy, Durham Regional Council recommends to Natural Resources Canada that Canada's revised radioactive waste policy generally should provide:

- 1) Formal recognition of host jurisdictions as respected partners in delivering solutions for radioactive waste and in managing the decommissioning process;
- 2) Guidance for federal nuclear agencies and owners/operators of nuclear facilities on how and when to engage with host jurisdictions in accordance with the policy principles;
- 3) Protection of host community well-being (health, social, economic and environmental) as a priority across all phases of a project that creates radioactive waste;
- 4) Federal funding for Durham Region, the Municipality of Clarington, the City of Pickering and the Canadian Association of Host Communities (CANHC) to support additional activities required of a nuclear host community and their participation in future licensing processes;
- 5) Mechanisms to compensate nuclear host communities for hosting radioactive waste on an interim or long-term basis;
- 6) Clear definitions of interim storage and long-term storage;
- 7) Federal support in advance of plant closure, during safe storage and during decommissioning phases to mitigate economic impacts and assist the host community with economic diversification and renewal;
- 8) Meaningful engagement of existing nuclear host communities in the discussions about options for long-term waste management, including transportation methods and routes;
- 9) A mechanism for licensing decisions to consider the need for social licence and assess socio-economic impacts on the host jurisdictions;
- 10) Management of nuclear waste as a consideration throughout the facility life cycle of a nuclear project from the earliest stages, designing for minimization and reduction from the outset; and
- 11) A focus on development of nuclear waste expertise to position Canada as a global leader and capable of capturing the international economic opportunities and addressing climate change goals.

Based on evidence to date, the Region supports the development of a centralized deep geological repository for used nuclear fuel as the safest option.

Additional comments, suggestions and recommendations are provided throughout the text in the section below entitled “Analysis, Comments and Recommendations.”

## **Analysis, Comments and Recommendations**

### **Principles**

During the Canadian Radioactive Waste Summit hosted online by the NWMO from March 30 to April 1, 2021, participants were asked to propose principles that should guide radioactive waste management in Canada.

The Region recommends the following key principles:

- a. Clear language and communication as the foundation of trust and transparency
- b. Scientifically sound, evidence-based decision-making
- c. Free, prior and informed consent of host communities
- d. Host communities are engaged in the project as respected partners (e.g. through shared decision-making)
- e. Waste management strategies are identified during the design process for new nuclear technologies and developed concurrently with the technology
- f. Human health and environmental stewardship are prioritized (e.g. do no harm, precautionary principle, protect the future)
- g. Polluter pays for environmental damages, waste solutions
- h. Accountability through independent, multi-disciplinary oversight

### **Recognition of host municipalities**

The mandate and jurisdiction of host municipalities in which waste processing, storage and decommissioning take place are not currently recognized in the federal legislation, regulation and policy related to nuclear projects. While public engagement is encouraged through the availability of participant funding for CNSC hearings and for federal impact assessments, it is not available to municipalities.

### **Recommendation: Eligibility criteria for CNSC participant funding should be expanded to include host municipalities as eligible applicants.**

In keeping with the principles listed above, the federal nuclear policy should recognize the role of host communities whether they are Indigenous communities, single tier or two-tier municipalities. The radioactive waste policy should recognize these host jurisdictions as respected partners.

The NWMO works directly with potential host municipalities in accordance with a list of 13 principles that it developed with stakeholders. There is no comparable, consistent process model required of owners/operators.

### **Recommendation: The federal policy should provide guidance for federal nuclear agencies and owners/operators of nuclear facilities on how and when to engage**

**with host jurisdictions in accordance with the policy principles and to ensure consistency in the treatment of host jurisdictions.**

In many nuclear host communities, the facility operator/generator is the largest employer. Local jobs in the nuclear supply chain and charitable contributions to community organizations, health care, and educational facilities provide valuable local benefits during the development and operational phases of the facility. As Crown agencies, nuclear facilities are often exempted from local fees and charges and given special property tax treatment. After facility closure and during the decommissioning phases, there may be a loss of direct and related employment and property tax revenue.

While developing and sustaining its economy are key goals for any community, municipal governments also have legislated duties to plan for and protect the health, safety and social well-being of residents, the environment and the fiscal position of the municipality, in the short and long term. Municipalities must plan for multi-generational socio-economic impacts.

To do so, these communities must develop and maintain nuclear expertise and capacity to participate in the regulatory process, educate their council and staff, and support community engagement.

Nuclear host communities and boards of health in Ontario face additional legislated responsibilities for emergency management and emergency response for nuclear and radiological emergencies. Their public health units conduct ongoing surveillance on health trends and report on potential impacts. There is no funding mechanism in place at the provincial or federal level, putting municipalities and public health units in the position of having to negotiate funding for these programs directly with nuclear operators.

Nuclear host communities incur operational costs and policy demands not faced by other communities. The documents related to the regulatory processes are long, complex, and technical. Communities may need to hire experts to assist them in identifying impacts and opportunities related to proposed waste storage or decommissioning approaches.

Over the next decade, eight licensing hearings are anticipated on the nuclear facilities in Durham Region. Each application will include some discussion of radioactive waste management. (See the chart below.)

<b>Timeframe</b>	<b>Type of CNSC application</b>
June 2021	Darlington Renewal Power Reactor Site Preparation License
July 2021	Port Granby Project (CNL) one-year license renewal
2022-23	Darlington Licence to Construct a new reactor
2022	Expected – Licence to extend PNGS operations to 2025
Early 2023	Darlington Waste Management Facility License Renewal

<b>Timeframe</b>	<b>Type of CNSC application</b>
Fall 2025	Darlington Nuclear Generating Station License Renewal
Spring 2027	Pickering Waste Management Facility, License renewal
2028	Darlington New Nuclear – Licence to operate a power reactor

The Region is working to build staff capacity to respond appropriately.

**Recommendation:**

**Provide federal funding to municipal host jurisdictions and the Canadian Association of Nuclear Host Communities (CANHC) to develop and maintain the expertise required to carry out the duties unique to nuclear host communities including:**

- **participating in the regulatory process, educating their council and staff, supporting community engagement and conducting surveys to gauge awareness;**
- **improving understanding of nuclear projects and achieving meaningful engagement in nuclear regulatory hearings, policy reviews, and impact and environmental assessments of proposed facilities;**
- **conducting surveillance of potential public health impacts, epidemiological analysis of surveillance data and trends over time;**
- **delivering programs and services in host communities using an evidence-based approach; and**
- **procuring experts to assist with these duties as required.**

**Assessment of community impacts**

Many significant nuclear projects are not included in the Project List under the federal Impact Assessment Act (IAA) 2019, which considers the range of environmental, health, social and economic effects of projects (previously Canadian Environmental Assessment Act - CEAA). Accordingly, projects including the world's largest decommissioning project at PNGS and the addition of interim storage facilities at reactor sites are considered through a narrowly defined CNSC environmental assessment process or hearing.

**Recommendation: The radioactive waste policy should include a mechanism for assessing social licence and socio-economic impacts of decommissioning and projects involving new or expanded radioactive waste processing, storage and disposal at a nuclear facility.**

The Ontario government has committed to nuclear energy as part of the provincial energy supply mix. In future, this may include distributed generation, storage, conservation and hybrid or community systems. The radioactive waste policy should be one element of the nuclear energy section of an integrated national energy framework. Energy generation should be subject to a consistent policy and regulatory “playing field”. In this way, energy alternatives (and their by-products) can be properly evaluated for sustainability, suitability, and environmental, social and economic outcomes over their life cycle.

**Recommendation: The Government of Canada should update and expand its radioactive waste policy to reflect current energy imperatives.**

### **Lack of formal policy on low and intermediate level waste**

Currently, the federal policy framework makes low and intermediate level waste the responsibility of the waste owners. As a result, ad hoc approaches have been developed, while licensing decisions have set precedents or become accepted practice.

The Port Hope Area Initiative, the agreement made by the federal government with the two affected communities to permanently host the low-level radioactive waste, establishes an informal benchmark. This agreement includes provisions such as lump-sum compensation and property value protection. It provides a model that other host communities may adopt.

**Recommendation: Ensure that federal nuclear policy and regulatory processes support and protect host community well-being (health, social, economic and environmental) across all phases of a nuclear project. Such policies and processes may include:**

- **Requiring and supporting meaningful community engagement across the entire lifecycle of the proposed or expanding nuclear facility; and**
- **Supporting fair compensation to jurisdictions that host nuclear waste.**

### **Comments on the Radioactive Waste Discussion Papers**

Comments, questions, and recommendations related to the four discussion papers are provided below.

#### **Waste Minimization Discussion Paper**

The questions in this discussion paper ask about the value of the concept of the waste hierarchy, the appropriate role of government in terms of waste minimization, and any additional principles needed in designing a waste minimization program.

The Region supports the concept of the radioactive waste hierarchy (preventing, reducing (minimizing), reusing, recycling). Based on our experience managing municipal waste, the radioactive waste policy should require the nuclear industry to design products, processes, facilities, and packaging to prevent and minimize waste and to support repair

and reuse. These factors must be considered early in the design of a facility and its operations. Facility designs must consider how waste minimization will be achieved not only during operational phases but also at the end of the facility lifecycle.

Host communities need clear information about the impact of waste minimization as a primary approach for low and intermediate level waste including information on the safety of waste minimization, the percentage/volume of waste that is anticipated to remain, and plans for the long-term storage of minimized waste.

As long-term storage facilities will be required to store the residual waste, the development of both minimization and storage technology options should be pursued concurrently in an expedited manner.

Waste minimization should be a key design criterion for SMRs. The federal government should begin work now with generators to support and deliver waste solutions/disposal facilities. This would ensure that communities that may host SMRs in future will have a clear picture and timeline for how the related waste will be handled as part of their decision making.

The NWMO used fuel DGR is being designed to house CANDU fuel. Various SMR fuels are being considered and will require specific disposal containers and approaches. Clear processes, standards and timelines for addressing the waste must be developed and integrated at the SMR design and approval stage.

To encourage the minimization of radioactive waste, communities hosting radioactive waste could be annually compensated per kilogram of radioactive waste stored onsite, indexed to inflation, until the site is released from regulatory control.

If no impact assessment is required for nuclear projects (e.g. small modular reactors, interim waste management facilities) the policy should require rigorous community engagement on all phases of the project (including waste management) and assessment of community and socio-economic impacts. This will be crucial for decisions by small and remote communities and recognizes that communities are in the best position to determine their future goals and direction.

### **Waste Storage Facilities Discussion Paper**

The questions in this discussion paper ask for views on how radioactive waste is currently stored in Canada and what the roles and responsibilities of government, regulator and waste owners should be.

Radioactive waste (primarily used fuel) at nuclear plants in Durham Region is safely stored in strictly regulated interim waste management facilities. The CNSC has directed OPG to build sufficient interim storage facilities for the used fuel and refurbishment waste that will be created from these operations.

The CNSC approved numerous waste storage buildings at OPG's Pickering Waste Management Facility and at the Western Waste Management Facility (WWMF) in

Kincardine in 2017. These were all considered interim waste management facilities, excluding them from the federal EA process.

*In situ* (in place) waste storage solutions are not recommended by the International Atomic Energy Agency (IAEA).

**Recommendation: Interim storage should be defined in the policy (duration in years) to ensure that host communities are fully informed, and that it is clear what projects are covered by the federal Impact Assessment Act (IAA) project list. Long term storage should also be defined.**

NRCan should consider adding a process to identify and address situations where the original assumptions on which a nuclear project approval was based have changed significantly. This process should review the previous decision and amend it as needed to retain social licence, mitigate impacts on the community and revise future phases of the facility plan.

The policy should also support host communities to develop, routinely update and deliver the communications plans that support community awareness, engagement and knowledge transfer over generations that a waste site will continue to be under safety controls.

In communities where used fuel and other radioactive wastes are to be removed to an off-site storage or processing location, community engagement will be essential in planning the transportation method and route.

**Recommendation: The radioactive waste policy should require that current host communities, communities along the transportation route and destination communities all be engaged, where applicable.**

With respect to the appropriate roles for government, generators and regulators, the NWMO was created to take a project management approach leading to a science-based, socially acceptable solution for nuclear waste. This produced some tangible progress, particularly on engineering challenges. The NWMO is undertaking a collaborative and adaptive process to identify a site for Canada's used nuclear fuel, however, federal government leadership and action are still required to address concerns among Indigenous communities that are entitled to government-to-government relationships and negotiation.

The NWMO's role in radioactive waste management is to deal with used fuel once it leaves the reactor site for a long-term waste facility. The generator is responsible up to that point. The radioactive waste policy should ensure that, regardless of the used fuel storage location, host communities are engaged in a manner that reflects the waste policy principles and best practices.

While the NWMO's technical expertise and community engagement strategies are respected, creating a more diverse board of directors (currently comprised of former and

current nuclear industry executives) could be an avenue to effectively broaden the perspective and effectively engage host jurisdictions and Indigenous communities.

CNSC staff are respected nuclear experts leading a complex regulatory process. However, CNSC states that socio-economic impacts and social acceptability are not within the mandate. The mandate of the CNSC should be expanded to include socio-economic impacts. Additionally, NRCan should consider providing guidance or best practices on maintaining social licence and developing partnerships with existing and potential host communities as part of the radioactive waste policy, to ensure such impacts are considered.

NWMO and CNSC experts know the technology, the regulatory process and one another well. They speak the same technical language. Communicating with the public and communities requires a different approach. To build trust, it is critical that these communications use precise, plain, and understandable language about radioactive waste. Commitment to this clear communication from credible, neutral sources should be a pillar of the policy.

To support and maintain host community confidence in a waste storage facility over the long term, a key role of waste owners is to monitor and report on the ongoing performance of interim or long-term waste storage facilities. Any spills/releases can present a risk to the environment, to the health and safety of the community in the area near the spill, and to the water supply. In most instances, waste owners immediately notify first responders, municipalities, and the provincial emergency management agency in addition to the CNSC. This approach should be adopted in policy as a standard for the sector with training exercises to reinforce it. It is critical to ensure that incidents are reported and addressed in a timely manner, to prevent and mitigate any potential effects on human health and the environment.

**Recommendation: An updated radioactive waste storage policy should formalize best practices with firm commitments by the owner of the facility to environmental monitoring, regular reporting, training on and adherence to legislated local protocols for spills notification and cleanup procedures.**

### **Decommissioning Discussion Paper**

This discussion paper asks what important policy considerations should influence the choice of decommissioning strategies by nuclear operators and the setting of end state objectives for decommissioning.

Once a nuclear generating facility reaches the end of operating life, a decommissioning process ensues. A preliminary decommissioning plan (PDP) is developed early in the facility lifecycle and is periodically updated. About five years before dismantling and demolition begin, a new, more detailed decommissioning plan is developed to support the application for a licence to decommission. For PNGS, detailed decommissioning planning will occur in the 2050s. For DNGS it would take place in the 2080s.

The discussion paper describes three approaches to decommissioning: prompt, deferred and *in situ*, which is generally a method of last resort for legacy waste or accident situations.

OPG plans deferred decommissioning for its nuclear generating stations including a 30-year period when the facility is maintained in safe storage mode. The decommissioning timeframe for Pickering extends from the end of operations in 2024 to site restoration in about 2065. The City of Pickering has advocated for a prompt decommissioning approach at PNGS (January 2020). Completion of either approach relies on the availability of long-term waste storage or disposal facilities. *In situ* decommissioning of a plant as large as Pickering within an urban area would not be practical.

The community aspect of closure and decommissioning planning must begin well before the end of operations. Economic impacts begin at the point of closure and continue through the safe storage phase with reduced plant staffing, loss of local supply chain and reduced property tax revenues. Maintaining the plant in safe storage for 30 years means fewer jobs or economic prospects are associated with this phase.

The decommissioning of PNGS will be the largest project of its kind in the world to date. It offers a unique, “first of a kind” economic opportunity as a site for research and development of best practice approaches for decommissioning the fleet of ageing CANDU reactors around the world. OPG has established the Centre for Canadian Nuclear Sustainability in Pickering to help pursue this opportunity. Federal policy should support this through ongoing funding, research, and programs to advance the science, develop the required technology and support community economic renewal.

In the case of Pickering, the development of a decommissioning centre of expertise and technology is likely to be a key element of an economic renewal strategy, but this will not be available to every host community. The policy will need to support diverse forms of economic renewal for all decommissioning communities. The goal is to mitigate job loss and supply chain impact by renewing and diversifying the local economy in advance of plant closure.

To better understand the impacts of the retirement of PNGS, the City of Pickering, the Region and OPG are conducting a study of socio-economic and fiscal impacts at the City and Regional scales. The results are expected by year end and may include insights that could further inform NRCan’s policy development.

Such initiatives could be identified in the policy as potential best practice examples for closure and decommissioning.

The federal radioactive waste management policy must clearly protect the sustainability of nuclear host communities whether in Indigenous territory, single tier, or two-tier municipalities. Plans for forecasting, mitigating, and monitoring community impacts at the dismantling, demolition, transportation, and site restoration phases should be included in the decommissioning plan and a related environmental assessment.

Because the timeframes for nuclear operations are so long, the radioactive waste policy should recognize that the future is uncertain. Ownership and regulatory structures may change. Political shifts, pandemics, economic shocks, and climate change can all impact legislative and policy regimes. The policy must ensure that obligations to safely manage radioactive waste pass from current organizations to successor organizations.

Decommissioning policy should require that host municipalities are included in discussions of transportation planning for radioactive waste and other materials, including agreement on route planning, impact mitigation and road improvements. To support road improvements, several years lead time is needed for the municipality to complete environmental assessment, planning and road design.

The federal policy should allow the regulator and the community to revisit the end-state plans at least every decade to ensure that the plan continues to reflect best practices and the changing needs of the community.

**Recommendation: The policy should include direction on how and when a facility owner, the NWMO and the regulator will engage with the municipality, Indigenous community, and the general public during the closure and decommissioning processes to prepare for the physical, socio-economic, and fiscal impacts of this process.**

### **Waste Disposal Discussion Paper**

This discussion paper asks what should influence the choice of disposal approaches by waste owners and should be considered as part of Canada's radioactive waste policy. It also asks about the roles that should be played by the government, regulator and waste owners in regard to funding, institutional control and involvement of the public and Indigenous communities in site selection.

Based on the evidence to date, the Region supports the development of a centralized deep geological repository for used CANDU fuel as the safest option. Reactor host communities should be consulted and engaged in the development of plans and timelines for the removal of the nuclear waste, as soon as a DGR site is selected.

Since it will take some time to load the fuel into the facility before it is sealed, the option to retrieve it for reuse in a future reactor will be available for some time. Flexibility to adapt to new technologies should be retained, if possible.

Demonstrating that waste minimization and permanent disposal of the nuclear wastes is achievable will be vital to gaining support for the use of nuclear energy as a key strategy in reaching GHG reduction targets.

A separate waste management and disposal effort for SMRs will be needed. The work underway on a storage solution for CANDU fuel should not be interrupted or delayed. SMRs will use new fuel types, create different decommissioning wastes, and may involve new transportation challenges from remote/northern communities. A different style and

location of storage may be more suitable. SMRs should be designed with the future waste management strategy or solutions in mind.

To support transparency and public accountability of the federal government, its nuclear agencies, facility owners and generators, creation of a multi-disciplinary, multi-stakeholder oversight office is recommended. This body could be charged with periodically evaluating the performance of the radioactive waste policy in reaching its objectives, mediating disputes, and identifying needs for systemic change in a rapidly evolving sector.

## **Conclusion**

Durham Region is a principal nuclear jurisdiction in Canada that currently houses a considerable portion of Canada's nuclear waste. For decades, Durham Region and other nuclear host communities have helped Ontario and Canada transition away from carbon-intensive energy sources. The Region supports the continued development of plentiful, virtually carbon-free nuclear energy as a critical tool in assisting Canada to shift to a low carbon economy and reach the climate change objective of net-zero by 2050. Canada has an economic and environmental opportunity to develop expertise and technology to deal with radioactive wastes for use on a global scale.

This submission outlines the history and status of nuclear waste storage in the Region and the role of nuclear host communities. It suggests ways to address gaps in Canada's radioactive waste policy and responds with comments on the four NRCan discussion papers. It makes recommendations and suggestions for inclusion in the new federal policy based on the Region of Durham's expertise as an informed nuclear jurisdiction and the Clean Energy Capital of Canada.

## Attachment 1: Radioactive waste stored in Durham Region

### Port Hope Area Initiative

The Port Hope Area Initiative (PHAI) is a federal initiative for the remediation of contaminated sites and safe, long-term management of historic low-level radioactive waste resulting from the operations of the Eldorado Nuclear Limited. This uranium refinery operated in Port Hope from the 1930s to the 1980s. The estimated 2 million cubic metres of low and intermediate level waste and contaminated soils in the Port Hope<sup>2</sup> area represents 93% of the historic low-level radioactive waste in Canada<sup>3</sup>.

The Port Granby site at the south-eastern boundary of the Municipality of Clarington contained low level radioactive waste and contaminated soils deposited between 1955 and 1988. Approximately 765,600 cubic metres<sup>4</sup> of this material is being relocated from an old waste facility on the shore of Lake Ontario to a new, engineered above ground mound about a kilometre north. The Port Granby project is managed by Canadian Nuclear Laboratories (CNL). It includes a wastewater treatment facility and internal haul route for movement of the contaminated material.

This management approach was selected following the Environmental Assessment (EA) for the Port Granby Project, conducted from 2002 to 2008, which included detailed environmental and technical studies and extensive public consultation. It was endorsed by the federal government and the Municipality of Clarington Council. The site is owned by the federal government.

In 2011, the CNSC granted a licence for the Port Granby Project to proceed. In 2012, Canada committed \$1.28 billion for the PHAI, including \$273 million over 10 years for the Port Granby Project.

Site preparation work began in 2015. The wastewater treatment plant to remove contaminated sediments was completed in 2016. The Port Granby long-term WMF has a revised design capacity of around 900,000 cubic metres.<sup>5</sup> After relocation of the excavated material concludes, the mound will be capped and closed by about 2023. The site is to be restored to a naturalized condition with systems in place to monitor the site for hundreds of years. Clarington has confidence in the long-term storage facility being developed at Port Granby.

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<sup>2</sup> From the Seventh Canadian National Report for the Joint Convention accessed at <https://nuclearsafety.gc.ca/eng/resources/publications/reports/jointconvention/seventh-report/seventh-report-joint-convention.cfm#secD-1-4> on May 12, 2021.

<sup>3</sup> 2016 Inventory of Radioactive Waste in Canada.

<sup>4</sup> 2019 Inventory of Radioactive Waste in Canada from the Seventh Joint Report accessed at <https://nuclearsafety.gc.ca/eng/resources/publications/reports/jointconvention/seventh-report/seventh-report-joint-convention.cfm#secD-1-4> on May 12, 2021.

<sup>5</sup> Ibid, Annex 7, section 7.2.1.

## Pickering Nuclear Generating Station

The Pickering Nuclear Generating Station (PNGS) began operating in 1971. This station currently houses 396,935 bundles of used nuclear fuel<sup>6</sup> in wet storage (cooling pools) and 395,494 bundles in four dry storage facilities. Two additional waste management buildings and a new processing building are planned by 2028. Low and intermediate level waste from Pickering operations has historically been shipped for processing and storage at the OPG Western Waste Management Facility in Kincardine. There is also 1012 cubic metres of intermediate level waste from the refurbishment of Pickering A stored in dry storage modules.<sup>7</sup> The used fuel and intermediate level wastes are safely stored in interim waste facilities licensed by the CNSC.

The current operating licence allows OPG to operate PNGS until the end of 2024 and then begin the first steps of decommissioning (defueling, dewatering, preparing for safe storage) until 2028. The total projected used fuel waste by the end of that process would be 781,000 bundles. The Province of Ontario has asked OPG to seek CNSC approval to operate some reactors through 2025.

According to OPG's Pickering Preliminary Decommissioning Plan (PDP), the used fuel will remain onsite until the NWMO DGR is available. Dismantling and demolition of the station will not begin until all used fuel has been removed.

The decommissioning process will produce 62,016 cubic metres of low-level radioactive waste and 6,102 cubic metres of intermediate-level waste<sup>8</sup>. According to the PDP, this waste was to be sent to the proposed low and intermediate level waste DGR in Kincardine, Ontario. However, OPG withdrew the DGR application in Spring 2020. Restoration of the Pickering site for beneficial re-use occurs after the low and intermediate level waste is removed.

## Darlington Nuclear Generating Station

The Darlington Nuclear Generating Station (DNGS) currently houses 313,853 bundles of used nuclear fuel in wet storage and 271,015 bundles in dry storage containers. In addition, 628 cubic metres of intermediate level retube waste is stored on site in regulated containers.<sup>9</sup> With the refurbishment underway, generation at the site is expected to conclude in 2055, at which point there will be 1,271,000 used fuel bundles on site.

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<sup>6</sup> All references to amounts of used fuel waste are from the NWMO-TR-06 Nuclear Fuel Waste Projections in Canada, 2020 Update.

<sup>7</sup> From the 2019 Inventory of Radioactive Waste in Canada in the Seventh Canadian National Report for the Joint Convention accessed at

<https://nuclearsafety.gc.ca/eng/resources/publications/reports/jointconvention/seventh-report/seventh-report-joint-convention.cfm#secD-1-4> on May 12, 2021.

<sup>8</sup> Ibid.

<sup>9</sup> Ibid.

The refurbishment project produces low and intermediate level waste which is also being stored onsite. Used fuel and intermediate level wastes are safely stored in interim waste facilities licensed by the CNSC.

### **Darlington New Nuclear Project (DNNP)**

The site approved by a federal Joint Review Panel in 2012 for the DNNP adjoins the existing DNGS site to the east and is the only site in Canada currently licensed for new nuclear development. Until a reactor technology and generation capacity is selected the amount of radioactive waste that will result from the operation and decommissioning of the reactor is unknown.

The waste from SMRs will fall under the same legislative framework as that from existing reactors. [NRCAN anticipates](#) that the NWMO will work with the owners/operators of SMRs to plan for management of wastes associated with these reactors. In the absence of an established offsite repository, wastes are likely to remain stored at the reactor site.

## Attachment 2: Legislated Responsibilities of the Regional Municipality of Durham

The following chart lists key pieces of applicable legislation for Durham Region but is not an exhaustive list.

<b>Regional Responsibility:</b>	<b>Legislation:</b>
Borrowing of Money for Capital Expenditures of Upper and Lower Tier Municipalities	Municipal Act, 2001.
Community and Land Use Planning including: the Regional Official Plan and implementation thereof; approval authority function for lower-tier municipal official plans and amendments thereto; industrial, commercial and residential development approvals; Land Division consent applications; administration of development charges; strategic land use planning; plan of subdivision and condominium approvals; and site plan application commenting function.	Planning Act; Greenbelt Act, 2005; Oak Ridges Moraine Conservation Act, 2001; Oak Ridges Moraine Protection Act, 2001; Lake Simcoe Protection Act, 2008; Places to Grow Act, 2005; Development Charges Act, 1997; Environmental Protection Act.
Economic Development and Tourism	Municipal Act, 2001
Emergency Management including detailed arrangements and procedures for implementing precautionary and protective measures; detailed planning for public alerting system requirements, public education program, and provision of emergency communications; arrangements to receive and accommodate evacuees; carry out the required response as prescribed by the province; conduct training and exercises to prepare Regional staff; ensure availability of essential facilities, emergency centres, resources and equipment required by the Region to respond.	Emergency Management and Civil Protection Act, Provincial Nuclear Emergency Response Plan, 2017.
Emergency Services including: 9-1-1 management; land ambulance services and police services.	Municipal Act, 2001; Ambulance Act; Police Services Act; Development Charges Act, 1997.
Policing	Several acts recently amended by the Safer Ontario Act 2018 including for example the Police Services Act.
Property taxes.	Municipal Act, 2001; Assessment Act; Electricity Act, 1998.
Provincial Offences Court including prosecution services, court administration and collection of fines.	Provincial Offences Act.
Public Health programs, services and Paramedic Services.	Health Protection and Promotion Act, the Ambulance Act, and numerous other acts and regulations which reference public health.

<b>Regional Responsibility:</b>	<b>Legislation:</b>
Regional roads, bridges and traffic signals.	Municipal Act, 2001; Planning Act; Highway Traffic Act; Development Charges Act, 1997.
Social Services including arrangements to receive and accommodate evacuees, childcare centres, nursery school programs, Durham Behaviour Management Services (children), family counselling, long-term care and services for seniors, Ontario Works, and social housing.	Municipal Act, 2001; Day Nurseries Act; Child and Family Services Act; Ontario Works Act, 1997; Ontario Disability Support Program Act, 1997; Family Benefits Act; Social Housing Reform Act, 2000; Occupiers Liability Act.
Solid Waste Management including diversion, recycling, compostables, yard waste, white goods and bulk items.	Development Charges Act, 1997; Municipal Act, 2001; Resource Recovery and Circular Economy Act, 2016, Waste Diversion Transition Act, 2016, Environmental Protection Act.
Transit and specialized transit services.	Municipal Act, 2001; Accessibility for Ontarians with Disabilities Act, 2005.
Water infrastructure and services: drinking water supply, treatment, distribution and billing.	Development Charges Act, 1997; Municipal Act, 2001; Ontario Water Resources Act; Safe Drinking Water Act, 2002; and Clean Water Act, 2006.
Wastewater infrastructure and services sewage collection, treatment and billing.	Development Charges Act, 1997; Municipal Act, 2001; Ontario Water Resources Act.
By-law enforcement.	Numerous Acts and Regional By-laws.

References to Acts include references to applicable Regulations and Plans.

Additionally, the Region has numerous agreements with public-sector partners that may govern the activities noted above, in addition to Council-adopted policies and initiatives that may be applicable, including:

- a. Durham Region Strategic Plan 2020-2024
- b. Durham Region Official Plan
- c. Transportation Master Plan 2018
- d. Long Term Transit Strategy 2015
- e. Long Term Waste Management Strategy 2021 - 2040
- f. 2021 Regional Business Plans and Budgets
- g. 2019 Asset Management Plan and 2020 Corporate Asset Management Update Report
- h. Annual Accessibility Plan (covers all regional services per Ontarians with Disabilities Act, 2001)
- i. Durham Regional Police Strategic Business Plan (3-year plan)
- j. From Vision to Action, Region of Durham Community Climate Change Local Action Plan, 2012
- k. Towards Resilience: Region of Durham Community Climate Adaptation Plan 2016
- l. Durham Community Energy Plan 2018

While this list is not exhaustive, it includes the key documents that lay out the framework for the Region's infrastructure and relevant services.