

Darlington New Nuclear Project

DNNP Workshop Summary Report

Summary

As a modern and agile nuclear regulator, the Canadian Nuclear Safety Commission (CNSC) aims to be recognized as a trusted regulator and a source of objective scientific, technical, and regulatory information. The CNSC strives to build trust with the public and be transparent in its engagement and outreach efforts, by providing opportunities to engage directly with staff and subject matter experts in several formats.

In April 2023, the CNSC hosted a workshop with members of the public, Indigenous Nations and communities, as well as members of the public to hear comments and concerns on two documents submitted to support Ontario Power Generation (OPG's) review of the applicability of the Darlington New Nuclear Project (DNNP) Environmental Assessment to the BWRX-300 reactor. CNSC staff presented general information about the regulatory process and the DNNP and provided a summary of OPG's assessment of the applicability of the EA. Due to the volume of comments received, CNSC staff scheduled the workshop as a structured discussion, with participants organized into groups based on the themes of their submissions. However, participants commented that the format did not allow for full participation on all relevant topics. CNSC staff accepted and acted upon the feedback and adjusted the workshop by eliminating the breakout focus groups and having a full group discussion.

Participants also commented on the difficulty in locating information relevant to the DNNP, as it is often spread across multiple government websites and is sometimes presented in an inaccessible manner. The CNSC is committed to improving information availability and access. As such, CNSC staff have placed all DNNP-specific information or links to OPG's website, CEAA registry or other sources of DNNP information in a single location on the Open Government Portal website.

This report is a summary of the feedback and comments received from participants in the DNNP workshop, and staff will take all comments received into consideration for future Commission Member Documents (CMD) and for ongoing engagement and outreach activities.

Introduction

The Canadian Nuclear Safety Commission (CNSC) regulates nuclear energy and materials to protect the health, safety, security, and the environment in Canada. In doing so, the CNSC aims to be recognized as a trusted regulator, and a credible source of scientific, technical, and regulatory information. To achieve this, the CNSC undertakes a variety of activities, including, hosting Meet the Nuclear Regulator sessions, engaging municipalities and local organizations, developing Terms of Reference for long-term engagement with interested Indigenous Nations and communities, as well as workshops to inform and discuss concerns about potential nuclear projects.

On April 4th, 2023 the CNSC hosted a workshop with members of the public, Indigenous Nations and communities, civil society and environmental non-governmental organizations to discuss two key documents submitted as part of [Ontario Power Generation's \(OPG\) Darlington New Nuclear Project \(DNNP\)](#) Licence to Construct application: 1) the Updated Plant Parameter Envelope Report, and; 2) the Environmental Impact Statement Review Report. These documents were submitted by OPG to the CNSC to demonstrate that the selected technology, the GE-Hitachi BWRX-300, remains within the bounds of the previously approved 2012 environmental assessment.

The workshop was an opportunity to discuss comments received on these documents. These comments were received via e-mail or the *Let's Talk Nuclear Safety* consultation platform and informed the content of the workshop. Comments received during the workshop will help the CNSC to better understand concerns about the project and may inform CNSC recommendations to the Commission at future hearings, including the January 2024 Commission proceeding.

Background

In 2006, OPG proposed the DNNP to construct and operate up to four new nuclear reactors at the existing Darlington site in the Municipality of Clarington, on the north shore of Lake Ontario in the Region of Durham.

In 2009, OPG submitted an environmental impact statement and an application for a licence to prepare site to the CNSC. The CNSC issued a Licence to Prepare a Site in 2012, which was renewed in 2021 and is set to expire in 2031. The Joint Review Panel (JRP), that was considering the project as per the *Canadian Environmental Assessment Act 2009*,

released its report on August 25, 2011, and presented 67 recommendations in its report, including recommendation 1:

The Panel understands that prior to construction, the Canadian Nuclear Safety Commission will determine whether this environmental assessment is applicable to the reactor technology selected by the Government of Ontario for the Project. Nevertheless, if the selected reactor technology is fundamentally different from the specific reactor technologies bounded by the plant parameter envelope, the Panel recommends that a new environmental assessment be conducted.

The [Government of Canada response](#) to the JRP report concluded that no significant adverse environmental effects were likely if all mitigation measures were implemented. OPG is required to demonstrate that its chosen technology fits within the bounds of the approved environmental assessment and to assess the potential effects on any parameters that are outside the previously approved bounding approach.

In October 2022, OPG submitted an application to the CNSC for a licence to construct one small modular reactor (SMR). In response to JRP recommendation 1, OPG submitted the following 2 documents to provide updated details on the selected BWRX-300 technology, and to compare this selected technology to the specific reactor technologies bounded in the original 2009 submission:

- **Environmental Impact Statement Review Report (EIS Review Report)**, documents OPG's review of the 2009 environmental impact statement to demonstrate that the results remain valid with the BWRX-300.
- **Updated Plant Parameter Envelope Report (PPE Report)**. A PPE is a listing of values used in the environmental assessment and licence application to assist in predicting the potential safety and environmental effects of a nuclear power plant at a particular site. OPG submitted the updated report to assess the effects of BWRX-300 parameters and how that compares to the bounding 2009 PPE accepted by the Government of Canada.

OPG concluded that the BWRX-300 remains within the bounds of the approved environmental assessment, addressing JRP recommendation 1. Both documents were made available on *Let's Talk Nuclear Safety* for public review and comment between

December 2022 and March 2023. Participant funding was also made available by the CNSC under its Participant Funding Program between January 2023 and March 2023 to assist members of the public, Indigenous Nations and communities, and stakeholders in reviewing the two documents.

The CNSC received a total of 188 comments through email and *Let's Talk Nuclear Safety* that focused on the following thematic areas, some of which over-lap:

THEME	Number of Comments
Design & Analysis	26
Effluents & Releases	7
Emergency Management	16
Environmental Effects & Risk Assessments	49
Radiological Dose	8
Wastes	28
Safeguards	1
Hazards Assessment	8
Licensing	13
General	28
TOTAL	188

All the comments received through the CNSC's Participant Funding Program can be found in Annex B.

The Workshop

The purpose of the workshop was threefold: 1) to engage participants on OPG's PPE Report and EIS Review Report; 2) to provide participants a transparent view of the activities undertaken as part of CNSC's licensing review process in advance of the Commission proceedings and; 3) to gather feedback early in the licensing process to help CNSC staff better understand participant concerns. Feedback received during the public consultation will be taken into consideration during CNSC staff's technical review for the upcoming Commission proceedings.

The full-day, virtual workshop welcomed over 17 participants representing the Canadian Environmental Law Association, the Nuclear Transparency Project, Canadian Coalition for Nuclear Responsibility, Northwatch, Durham Nuclear Health Committee, Mississaugas of Scugog Island First Nation, Six Nations of Grand River, Curve Lake First Nation, Hiawatha First Nation, the Radiation Safety Institute of Canada, and the Mayor of the Municipality

of Clarington. Staff from Environmental and Climate Change Canada and the Fisheries and Oceans Canada, OPG, and technical specialists from the CNSC also attended.

In the morning of the workshop, OPG introduced the DNNP and a summary of results from the updated PPE and EIS Review Reports. CNSC staff provided an update on the technical review of OPG's documents as well as the licensing timeline for review of OPG's licence to construct application. CNSC staff also gave an overview of the comments received on the 2 reports leading up to the workshop, and the technical comments CNSC staff provided to OPG. In the afternoon of the workshop, CNSC staff facilitated an open discussion based on the themes that received the most comments, namely:

- Environmental Effects and Risks Assessments
- Waste Management and Decommissioning
- Design & Analysis and Hazard Assessment
- Releases, Doses and Emergency Management

These themes were initially to be discussed in thematic break-out rooms, however, after listening to the preferences and feedback of the participants for how they wanted to be engaged, these topics were discussed in an open forum with all in attendance.

What We Heard

The following section summarizes the key themes of issues, concerns, and recommendations that we heard from participants. The timing of the workshop provides participants an opportunity to elaborate on comments and share additional insights that CNSC staff will consider as we continue our regulatory review of OPG's licence to construct application.

Environmental Effects and Risks Assessment

Environmental Assessment

- OPG should augment the 2009 environmental impact statement with additional information which would provide the data required for the independent verification of numerical values that are assigned to various parameters.
- OPG should provide greater transparency on how it justified the project remaining within the original approved environmental assessment.
- OPG should provide access to the specific information it is relying on to make the claim that the selected technology remains within the bounds of the plant parameter envelope.

Environmental Effects

- OPG should conduct an assessment that adequately evaluates the potential environmental effects of the BWRX-300 to improve confidence in maintaining the original environmental assessment.
- OPG should perform a more robust analysis on the BWRX-300's potential effects on groundwater wells, terrestrial and aquatic ecosystems, and storm water infrastructure.
- OPG reports should be strengthened with a consideration of the environmental effects and dose impacts of the BWRX-300's noble gas releases.

Species at Risk

- CNSC and OPG should understand that within Indigenous Knowledge systems, birds and animals are living beings and not just valued ecosystem components. Documentation should consider this world view when determining the project's potential effects on species.
- CNSC and OPG should consider species at risk and cultural keystone species when environmental monitoring and ecological surveys are performed. Protective measures should be outlined in a long-term ecological management plan.
- OPG should provide more information regarding measures that will be taken to protect natural environmental features and habitats during, and post construction.

The Environmental Effects and Risk Assessment theme also attracted cross-cutting comments regarding barriers to accessing documents. Participants identified that greater transparency can be achieved by the CNSC by enhancing its proactive disclosure practices and allowing documents to be easily downloaded directly from nuclearsafety.gc.ca and keeping all documents in one location. Participants raised similar concerns to OPG and noted OPG should prepare reports in a manner that the public can comprehend.

Waste Management and Decommissioning

Waste Management, Inventory and Storage

- Consulting with Indigenous Nations and communities and engaging with local governments should be paramount to all discussions relating to spent fuel management, and the siting of a deep geological repository.
- OPG should provide a strengthened rationale for why the EIS is still appropriate, despite an acknowledgment by OPG that the BWRX-300's production of solid waste will be higher.

- OPG should provide greater information regarding the location of waste storage facilities in the conceptual plant layout.
- The Nuclear Waste Management Organization should clarify its mandate and authority to weigh-in on the future location of a deep geological repository, and how it will accommodate the BWRX-300's fuel assembly.

Decommissioning

- OPG should document a non-theoretical decommissioning strategic plan designed specifically for the BWRX-300, and its impact on the environment, to demonstrate that the technology remains within the bounds of the Government of Canada's accepted PPE.
- OPG should demonstrate that both reports comply with the International Joint Commission's Great Lakes Water Quality Board recommendations and the International Atomic Energy Agency's conclusion that immediate dismantling is the preferred decommissioning strategy for nuclear reactors.
- OPG should describe how lands will be restored after the site is decommissioned, including whether the area will become Crown Land after decommissioning.

Overall, participants were keen to gain access to enhanced information on waste generation, characteristics, storage, and financial guarantees, would provide the public with a better understanding of OPG's Radioactive Waste Management Plan and decommissioning strategy.

Design & Analysis and Hazard Assessment

Design and Analysis

- OPG should provide a documented rationale that supports its claim that the BWRX-300 is not fundamentally different from reactor designs previously considered to strengthen both reports.
- The EIS Review Report should identify where the BWRX-300 design has not progressed, or where it might yet change significantly enough to impact the EIS Review Report's conclusions.
- OPG should provide more detailed documentation describing how it intends to ensure the BWRX-300 will meet the requirement for two separate, independent, and diverse means of reactor shutdown.

Hazard Assessment

- OPG should provide improved clarity regarding why the BWRX-300 is assumed to have a smaller exclusion zone.
- OPG should provide a comparison of the risks associated with various designs to place the hazard assessment in better context.
- OPG should include an assessment of the potential hazards that may come with the co-location of nuclear reactors at the same facility to enhance the hazard assessment provided.
- OPG should resubmit its hazard assessment to include the scenario of a large military aircraft accident which includes an assessment of malevolent drone use, and large commercial aircraft collisions.

Overall, participants were interested in understanding whether the BWRX-300 design has evolved enough for the CNSC to sufficiently draw conclusions at this time. It was suggested that the aspects of the BWRX-300 design that are still in development be clearly documented and made publicly available.

Releases, Doses and Emergency Management

Releases & Doses

- OPG should provide publicly available documents on releases of radioactive iodine and a description of how these releases remain within the bounds of the previously approved environmental assessment.
- OPG should clarify how the proportions of radionuclides in gaseous effluents, liquid effluents, and solid waste have changed from the original EIS.
- CNSC should improve its communication regarding how the limits to effluent release levels are determined and regulated.

Emergency Management

- OPG should provide more information on its emergency management plan and how emergency planning for BWRX-300 deployment will encompass a larger range of the population in the event of a severe nuclear incident.
- OPG should consider effects of a severe core damage accident at an operating unit on safety of personnel engaged in construction of the new reactor(s) and this information should be reflected in OPG's emergency planning assessment.
- CNSC should publish the 2019 Technical Study Report of the Provincial Nuclear Emergency Response Plan (PNERP) on the Open Government Portal.

Conclusion

Participants expressed interest in future workshops as OPG's licence to construct application moves through the regulatory review process. CNSC staff will continue to work with Indigenous Nations and communities, civil societies, NGOs and the public to assess the effectiveness of the workshop and the format of any potential future workshops. These workshops will continue to enhance the CNSC's understanding of the concerns and interests of participants with respect to CNSC staff's technical review of OPG's request to construct one BWRX-300. CNSC staff wish to thank all participants for their meaningful contributions prior to and during the workshop and look forward to future engagement opportunities.

Next Steps

The CNSC is exploring how to further improve transparency of information and how it can be accessed. CNSC is enhancing document accessibility by linking the original environmental assessment archive to the Open Government portal and directing readers to the [Open Government Portal](#) webpage. CNSC is continuing to evaluate options to make information readily available on intuitive platforms. This includes encouraging OPG to post their EIS Review supporting documentation. CNSC staff will continue to provide updates on the project through the DNNP website and will follow-up with workshop participants, Indigenous Nations and communities, the public and stakeholders to discuss their concerns.

Since the workshop, the PENRP has been made available [online](#).

The list below describes an evergreen multi-year schedule of planned CNSC engagement events on this project, as requested by workshop participants.

ACTIVITY	DATE
CNSC Open House in the Municipality of Clarington which will showcase all nuclear projects in the area	September 26 th , 2023
Public webinars which will provide an overview of OPG's hearing submission and CNSC staff's recommendations to be considered at the hearing in January 2024	November, 2023
Requests to intervene in Hearing # 1 are due and filed with the Commission Registry	November 20 th , 2023
OPG's DNNP Hearing #1	Week of January 22 nd , 2024

Public webinar or workshop: Update on DNNP and Hearing #2	May/June 2024. This event is tentative and will be dependent on the Commission's decision on Hearing #1.
Public webinar which will provide an update on DNNP Hearing #2	September 2024. This event is tentative and will be dependent on the Commission's decision on Hearing #1.

Dates and events are subject to change to align with any changes in the DNNP schedule. More information on the public hearings and participant funding for this project can be found in the [Notice of Hearing](#), published on April 3, 2023.

ANNEX A: Commitments

Table 1 – Status of Joint Review Panel Recommendations

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
1	<p>The Panel understands that prior to construction, the Canadian Nuclear Safety Commission will determine whether this environmental assessment is applicable to the reactor technology selected by the Government of Ontario for the Project. Nevertheless, if the selected reactor technology is fundamentally different from the specific reactor technologies bounded by the Plant Parameter Envelope, the Panel recommends that a new environmental assessment be conducted.</p>	<p>The Government of Canada accepts the intent of this recommendation but acknowledges that any RA under the CEAA will need to determine whether the future proposal by the proponent is fundamentally different from the specific reactor technologies assessed by the JRP and if a new EA is required under the CEAA.</p>	N/A	Initiated

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
2	The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission require OPG to conduct a comprehensive soils characterization program. In particular, the potentially impacted soils in the areas OPG identifies as the spoils disposal area, cement plant area and asphalt storage area must be sampled to identify the nature and extent of potential contamination.	The Government of Canada accepts the recommendation to require OPG to conduct a comprehensive soils characterization program. The Government of Canada also notes that the recommended soils characterization program could also support future ecological risk assessment activities by OPG. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.	D-P-3.6	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
3	<p>The Panel recommends that the Canadian Nuclear Safety Commission require that as part of the Application for a Licence to Construct a reactor, OPG must undertake a formal quantitative cost-benefit analysis for cooling tower and once-through condenser cooling water systems, applying the principle of best available technology economically achievable. This analysis must take into account the fact that lake infill should not go beyond the two-metre depth contour and</p>	<p>The Government of Canada accepts the intent of this recommendation to require OPG to conduct a formal quantitative cost-benefit analysis for cooling tower and once-through condenser cooling water systems, as recommended, but acknowledges that this analysis may be required earlier than indicated in the recommendation given the relationship between site layout and the choice of condenser cooling technology. Fisheries and Oceans Canada and Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon</p>	D-C-1.1	Complete

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	should include cooling tower plume abatement technology.	request, to assist in the implementation of this recommendation. The Government of Canada further acknowledges the connection of this Recommendation with Panel Recommendation #31 and as such notes that Fisheries and Oceans Canada will work with OPG to ensure through its regulatory process and conditions of authorization under the Fisheries Act that any Harmful Alteration, Disruption and Destruction (HADD) is limited to the 2 metre depth contour of Lake Ontario.		
4	The Panel recommends that the Canadian	The Government of Canada accepts this recommendation,	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Nuclear Safety Commission exercise regulatory oversight to ensure that OPG complies with all municipal and provincial requirements and standards over the life of the Project. This is of particular importance because the conclusions of the Panel are based on the assumption that OPG will follow applicable laws and regulations at all jurisdictional levels.	however, recognizes that it is the responsibility of provincial and municipal officials to ensure compliance with their own requirements and standards over the life of the Project.		
5	To avoid any unnecessary environmental damage to the bluff at Raby Head and fish habitat, the Panel recommends that no bluff	The Government of Canada accepts this recommendation to avoid any unnecessary environmental damage to the bluff at Raby Head and fish habitat as	D-P-14.1	Open
			D-P-16.1	Open
			D-P-3.8	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	removal or lake infill occur during the site preparation stage, unless a reactor technology has been selected and there is certainty that the Project will proceed.	recommended. Fisheries and Oceans Canada and Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. The Government of Canada further notes that authorization under the Fisheries Act will be required prior to any lake infill taking place, and confirms that Fisheries and Oceans Canada will work with OPG to ensure that as a condition of that authorization, that no lake infill occurs unless there is certainty that the Project will proceed and		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		appropriate mitigation measures and habitat compensation have been implemented.		
6	The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission require OPG to update its preliminary decommissioning plan for site preparation in accordance with the requirements of Canadian Standards Association (CSA) Standard N294-09. The OPG preliminary decommissioning plan for site preparation must incorporate the rehabilitation of the site to reflect the existing biodiversity in	The Government of Canada accepts the intent of the recommendation to require OPG to maintain a preliminary decommissioning plan for site preparation in accordance with the requirements of CSA Standard N294-09, which provides direction on the decommissioning of licensed facilities and activities consistent with Canadian and international recommendations. The Government of Canada accepts the recommendation to require OPG to	D-P-13.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>the event that the Project does not proceed beyond the site preparation phase. OPG shall prepare a detailed preliminary decommissioning plan once a reactor technology is chosen, to be updated as required by the Canadian Nuclear Safety Commission.</p>	<p>revise the preliminary decommissioning plan once a reactor technology is selected.</p>		
7	<p>The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission require that OPG establish a decommissioning financial guarantee to be reviewed as required by the Canadian Nuclear Safety</p>	<p>The Government of Canada accepts the intent of this recommendation to require OPG to establish a financial guarantee for the site preparation stage, however, notes that the financial guarantee must be sufficient to cover the cost of decommissioning</p>	D-P-13.2	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Commission. Regarding the decommissioning financial guarantee for the site preparation stage, the Panel recommends that this financial guarantee contain sufficient funds for the rehabilitation of the site in the event the Project does not proceed beyond the site preparation stage.	work outlined in the preliminary decommissioning plan referenced in Recommendation #6.		
8	The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission require OPG to develop a follow-up and adaptive management program for air contaminants such as Acrolein,	The Government of Canada accepts this recommendation to require OPG to develop a follow-up and adaptive management program for air contaminants and a smog alert action plan. Health Canada and Environment Canada can	D-P-12.2	Closed
			D-P-3.10	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>NO₂, SO₂, SPM, PM_{2.5} and PM₁₀, to the satisfaction of the Canadian Nuclear Safety Commission, Health Canada and Environment Canada. Additionally, the Canadian Nuclear Safety Commission must require OPG to develop an action plan acceptable to Health Canada for days when there are air quality or smog alerts.</p>	<p>provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, to assist in the implementation of this recommendation.</p>		
9	<p>The Panel recommends that the Canadian Nuclear Safety Commission, in collaboration with Health Canada, require OPG to develop and implement a detailed acoustic assessment for</p>	<p>The Government of Canada accepts this recommendation to require OPG to develop and implement a detailed acoustic assessment. Health Canada can provide available scientific and technical expertise</p>	D-P-3.2	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	all scenarios evaluated. The predictions must be shared with potentially affected members of the public. The OPG Nuisance Effects Management Plan must include noise monitoring, a noise complaint response mechanism and best practices for activities that may occur outside of municipal noise curfew hours to reduce annoyance that the public may experience.	to the Canadian Nuclear Safety Commission, to assist in the implementation of this recommendation.		
10	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to undertake a detailed site geotechnical	The Government of Canada accepts the intent of this recommendation to require OPG to undertake a detailed site geotechnical investigation, however, notes	D-P-9.1	Closed
			D-P-9.2	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>investigation prior to commencing site preparation activities. The geologic elements of this investigation should include, but not be limited to:</p> <p>collection of site-wide information on soil physical properties;</p> <p>determining the mechanical and dynamic properties of overburden material across the site;</p> <p>mapping of geological structures to improve the understanding of the site geological structure model;</p> <p>confirming the lack of karstic features in the</p>	<p>that this investigation may be performed concurrently with site preparation activities. Natural Resources Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	local bedrock at the site; and confirming the conclusions reached concerning the liquefaction potential in underlying granular materials.			
1 1	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to develop and implement a follow-up program for soil quality during all stages of the Project.	The Government of Canada accepts this recommendation to require OPG to develop and implement a follow-up program for soil quality. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.	D-P-12.6	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
1 2	The Panel recommends that before in-water works are initiated, the Canadian Nuclear Safety Commission require OPG to collect water and sediment quality data for any future embayment area that may be formed as a consequence of shoreline modifications in the vicinity of the outlet of Darlington Creek. This data should serve as the reference information for the proponent's post-construction commitment to conduct water and sediment quality monitoring of the embayment area.	The Government of Canada accepts this recommendation to require OPG to collect water and sediment quality data for any future embayment area. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. The Government of Canada notes that authorization under the Fisheries Act will be required prior to in-water works. Prior to the issuance of an authorization, Fisheries and	D-P-12.3	Open

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
		Oceans Canada will require a water and sediment quality monitoring program. This program is required to assess whether OPG continues to meet the intent of section 36 of the Fisheries Act.			
13	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to collect and assess water quality data for a comprehensive number of shoreline and offshore locations in the site study area prior to commencing in-water works. This data should be used to establish a reference for follow-up monitoring.	The Government of Canada accepts the intent of this recommendation to require OPG to collect and assess water quality data for a comprehensive number of shoreline and offshore locations in the site study area prior to commencing in-water works and would further support the collection of sediment quality data as part of a comprehensive program. Environment	D-P-12.3		Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		<p>Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. The Government of Canada notes that authorization under the Fisheries Act will be required prior to in-water works. Prior to the issuance of an authorization, Fisheries and Oceans Canada will require a water and sediment quality monitoring program. This program is required to assess whether OPG continues to meet the intent of</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		section 36 of the Fisheries Act.		
1 4	The Panel recommends that following the selection of a reactor technology for the Project, the Canadian Nuclear Safety Commission require OPG to conduct a detailed assessment of predicted effluent releases from the Project. The assessment should include but not be limited to effluent quantity, concentration, points of release and a description	The Government of Canada accepts this recommendation to require OPG to conduct a detailed assessment of predicted effluent releases from the Project, as recommended. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of	D-C-2.1	Open
			D-C-4.1	Open
			D-P-12.9	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>of effluent treatment, including demonstration that the chosen option has been designed to achieve best available treatment technology and techniques economically achievable. The Canadian Nuclear Safety Commission shall also require OPG to conduct a risk assessment on the proposed residual releases to determine whether additional mitigation measures may be necessary.</p>	<p>this recommendation.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
15	<p>The Panel recommends that following the start of operation of the reactors, the Canadian Nuclear Safety Commission require OPG to conduct monitoring of ambient water and sediment quality in the receiving waters to ensure that effects from effluent discharges are consistent with predictions made in the environmental impact statement and with those made during the detailed design phase.</p>	<p>The Government of Canada accepts this recommendation to require OPG to conduct monitoring of ambient water and sediment quality in the receiving waters as recommended. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. The Government of Canada notes that authorization under the Fisheries Act will be required prior to in-water works. Prior to the</p>	D-P-12.3	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		issuance of an authorization, Fisheries and Oceans Canada will require a water and sediment quality monitoring program. This program is required to assess whether OPG continues to meet the intent of section 36 of the Fisheries Act.		
1 6	The Panel recommends that prior to the start of construction, the Canadian Nuclear Safety Commission require the proponent to establish toxicity testing criteria and provide the test methodology and test frequency that will be used to confirm that stormwater discharges from	The Government of Canada accepts the intent of this recommendation to require the proponent to establish toxicity testing criteria and provide the test methodology and test frequency for stormwater. The Government of Canada would additionally support the application of this recommended testing for process effluents. Environment	D-C-2.1 D-P-3.4	Open Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	the new nuclear site comply with requirements in the Fisheries Act.	Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
17	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to provide an assessment of the ingress and transport of contaminants in groundwater on site during successive phases of the Project as part of the Application for a Licence to Construct. This assessment shall include consideration of the impact of	The Government of Canada accepts this recommendation to require OPG to provide an assessment of the ingress and transport of contaminants in groundwater on site during successive phases of the Project as recommended. For clarity, the Government of Canada would support enhanced groundwater and contaminant transport modelling extending to	D-C-2.1 D-C-4.1 D-C-5.1 D-C-6.1 D-P-12.6	Open Open Open Open Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	wet and dry deposition of all contaminants of potential concern and gaseous emissions on groundwater quality. OPG shall conduct enhanced groundwater and contaminant transport modelling for the assessment and expand the modelling to cover the effects of future dewatering and expansion activities at the St. Marys Cement quarry on the Project.	appropriate model boundaries, which may not necessarily be site boundaries. Natural Resources Canada and Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
18	The Panel recommends that based on the groundwater and contaminant transport modelling results, the Canadian Nuclear Safety	The Government of Canada accepts this recommendation to require OPG to update the Radiological Environmental Monitoring Program, based on	D-C-6.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Commission require OPG to expand the Radiological Environmental Monitoring Program. This program shall include relevant residential and private groundwater well quality data in the local study area that are not captured by the current program, especially where the modelling results identify potential critical groups based on current or future potential use of groundwater.	the groundwater and contaminant transport modelling results. Natural Resources Canada and Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
19	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to expand the scope of the groundwater monitoring	The Government of Canada accepts this recommendation to require OPG to expand the scope of the groundwater monitoring program to monitor	D-P-12.6	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>program to monitor transitions in groundwater flows that may arise as a consequence of grade changes during the site preparation and construction phases of the Project. The design of the grade changes should guide the determination of the required monitoring locations, frequency of monitoring and the required duration of the program for the period of transition to stable conditions following the completion of construction and the initial period of operation.</p>	<p>transitions in groundwater flows that may arise as a consequence of grade changes during the site preparation and construction phases of the Project. Natural Resources Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		
20	<p>The Panel recommends that the</p>	<p>The Government of Canada accepts this</p>	D-P-14.1	Open
			D-P-3.7	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>Canadian Nuclear Safety Commission require OPG to perform a thorough evaluation of site layout opportunities before site preparation activities begin, in order to minimize the overall effects on the terrestrial and aquatic environments and maximize the opportunity for quality terrestrial habitat rehabilitation.</p>	<p>recommendation to require OPG to perform a thorough evaluation of site layout opportunities before site preparation activities begin, as recommended. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. As part of the conditions of authorization under the Fisheries Act, Fisheries and Oceans Canada also commits to working with OPG to ensure overall impacts to aquatic</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		habitat are minimized with appropriate mitigation and habitat compensation.		
2 1	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to compensate for the loss of ponds, like-for-like, preferably in the site study area. The Panel also recommends that the Canadian Nuclear Safety Commission require OPG to use best management practices to prevent or minimize the potential runoff of sediment and other contaminants into wildlife	The Government of Canada accepts the recommendation to require OPG to use best management practices to prevent or minimize the potential runoff of sediment and other contaminants. The Government of Canada accepts the intent of compensating for the loss of ponds but would also support the Canadian Nuclear Safety Commission requiring OPG to design compensation ponds that maximize ecological	D-P-3.7	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	habitat associated with Coot's Pond during site preparation and construction phases.	function, and not necessarily limited to "like-for-like". Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
2 2	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to develop a follow-up program for insects, amphibians and reptiles, and mammal species and communities to ensure that proposed mitigation measures are effective.	The Government of Canada accepts the intent of this recommendation to require OPG to develop a follow-up program for insects, amphibians and reptiles, and mammal species and communities as appropriate, and would support a focus for this follow-up program on species at risk and the use of this follow-up program to verify the	D-P-12.5	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		<p>conclusions of the Ecological Risk Assessment. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		
2 3	<p>The Panel recommends that Environment Canada collaborate with OPG to develop and implement a follow-up program to confirm the effectiveness of OPG's proposed mitigation measures for bird communities should natural draft cooling towers be chosen for the</p>	<p>The Government of Canada accepts the intent of this recommendation to collaborate with OPG to develop such a follow-up program for bird communities and would further support the consideration of potential impacts from habitat disturbance, as well as from bird collision impacts, in the scope of that program. The Government of</p>	D-P-12.5	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	condenser cooling system.	Canada acknowledges that the Canadian Nuclear Safety Commission has the statutory authority and powers to ensure such a follow-up program is implemented through future licensing under the Nuclear Safety and Control Act. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
2 4	The Panel recommends that during the site preparation stage, Environment Canada shall ensure that OPG not undertake habitat destruction or disruption between the period of May 1 and July 31 of any year to minimize effects to breeding migratory birds.	The Government of Canada accepts the intent of this recommendation to avoid habitat destruction or disruption between the period of May 1 and July 31 of any year to protect most bird species' nesting activities. However, Environment Canada does not have the ability to ensure that OPG conducts all of its land clearing activities when migratory bird nests are not active since the department does not have a regulatory permitting ability to bind the proponent. The Government of Canada acknowledges that the Canadian Nuclear Safety Commission has	D-P-3.7	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		the statutory authority and powers to address this recommendation through future licensing under the Nuclear Safety and Control Act. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
25	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to conduct more sampling to confirm the presence of Least Bittern before site preparation	The Government of Canada accepts this recommendation to require OPG to conduct more sampling to confirm the presence of Least Bittern and to develop and implement a management plan for species at risk,	D-P-12.5	Closed
			D-P-3.7	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	activities begin. The Panel recommends that the Canadian Nuclear Safety Commission require OPG to develop and implement a management plan for the species at risk that are known to occur on site. The plan should consider the resilience of some of the species and the possibility of off-site compensation.	as may be appropriate. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
26	The Panel recommends that the Canadian Nuclear Safety Commission require OPG to develop a comprehensive assessment of hazardous substance releases and the required management practices for	The Government of Canada accepts this recommendation to require OPG to develop a comprehensive assessment of hazardous substance releases and the required management practices for hazardous chemicals on site once a	D-C-2.1 D-C-5.1 D-P-12.9 D-P-3.6	Open Open Open Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	hazardous chemicals on site, in accordance with the Canadian Environmental Protection Act, once a reactor technology has been chosen.	reactor technology has been chosen. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.		
27	The Panel recommends that prior to any destruction of the Bank Swallow habitat, the Canadian Nuclear Safety Commission require OPG to implement all of its proposed Bank Swallow mitigation options, including: the acquisition of off-site nesting habitat; the construction of artificial Bank Swallow nest	The Government of Canada accepts the intent of this recommendation to require OPG to implement the identified Bank Swallow mitigation measures using an adaptive management approach and would support determining required mitigation based on reasonable estimates of actual burrow loss. The Government of Canada expects that the acquisition of	D-P-3.8	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>habitat with the capacity to maintain a population which is at least equal to the number of breeding pairs currently supported by the bluff and as close to the original bluff site as possible; and</p> <p>the implementation of an adaptive management approach in the Bank Swallow mitigation plan, with the inclusion of a threshold of loss to be established in consultation with all stakeholders before any habitat destruction takes place.</p>	<p>offsite nesting habitat should only be necessary if follow-up monitoring shows that onsite mitigation is unsuccessful, and notes that onsite mitigation may also include the enhancement of potential natural nesting sites within the Site Study Area. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		
			D-P-12.4	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
28	<p>The Panel recommends that Fisheries and Oceans Canada require OPG to continue conducting adult fish community surveys in the site study area and reference locations on an ongoing basis. These surveys shall be used to confirm that the results of 2009 gillnetting and 1998 shoreline electrofishing reported by OPG, and the additional data collected in 2010 and 2011, are representative of existing conditions, taking into account natural year-to-year variability. Specific attention should be paid to baseline</p>	<p>The Government of Canada accepts this recommendation. Fisheries and Oceans Canada will work with Environment Canada, the Canadian Nuclear Safety Commission, the Ontario Ministry of Natural Resources and OPG to develop the details of an ongoing fisheries monitoring program which will be included as a condition of a Fisheries Act authorization.</p>	D-P-15.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	gillnetting monitoring in spring to verify the findings on fish spatial distribution and relatively high native fish species abundance in the embayment area, such as white sucker and round whitefish. The shoreline electrofishing habitat use study is needed to establish the contemporary baseline for later use to test for effects of lake infill armouring, if employed, and the effectiveness of mitigation.			
29	The Panel recommends that Fisheries and Oceans Canada require OPG to continue the research element of the proposed Round	The Government of Canada accepts this recommendation. Fisheries and Oceans Canada will work with Environment Canada, Canadian	D-P-12.4	Open
			D-P-15.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Whitefish Action Plan for the specific purpose of better defining the baseline condition, including the population structure, genome and geographic distribution of the round whitefish population as a basis from which to develop testable predictions of effects, including cumulative effects.	Nuclear Safety Commission, Ontario Ministry of Natural Resources and OPG to develop and finalize the Round Whitefish Action Plan. This plan, as a condition of a Fisheries Act authorization, will form part of the ongoing monitoring program and feed into an adaptive management plan to protect the round whitefish population into the future.		
30	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to the construction of in-water structures, Fisheries and	The Government of Canada accepts this recommendation. Fisheries and Oceans Canada will work with the Canadian Nuclear Safety Commission, and the Ontario Ministry of Natural Resources to	D-C-1.2	Closed
			D-P-12.4	Open
			D-P-15.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>Oceans Canada require OPG to conduct:</p> <p>additional impingement sampling at the existing Darlington Nuclear Generating Station to verify the 2007 results and deal with inter-year fish abundance variability and sample design inadequacies; and</p> <p>additional entrainment sampling at the existing Darlington Nuclear Generating Station to better establish the current conditions. The program should be designed to guard against a detection limit bias by including in the analysis of</p>	<p>develop an impingement and entrainment sampling program. The Government of Canada would also like to note that authorization under the Fisheries Act will be required prior to any lake infill taking place and commits that Fisheries and Oceans Canada will work with OPG to ensure that the impingement and entrainment sampling program is developed and implemented as a condition of that authorization.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>entrainment losses those fish species whose larvae and eggs are captured in larval tow surveys for the seasonal period of the year in which they occur. A statistical optimization analysis will be needed to determine if there is a cost-effective entrainment survey design for round whitefish larvae.</p>			
31	<p>Irrespective of the condenser cooling system chosen for the Project, the Panel recommends that Fisheries and Oceans Canada not permit OPG to infill beyond the two-metre depth</p>	<p>The Government of Canada accepts the intent of this recommendation. Fisheries and Oceans Canada will work with OPG to ensure that the HADD of fish habitat associated with the proposed lake infill is limited to the area within the two-metre</p>	<p>D-C-1.1 D-P-14.1 D-P-16.1</p>	<p>Closed Open Open</p>

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	contour in Lake Ontario.	depth contour of Lake Ontario. The extent of the HADD as well as appropriate mitigation and habitat compensation will be included in the conditions of authorization under the Fisheries Act.		
3 2	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that Fisheries and Oceans Canada require OPG to mitigate the risk of adverse effects from operation, including impingement, entrainment and thermal excursions and plumes, by locating the system intake	The Government of Canada accepts this recommendation. Fisheries and Oceans Canada will work with Environment Canada and the Canadian Nuclear Safety Commission to determine the appropriate location for the intake and diffuser structures, and to evaluate other mitigation options for both the intake and the diffuser structures, in order to mitigate	D-C-1.2	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	and diffuser structures in water beyond the nearshore habitat zone. Furthermore, OPG must evaluate other mitigative technologies for the system intake, such as live fish return systems and acoustic deterrents.	adverse effects. Fisheries and Oceans Canada will work with OPG to ensure implementation through its regulatory process and conditions of authorization under the Fisheries Act.		
33	The Panel recommends that Fisheries and Oceans Canada require OPG to conduct an impingement and entrainment follow-up program at the existing Darlington Nuclear Generating Station and the Project site to confirm the prediction of adverse effects, including	The Government of Canada accepts this recommendation. Fisheries and Oceans Canada will work with the Canadian Nuclear Safety Commission and Ontario Power Generation to develop an impingement and entrainment study on the existing Darlington Nuclear Generating Station and at the proposed Project	D-P-12.4	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	cumulative effects, and the effectiveness of mitigation. For future entrainment sampling for round whitefish, a statistical probability analysis will be needed to determine if unbiased and precise sample results can be produced.	site to confirm predicted adverse effects and will further ensure implementation through its regulatory process and conditions of authorization under the Fisheries Act.		
3 4	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to construction, Environment Canada ensure that enhanced resolution thermal plume modeling is conducted by OPG, taking into account possible	The Government of Canada accepts the intent of this recommendation. Environment Canada is committed to reviewing the information provided by OPG, and will rely on Fisheries and Oceans Canada authorization for a HADD associated with the intake or outfall to ensure that OPG undertakes this	D-C-1.2	Closed
			D-P-12.4	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	future climate change effects. Fisheries and Oceans Canada shall ensure that the results of the modeling are incorporated into the design of the outfall diffuser and the evaluation of alternative locations for the placement of the intake and the diffuser of the proposed condenser cooling water system.	modelling. Fisheries and Oceans Canada will work with Environment Canada, and the Canadian Nuclear Safety Commission to incorporate the results from the thermal plume modeling into the determination of the appropriate location for the intake and diffuser structures to mitigate adverse effects. Fisheries and Oceans Canada will ensure implementation through conditions of a Fisheries Act authorization.		
35	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to	The Government of Canada accepts this recommendation to require OPG to update a comprehensive surface water risk assessment as	D-C-1.2	Closed
D-P-12.3			Open	
D-P-12.4			Open	

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>operation, the Canadian Nuclear Safety Commission require OPG to include the following in the surface water risk assessment:</p> <p>the surface combined thermal and contaminant plume; and</p> <p>the physical displacement effect of altered lake currents as a hazardous pulse exposure to fish species whose larvae passively drift through the area, such as lake herring, lake whitefish, emerald shiner and yellow perch.</p> <p>If the risk assessment result predicts a potential hazard, then the Canadian</p>	<p>recommended, however would clarify that an assessment of the combined thermal and contaminant plume should consider not only the surface area of the plume, but its vertical extent as well. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the design of the surface water risk assessment and any subsequent action plan development.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Nuclear Safety Commission shall convene a follow-up monitoring scoping workshop with Environment Canada, Fisheries and Oceans Canada and any other relevant authorities to develop an action plan.			
36	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that during operation, the Canadian Nuclear Safety Commission require OPG to undertake adult fish monitoring of large-bodied and small-bodied fish to confirm the effectiveness of	The Government of Canada accepts this recommendation to require OPG to undertake adult fish monitoring to confirm the effectiveness of mitigation measures and effect predictions. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear	D-C-1.2 D-P-12.4	Closed Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	mitigation measures and verify the predictions of no adverse thermal and physical diffuser jet effects.	Safety Commission, upon request, to assist in the implementation of this recommendation. Fisheries and Oceans Canada is committed to working with OPG to develop their fish and fish habitat monitoring and follow-up program and ensuring implementation through conditions of authorization under the Fisheries Act.		
37	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to construction, the Canadian Nuclear Safety Commission	The Government of Canada accepts the intent of this recommendation to require OPG to determine the total area of permanent aquatic effects from identified impacts. The Government of Canada would further support	D-C-1.2	Closed
			D-P-12.4	Open

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
	<p>require OPG to determine the total area of permanent aquatic effects from the following, to properly scale mitigation and scope follow-up monitoring:</p> <p>§ the thermal plume + 2°C above ambient temperature;</p> <p>§ the mixing zone and surface plume contaminants;</p> <p>physical displacements from altered lake currents; and</p> <p>infill and construction losses and modifications.</p>	<p>inclusion of cumulative effects assessment in this assessment, including the effects of impingement and entrainment and climate change. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. Further, Fisheries and Oceans Canada is committed to working with the Canadian Nuclear Safety Commission and OPG to ensure that any permanent aquatic habitat effects are</p>			

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		mitigated, and appropriate habitat compensation is developed and implemented as a condition of any Fisheries Act authorization.		
38	The Panel recommends that the Canadian Nuclear Safety Commission require that the geotechnical and seismic hazard elements of the detailed site geotechnical investigation to be performed by OPG include, but not be limited to: Prior to site preparation: demonstration that there are no undesirable subsurface conditions at the Project site. The overall site liquefaction	The Government of Canada accepts the intent of this recommendation to require OPG's detailed site investigation to include the noted geotechnical and seismic hazard elements, however, notes that this investigation may be performed concurrently with site preparation activities. Natural Resources Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist	D-O-3.1	Open
			D-P-9.1	Closed
			D-P-9.3	Open
			D-P-9.4	Open
			D-P-9.5	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>potential shall be assessed with the site investigation data; and</p> <p>confirmation of the absence of paleoseismologic features at the site and, if present, further assessment to reduce the overall uncertainty in the seismic hazard assessment during the design of the Project must be conducted.</p> <p>During site preparation and/or prior to construction:</p> <p>verification and confirmation of the absence of surface faulting in the overburden and bedrock at the site.</p>	<p>in the implementation of this recommendation.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>Prior to construction:</p> <p>verification of the stability of the cut slopes and dyke slopes under both static and dynamic loads with site/Project-specific data during the design of the cut slopes and dykes or before their construction;</p> <p>assessment of potential liquefaction of the northeast waste stockpile by using the data obtained from the pile itself upon completion of site preparation;</p> <p>measurement of the shear strength of the overburden materials and the dynamic properties of</p>			

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>both overburden and sedimentary rocks to confirm the site conditions and to perform soil-structure interaction analysis if necessary;</p> <p>assessment of the potential settlement in the quaternary deposits due to the groundwater drawdown caused by future St. Marys Cement quarry activities; and</p> <p>assessment of the effect of the potential settlement on buried infrastructures in the deposits during the design of these infrastructures.</p> <p>Prior to operation:</p>			

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	development and implementation of a monitoring program for the Phase 4 St. Marys Cement blasting operations to confirm that the maximum peak ground velocity at the boundary between the Darlington and St. Marys Cement properties is below the proposed limit of three millimetres per second (mm/s).			
39	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to prepare a contingency plan for the construction,	The Government of Canada accepts this recommendation to require OPG to prepare a contingency plan to account for uncertainties associated with flooding, drought and other extreme	D-C-7.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>operation and decommissioning Project stages to account for uncertainties associated with flooding and other extreme weather hazards. OPG shall conduct localized climate change modelling to confirm its conclusion of a low impact of climate change. A margin/bound of changes to key parameters, such as intensity of extreme weather events, needs to be established to the satisfaction of the Canadian Nuclear Safety Commission. These parameters can be incorporated into hydrological designs leading up to an application to</p>	<p>weather hazards, as recommended. The Government of Canada accepts the intent of the recommendation to conduct localized climate change modelling; however, if OPG uses reputable published studies to evaluate the anticipated impact of climate change for the Project area, localized climate change modelling may not be necessary. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	construct a reactor, as well as measures for flood protection. OPG must also conduct a drought analysis and incorporate any additional required mitigation/design modifications, to the satisfaction of the Canadian Nuclear Safety Commission, as part of a Licence to Construct a reactor.			
40	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to: establish an adaptive management program for algal hazard to the Project cooling water	The Government of Canada accepts this recommendation to require OPG to establish an adaptive management program for algal hazards to the cooling water system intake and factor that assessment into planned siting studies and cost-	D-C-1.2 D-P-12.4	Closed Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>system intake that includes the setup of thresholds for further actions; and</p> <p>factor the algal hazard assessment into a more detailed biological evaluation of moving the intake and diffuser deeper offshore as part of the detailed siting studies and the cost-benefit analysis of the cooling system.</p>	<p>benefit analyses. Fisheries and Oceans Canada and Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.</p>		
41	<p>The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission coordinate discussions with OPG and key stakeholders on the effects of the Project on</p>	<p>The Government of Canada accepts the intent of this recommendation for the CNSC to initiate discussions with OPG and key stakeholders, however, notes that these discussions may occur concurrently with site</p>	D-P-17.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	housing supply and demand, community recreational facilities and programs, services and infrastructure as well as additional measures to help deal with the pressures on these community assets.	preparation activities.		
4 2	The Panel recommends that on an ongoing basis, OPG pursue its strategy to ensure that Aboriginal students can benefit from the permanent job opportunities that will be available during the lifetime of the Project. In this regard, OPG should collaborate with various secondary and post-secondary	The Government of Canada supports this proposal and notes that such programs are consistent with OPG's presentation to the Panel on Aboriginal Interests on March 28, 2011, and with OPG's Aboriginal Relations Policy.	D-P-17.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	education institutions as well as Aboriginal groups to ensure that such programs would be successful.			
43	The Panel recommends that the Canadian Nuclear Safety Commission engage appropriate stakeholders, including OPG, Emergency Management Ontario, municipal governments and the Government of Ontario to develop a policy for land use around nuclear generating stations.	The Government of Canada accepts this recommendation for the Canadian Nuclear Safety Commission to engage appropriate stakeholders in developing policy for land use around nuclear generating stations.	D-P-17.1	Closed
44	The Panel recommends that the Government of	This recommendation was directed to	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Ontario take appropriate measures to prevent sensitive and residential development within three kilometres of the site boundary.	the Government of Ontario.		
4 5	The Panel recommends that the Municipality of Clarington prevent, for the lifetime of the nuclear facility, the establishment of sensitive public facilities such as school, hospitals and residences for vulnerable clientele within the three-kilometre zone around the site boundary.	This recommendation was directed to the Municipality of Clarington.	N/A	Complete
4 6	Given that a severe accident may have consequences beyond the three and 10-kilometre	This recommendation was directed to the Government of Ontario.	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	zones evaluated by OPG, the Panel recommends that the Government of Ontario, on an ongoing basis, review the emergency planning zones and the emergency preparedness and response measures, as defined in the Provincial Nuclear Emergency Response Plan (PNERP), to protect human health and safety.			
47	The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission ensure the OPG Traffic Management	The Government of Canada accepts this recommendation to require that OPG's Traffic Management Plan consider elements related to contingency plans, truck traffic,	D-P-10.1	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>Plan addresses the following:</p> <ul style="list-style-type: none"> contingency plans to address the possibility that the assumed road improvements do not occur; consideration of the effect of truck traffic associated with excavated material disposal on traffic operations and safety; further analysis of queuing potential onto Highway 401; and consideration of a wider range of mitigation measures, such as transportation-demand management, transit service provisions and geometric 	<p>queuing potential on Highway 401 and additional mitigation measures.</p>		

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
	improvements at the Highway 401/Waverley Road interchange.				
48	In consideration of public safety, the Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission coordinate a committee of federal, provincial and municipal transport authorities to review the need for road development and modifications.	The Government of Canada accepts the intent of this recommendation to support a federal, provincial and municipal review of the need for road development and modifications, however, notes that this review may be performed concurrently with site preparation activities.	N/A		Not Initiated

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
49	The Panel recommends that prior to construction, Transport Canada ensure that OPG undertake additional quantitative analysis, including collision frequencies and rail crossing exposure indices, and monitor the potential effects and need for mitigation associated with the Project.	The Government of Canada accepts the intent of this recommendation to require OPG to undertake additional rail safety studies, monitor the potential effects and determine the need for mitigation. The Railway Safety Act (RSA) places crossing safety responsibilities on the Railways and the Road Authorities. This policy reflects the objectives of Section 3 of the RSA. Ultimately, the Railway and the Road Authority must take the responsibility of performing the crossing assessment. Transport Canada is committed to provide assistance and expertise to	D-C-3.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		the interested parties if required during the risk assessment and in the evaluation of any proposed mitigation measures.		
50	<p>The Panel recommends that prior to construction, Transport Canada require OPG to conduct a risk assessment, jointly with Canadian National Railway, that includes:</p> <ul style="list-style-type: none"> an assessment of the risks associated with a derailment or other rail incident that could affect the Project; an analysis of the risks associated with a security threat, such as a bomb being placed on a train 	<p>The Government of Canada recognizes that the CNSC has the statutory authority and powers to address this recommendation through future regulatory activities under the Nuclear Safety and Control Act. Transport Canada is committed to provide assistance and expertise to the Canadian Nuclear Safety Commission and other parties if required during the risk assessment and in the evaluation of any proposed mitigation measures.</p>	D-C-3.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	<p>running on the tracks that bisect the Project;</p> <p>a comparative evaluation of the effectiveness of various mitigation measures or combination of measures (e.g., blast wall, retaining wall, recessed tracks, berm and railway speed restrictions within the vicinity of the site);</p> <p>a determination of the design criteria necessary to ensure the effectiveness of these measures (e.g., the appropriate height, strength, material and design of a blast wall); and</p> <p>a critical analysis to confirm that these measures,</p>			

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	when properly designed and implemented, would be sufficient to provide protection to the Project site in the event of a derailment at full speed or other adverse event.			
51	In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to construction, Transport Canada work with OPG to develop a follow-up program to verify the accuracy of the prediction of no significant adverse effects to boating safety from the establishment of	The Government of Canada accepts the intent of this recommendation. Transport Canada will provide guidance and support to OPG to assist in their development of a follow-up program to confirm that boating safety will not be significantly adversely affected. If an adaptive management program is required, Transport Canada can provide support and expertise to OPG	D-P-12.8	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	an increased prohibitive zone. OPG must also develop an adaptive management program, if required, to mitigate potential effects to small watercraft.	in its development.		
5 2	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to make provisions for on-site storage of all used fuel for the duration of the Project, in the event that a suitable off-site solution for the long-term management for used fuel waste is not found.	The Government of Canada accepts the intent of this recommendation to the extent that it is the responsibility of waste owners for managing and funding the safe and secure operation of their own wastes. Canada's 1996 Radioactive Waste Policy Framework states that the owners of radioactive waste are responsible for developing and implementing solutions, including all costs	D-C-9.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		associated with safely and securely managing their wastes.		
53	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to make provisions for on-site storage of all of low and intermediate-level radioactive waste for the duration of the Project, in the event that a suitable off-site solution for the long-term management for this waste is not approved.	The Government of Canada accepts the intent of this recommendation to the extent that it is the responsibility of waste owners for managing and funding the safe and secure operation of their own wastes, in accordance with CNSC's regulatory requirements. Canada's 1996 Radioactive Waste Policy Framework states that the owners of radioactive waste are responsible for developing and implementing solutions, including all costs associated with safely and securely	D-C-9.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		managing their wastes.		
54	The Panel recommends that during operation, the Canadian Nuclear Safety Commission require OPG to implement measures to manage releases from the Project to avoid tritium in drinking water levels exceeding a running annual average of 20 Becquerels per litre at drinking water supply plants in the regional study area.	The Government of Canada accepts the intent of this recommendation to safeguard drinking water; however, it notes that any proposed limits should be consistent with the tritium standards put in place by the relevant regulatory authorities. Health Canada's Guidelines for Canadian Drinking Water Quality, based on the recommendations of the International Commission on Radiological Protection and the World Health Organization, establish a safe consumption	D-C-4.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		<p>guideline limit of 7,000 Bq/L for tritium in drinking water. This limit has been accepted as a standard by the Province of Ontario. Since water quality is primarily a provincial responsibility in Canada, the provinces may adopt federal guidelines, or may establish their own criteria.</p> <p>The Government of Canada further notes that the Canadian Nuclear Safety Commission regulates potential releases of tritium to the environment from nuclear facilities by imposing regulatory limits as well as precautionary action levels for tritium releases into air or water on a licence-</p>		

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
		<p>specific basis. These limits are set with a goal to protect human health. The Canadian Nuclear Safety Commission's Radiation Protection Regulations require that releases are kept "As Low As Reasonably Achievable" (ALARA), social and economic factors taken into account.</p>			
55	<p>The Panel recommends that Health Canada and the Canadian Nuclear Safety Commission continue to participate in international studies seeking to identify long-term health effects of low-level radiation exposures, and</p>	<p>The Government of Canada accepts the recommendation to continue its participation in international studies seeking to identify long-term health effects of low-level radiation exposures. The Government of Canada accepts the intent of the recommendation</p>	N/A		Initiated

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	to identify if there is a need for revision of limits specified in the Radiation Protection Regulations.	to identify if there is a need for revision of limits specified in the Radiation Protection Regulations based on the results of international studies. Health Canada and the Canadian Nuclear Safety Commission will continue to participate in international studies dealing with long-term health effects of low-level radiation exposures; participate in committees/working groups with relevant international organizations; and regularly review the reports published by these international groups for developments in radiation protection. Health Canada can		

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		provide expertise to the Canadian Nuclear Safety Commission, upon request, in support of the review of limits specified in the Radiation Protection Regulations.		
5 6	The Panel recommends that over the life of the Project, the Canadian Nuclear Safety Commission require OPG to conduct ambient air monitoring in the local study area on an ongoing basis to ensure that air quality remains at levels that are not likely to cause adverse effects to human health.	The Government of Canada accepts this recommendation to require OPG to conduct ambient air monitoring to ensure that air quality is not likely to cause adverse effects to human health. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of	D-P-12.2	Closed

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		this recommendation.		
57	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to undertake an assessment of the off-site effects of a severe accident. The assessment should determine if the off-site health and environmental effects considered in this environmental assessment bound the effects that could arise in the case of the selected reactor technology.	The Government of Canada accepts this recommendation to require OPG to undertake an assessment of the off-site effects of a severe accident. Environment Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation.	D-C-3.1	Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
58	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission confirm that dose acceptance criteria specified in RD-337 at the reactor site boundary—in the cases of design basis accidents for the Project's selected reactor technology—will be met.	The Government of Canada accepts this recommendation to ask the Canadian Nuclear Safety Commission to confirm that dose acceptance criteria specified in RD-337 will be met.	D-C-3.1	Open
59	The Panel recommends that the Municipality of Clarington manage development in the vicinity of the Project site to ensure that there is no deterioration in the capacity to evacuate members of the	This recommendation was directed to the Municipality of Clarington.	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	public for the protection of human health and safety.			
60	The Panel recommends that prior to construction, the Government of Canada review the adequacy of the provisions for nuclear liability insurance. This review must include information from OPG and the Region of Durham regarding the likely economic effects of a severe accident at the Darlington Nuclear site where there is a requirement for relocation, restriction of use and remediation of a sector of the regional study area.	The Government of Canada accepts the intent of this recommendation, that the Government of Canada review the adequacy of the provisions for nuclear liability insurance. In bringing forward modernized nuclear civil liability legislation to replace the current Nuclear Liability Act, the Government of Canada will continue to review the adequacy of the provisions for nuclear liability insurance, taking into consideration the risk of Canadian nuclear installations and other relevant factors.	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
61	The Panel recommends that during operation, the Canadian Nuclear Safety Commission require OPG to monitor aquatic habitat and biota for potential cumulative effects from the thermal loading and contaminant plume of the discharge structures of the existing Darlington Nuclear Generating Station and the Project.	The Government of Canada accepts this recommendation to require OPG to monitor aquatic habitat and biota for potential cumulative effects from the thermal loading and contaminant plume. Environment Canada and Fisheries and Oceans Canada can provide available scientific and technical expertise to the Canadian Nuclear Safety Commission, upon request, to assist in the implementation of this recommendation. The proponent will also be required to undertake an aquatic monitoring program as a condition of any	D-P-12.4		Open

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		Fisheries Act authorization.		
62	The Panel recommends that prior to site preparation, Environment Canada evaluate the need for additional air quality monitoring stations in the local study area to monitor cumulative effects on air quality.	The Government of Canada accepts this recommendation to evaluate the need for additional air quality monitoring stations in the local study area to monitor cumulative effects on air quality. If this evaluation finds that additional air quality monitoring stations in the local study area are required, the Government of Canada acknowledges that the Canadian Nuclear Safety Commission has the statutory authority and powers to address	N/A	Complete

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
		the findings of this recommendation through future licensing under the Nuclear Safety and Control Act.			
63	The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to evaluate the cumulative effect of a common-cause severe accident involving all of the nuclear reactors in the site study area to determine if further emergency planning measures are required.	The Government of Canada accepts the intent of this recommendation to require OPG to evaluate the cumulative effect of a common-cause severe accident in the site study area. The Government of Canada notes that the CNSC has established a task force to examine the lessons learned from the Japan Earthquake and will evaluate the operational, technical and regulatory implications of the nuclear event in Japan in relation to Canadian	D-C-3.1		Open

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment Status
		nuclear power plants.		
64	The Panel recommends that the Canadian Environmental Assessment Agency revise the Canadian Environmental Assessment Agency Cumulative Effects Practitioner's Guide to specifically include consideration of accident and malfunction scenarios.	The Government of Canada accepts this recommendation. The Canadian Environmental Assessment Agency is in the process of updating its suite of instruments in support of cumulative effects assessment under the CEAA. An operational policy statement, scheduled for completion by December 2012, will provide core guidance to practitioners and include the consideration of accidents and malfunctions.	N/A	(blank)

#	JRP Recommendation	Government of Canada Response	OPG Reference	Commitment	Status
65	The Panel recommends that the Government of Canada make it a priority to invest in developing solutions for long-term management of used nuclear fuel, including storage, disposal, reprocessing and re-use.	The Government of Canada accepts the intent of this recommendation that priority be given to invest in solutions for the long-term management of used nuclear fuel. It is the responsibility of waste owners to fund and manage the safe and secure operation of their wastes. The Nuclear Waste Management Organization, established by the nuclear energy corporations, is responsible for implementing the government-selected plan for managing nuclear fuel waste over the long-term. The Government of Canada is committed to ensuring that an appropriate and properly funded	N/A		(blank)

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		long-term safe and secure solution is in place for the managing nuclear fuel waste over long term.		
66	The Panel recommends that the Government of Canada update the Nuclear Liability and Compensation Act or its equivalent to reflect the consequences of a nuclear accident. The revisions must address damage from any ionizing radiation and from any initiating event and should be aligned with the polluter pays principle. The revised Nuclear Liability and	The Government of Canada accepts the intent of this recommendation, that the Government of Canada update the Nuclear Liability and Compensation Act or its equivalent to reflect the consequences of a nuclear accident. The Government of Canada recognizes the importance of bringing forward modernized nuclear civil liability legislation to bring compensation in line with internationally accepted levels	N/A	(blank)

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
	Compensation Act, or its equivalent, must be in force before the Project can proceed to the construction phase.	and will decide on the timing of the next introduction of the Nuclear Liability and Compensation Act bill in Parliament.		
67	The Panel recommends that the Government of Canada provide clear and practical direction to the application of sustainability assessment in environmental assessments for future nuclear projects.	The Government of Canada accepts the intent of this recommendation. However, the scope of the assessment and the factors to be considered in future EAs for nuclear projects are decisions that should be taken on a project-by-project basis by future Responsible Authorities. Recognizing that sustainable development is a principle of the Canadian Environmental Assessment Act, should a separate sustainability assessment be	N/A	(blank)

#	JRP Recommendation	Government of Canada Response	OPG Commitment Reference	Status
		<p>required by Responsible Authorities for future nuclear projects, the Government of Canada agrees that it would be desirable for those Responsible Authorities to provide clear and practical direction to proponents and the public on how a sustainability assessment should be conducted.</p>		

ANNEX B: Participant Funding Program Comments (6992421)

Design and Analysis	
<p>General</p> <p>Parameters Analysis</p>	<ul style="list-style-type: none"> • The report has not fully considered the industry guidelines for such a report that were issued by NEI almost one and a half years earlier. It does not address all data suggested by NEI-10-Rev-2. It does not reflect any industry experience; NRC queries or advances in reactor safety expectations that NEI says were reflected in this revision. Some of these questions are quite central to a safe design, many numbered subject headings that were not broached. [LIST TRUNCATED] • NRC expects a clear statement on margin of error on the bounding values chosen. CNSC should too. Certain critical data where margins of error are critically important.

	<ul style="list-style-type: none"> • The effect of a limiting severe core damage accident on the plant parameter envelope was not considered. • When the new entry into the list of potential reactor designs had a parameter that was outside the enveloping limits defined in the earlier incarnation of the PPE, the envelope was extended without any explanation. For example, when the BWRX-300 required to be built onto a depth of 38 meters feet underground and above ground, equivalent to a total structure height of a 25-story building – the PPE was merely re-written to make these parameters acceptable.
<p>Climate Change</p> <p>Means of Shutdown</p>	<ul style="list-style-type: none"> • Additional studies should be conducted on the impacts of an increase in algal blooms due to climate change impacts on Lake Ontario. The modelling for managing aquatic species' interactions with water intake equipment needs to be adapted for the worst-case scenario due to climate change. • OPG should provide updated information on ambient water temperature trends for Lake Ontario and compare that with the allowed range of inlet temperatures for the BWRX-300 reactor design. • OPG must address how it intends to ensure the proposed reactors will meet the requirement for 2 separate, independent and diverse means of reactor shutdown.
<p>Civil Structures</p> <p>General</p>	<ul style="list-style-type: none"> • We would like more information about the construction of the intake and discharge structures offshore, including their size and location in Lake Ontario as well as anticipated environmental effects/mitigations. • What made these parameters no longer important or of interest to OPG? • Did OPG not receive verification that BWRX-300 design is bounded by the PPE? • Does it incorporate all values from the BWRX-300? If not, what values are outstanding? • If GE-Hitachi chose not to participate in the RFP process and the bounding limits for the PPE were designed for the ACR-1000, EPR, and AP-1000, how can the PPE

Parameters Analysis	<p>properly capture the values for the BWRX-300 (made by GE-Hitachi) if they were not part of the RFP process?</p> <ul style="list-style-type: none"> • It is important for the distinctions to be made between the Vendor Design Specific (VDS) parameters and the Reactor Class Specific parameters because the vendor that was chosen did not participate in the design of the PPE and therefore, those parameters that are VDS would not apply? • While it is understood that the values of the composite PPE are presumed to capture the values of the BWRX-300 design, it would be prudent to demonstrate a comparison between the designs that were used to create the PPE and the design technology that was chosen. Where does the BWRX-300 differ? • The BWRX-300 wasn't incorporated into the design of the PPE until the revisions at the very end of the process. This seems contradictory to the purpose of designing a PPE specific for the technology that is selected to be used. • What PPE values were adjusted? Adjusting the parameters is contradictory to the intent of designing the PPE based on reactor designs considered. The BWRX-300 design did not fit within the values used in the PPE or it would not have to be adjusted. • Why is the BWRX-300 not included in this list? How many of the BWRX reactors can be built at the Darlington site? • Why was the decision made to create a new switchyard instead of the original plans to expand the previously existing DNGS switchyard? Does this increase the project footprint? • P.62 speaks to the site water level, measuring the maximum flood and maximum ground water. If the BWRX is below grade 38 metres, how will these parameters change? • P. 61 speaks to earthquakes and the ground acceleration for which the plant is designed. The BWRX was not included in the list of limiting reactors. How will the BWRX design be compromised given that it is deeper below grade than the other reactors?
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Releases	<ul style="list-style-type: none"> • What is a boiling water reactor and whether the water becomes radioactive. • What happens with the spent water and where it is stored. • Are the impact of the water considered in the environmental report.
Climate Change	<ul style="list-style-type: none"> • Item 2.1.4 "Maximum ambient temperature (0% exceedance) is presently cited at 39.0 C. Given the variability of weather patterns and the potential for extreme heat events, has the impact of temperatures above 39.0°C on the system been considered?"
Effluents and Releases	
Monitoring	<ul style="list-style-type: none"> • Need for radiation monitoring equipment that would detect and save data on normal operation effluents as well as radiation fields from accidents.
Source Term Inventory	<ul style="list-style-type: none"> • Iodine emissions from the BWRX-300 will be higher than anticipated in the EIS. Please explain the impacts of higher levels of radioactive iodine emissions in the atmosphere to humans and the environment.
Releases	<ul style="list-style-type: none"> • Table 5 includes a note that "the radionuclides in gaseous effluents, liquid effluents, and solid waste are the same as in the EIS, but their proportions have changed" but there is no reference for a supporting document; it would be useful to have the data on how their proportions have changed. • Section 5.3.6 "Radiation and Radioactivity Environment" also states that "A comparison of emissions from the BWRX-300 reactor and the reactors assessed in the EIS, found that tritium, carbon-14, particulates, and noble gases emissions from the BWRX-300 are less than these emissions for the reactors assessed in the EIS. In contrast, the emissions of iodine are higher for the BWRX-300 than the values assumed in the EIS"; again, no supporting information is provided, and equally troubling is the absence of any discussion of the consequences of higher levels of iodine emissions
Source Term Inventory	<ul style="list-style-type: none"> • In Table 4.1: Airborne Source Term Single Reactor, it appears that the BWRX-300 is projected to release higher quantities of certain individual isotopes when

	<p>compared to other reactors that were previously considered. Notably, a greater amount of radioiodine appears to be released from this reactor compared to others.</p>
<p>Releases</p>	<ul style="list-style-type: none"> • Who decides how much effluent release is fine, and what guidelines are available for OPG to follow? How was it decided that the parameters have no differences?
<p>Emergency Management</p>	
<p>Exclusion and Emergency Protection Zones</p> <p>Severe Accident Management</p>	<ul style="list-style-type: none"> • That no new reactor be allowed by CNSC to be built within the exclusion zone of any other existing reactor. • That OPG be required by CNSC to derive science-based exclusion zones for both Darlington NGS and for the proposed BWRX-300 reactor according to the criteria laid out in U.S. NRC document 100.11. • Concept of PPE, the plant and site data that it collects was developed before the Fukushima disaster struck in 2012. That was also long before we all took a good look at the vulnerabilities to severe accidents that our reactors inherited and developed a semblance of accident management guidelines, engineered measures, new systems and coordination mechanisms for emergency planning. Given that the OPG PPE is so wanting in detail and the new reactor design make unsubstantiated claims about their infallibility, there is a need to reflect these topics in that in the PPE data. Both common sense and NEI-10-Rev. 2 guidelines require that severe accident mitigation related information be included and with clarity and detail. It feels like the parties never heard of Fukushima or the conclusions of its investigations into the root causes. • Effect of a severe core damage accident at an operating unit on safety of personnel engaged in construction of the new reactor(s) was not considered. The source term data given to the Emergency Management Organizations by utility running the operating reactors is irresponsibly fraudulent and cannot be used to prepare emergency evacuation or sheltering processes for our fellow citizens working on site.

Public Information	<ul style="list-style-type: none"> As a condition of siting new nuclear, the CNSC should require ongoing public education and clear communication about emergency preparedness and protective actions.
Environmental Effects and Risk Assessments	
<p>Environmental Assessment</p> <p>Site Characterization</p>	<ul style="list-style-type: none"> The EIS for the BWRX-300 must provide a sufficiently detailed description of the plant's design to allow for independent verification of numerical values that are assigned to various parameters such as source terms. It should not be accepted as a foregone conclusion that the Darlington site is necessarily suitable as compared with other sites. Site parameter characteristic data on effect of operations of the existing reactors on operation of the proposed new reactor (and vice versa) was not clearly given. The data set does not contain any information that would be necessary and be specific to the Darlington site where other operating reactors already exist. This includes data on Derived Emission Limits and actual emission history that would be added to that from new units.
<p>Climate Change</p> <p>Environmental Assessment</p>	<ul style="list-style-type: none"> Another relevant effect of DNNP would be the increase in water temperature via outflow into Lake Ontario. Thermal effects of the DNNP project should be considered alongside climate change already increasing surface water temperatures as a cumulative effect on the lake ecosystem. It is understood that the DNNP Project is subject to the Ontario Environmental Assessment Act, which typically has an expiry date for most projects. Please explain why there is no expiry date on the EA decision for DNNP, as well as how OPG justifies the project remaining within the original scope from 2011. The natural environment on the DNNP site as well as the surrounding land use has changed significantly over the last decade and must be taken into consideration. Concern that even if OPG concludes that the effect will be reduced compared to the original EA finding, there will still be an effect.

Environmental Effects	<ul style="list-style-type: none"> • What is the effect / impact will be and if the impacts are different with the new technology? • Limited shoreline work would be required under the new PPE/EIS due to the smaller footprint of the project. Please elaborate on details of the dredging so that we can better assess impacts to the environment. • It is unreasonable to conclude that because the east-west wildlife corridor has survived past fragmentation that wildlife will still be present during/after DNNP project construction. Cumulative effects of multiple activities on site over a long period of time could permanently impact the corridor disrupting connectivity and the surrounding ecosystem.
In-Water Works	<ul style="list-style-type: none"> • OPG should look into retaining part of the site for the wildlife corridor and keeping some of it fenced off to allow migration throughout the site preparation and construction period.
Mitigation Measures	<ul style="list-style-type: none"> • What are the environmental risks and mitigation measures of blasting and excavation vs. boring via tunnel machine. Which is less impactful to the environment? Request to be kept updated on the construction of the intake and discharge pipes offshore. • Please share the Fish Habitat Compensation Plan for review. • Does OPG have an approximate number for expected fish losses through impingement and entrainment? This would allow us to understand the comparison between expected losses and Lake Ontario fish populations. • Please update on the status of the wetlands on site and whether they will remain throughout the project. If they will remain, please inform us of the results of the effects assessment. If not, what will OPG do to compensate for the loss? • As stated in the EIS report, commencement of the project is occurring approximately 12 years later than the original date. What was the cause of such a significant delay? • In terms of environmental conditions on site, it should be noted that the project delay also allowed significant

<p>Mitigation Measures – Fish Impingement</p>	<p>ecological lands and SAR habitat to thrive and grow, which now must be destroyed.</p>
<p>Mitigation Measures – Terrestrial Environment</p>	<ul style="list-style-type: none"> • Comments were submitted to OPG and the ERO regarding OPG’s Endangered Species Act (ESA) Permit for the DNNP project site preparation. Concern raised regarding the lack of guarantee for long-term protection of the SAR habitat on site. A request for a conservation easement or restrictive covenant be placed on the created SAR habitat to ensure it is not destroyed during further site prep for reactors 2-4. It was suggested that an off-site ecological restoration fund as an alternative, but OPG was unwilling to accommodate either request.
<p>Species at Risk</p>	<ul style="list-style-type: none"> • Requests are considered feasible; therefore, it is not fair to say that “OPG endeavors to achieve feasible mitigation measures and/or accommodation”. • Is OPG not planning to impact the bank where the remaining swallows live as part of site prep? Given that bank swallow burrow counts have already been decreasing on site, is OPG able to relocate the SAR habitat or create habitat elsewhere for the species? • Later site preparation activities are likely to destroy the newly created SAR habitat on site as the remaining reactors are constructed and the Project footprint grows. Please explain how OPG plans to maintain protection of the natural features created to satisfy their ESA permit as the project proceeds. • Please explain how there is no further concern for the fish species if entrainment of Deepwater Sculpin has been identified recently on site? What does OPG mean by “fish protection measures will be taken if needed at the intake structures”? Requests that fish protection measures be taken at the intake structures regardless of prevalence of SAR or other factors. • See previous comment re. Bank Swallow. The plan is for 4 reactors to be constructed on site, and various site preparations are being undertaken that fit this scope (i.e., water intake structures are being built to handle 4 reactors). Why does the EIS suggest that this may not happen, and that the SAR

Thermal Plume	<p>habitat may be retained? It seems highly unlikely that the bank swallow habitat will remain if the project proceeds as planned.</p> <ul style="list-style-type: none"> • Will OPG be creating any beneficial actions or offsetting as they are likely to impact these two SAR species? Will DFO Authorizations be required? • Question about potential impacts from DNNP caused from warm water entering Lake Ontario. Were the impacts resulting from a thermal plume was included in the EIS and what considerations were included (i.e., algal growth, climate change).
Environmental Effects	<ul style="list-style-type: none"> • Table 1 identifies a very significant difference between the BWRX-300 and any other reactor designs considered in the 2009 EIS, that being that the reactor structure will penetrate 38 metres below ground level; this very important difference is given minimal treatment, and there is not enough information provided to fully evaluate, or to have confidence that OPG or their consultants have adequately evaluated the potential environmental consequences, including but limited to migration of radio-contaminants from the sub-surface structure to surrounding groundwater and potentially reporting to surface water; for example, there is no description of how monitoring will be undertaken or what mitigation measures might be employed; noted that there is a very brief (but inadequate) description in Section 4.1.2 and again in 5.2.2 where the potential for an effect on groundwater flow was identified as not having been considered in the 2009 EIS but this statement is not followed by any substantive discussion.
Further Studies	<ul style="list-style-type: none"> • Has the CNSC has done any studies on the lake water, water quality and fish consumption?
Environmental Risk Assessment	<ul style="list-style-type: none"> • It was noted that the panel stated that a new environmental assessment would not be required if the selected reactor technology is not fundamentally different from those used for the plant parameter envelope.

Mitigation Measures	<ul style="list-style-type: none"> • It was commented that it appears that the selected reactor technology is fundamentally different. Even if the chosen technology is smaller than the options studied in the original EA. • Have the studies conducted during the EA in 2009 have been updated? • Regardless of whether or not the reactor technologies are different, the environment has likely changed since 2009. • Comment that mitigation measures are not always effective, and populations are declining. Proponents should go above and beyond in their mitigation or offsetting to try to reduce the negative environmental impacts and work towards improving the environment. An example was replanting trees at a 10 to 1 ratio. • Comment that other species should be considered, not just species at risk. Recommendation including species that are culturally important to Indigenous Nations and communities or used for subsistence.
Environmental Effects	<ul style="list-style-type: none"> • Further, arguments relating to the “smaller footprint” for the BWRX-300 ignore the deeper foundations required for the BWRX-300 (38m compared to all other reactors in the initial EIS that had a foundation depth of around 13.5m deep). The excavation work required for the BWRX-300 will alter the water table at the site, though the ways in which it may do so, and for exactly how long, are not discussed sufficiently in the 2022 EIS report; • OPG asserts terrestrial effects of the BWRX-300 reactors will similarly be less than those identified for other reactors in the initial EIS since the surface area taken up by the reactors will be less for the BWRX-300 (19 hectares per reactor compared with the average 35 hectares for other reactors examined in the original EIS). The relative differences in disruption during construction of the BWRX-300 reactors versus other EIS reactors is under examined, and there is no evaluation of the likelihood that any saved surface area from smaller reactors would constitute significant gains in species habitat;

<p>Fundamental Differences Threshold</p> <p>Further Studies</p>	<ul style="list-style-type: none"> • OPG asserts the aquatic environment will be more protected by BWRX-300 than the other reactors in the initial EIS because its flow rate is relatively smaller. However, no assessment is provided to characterize the BWRX-300 flow rate and its impact on aquatic biota in more detail. • After reviewing the EIS and PPE, it became apparent that there was not enough information in either document to get a comprehensive sense of the potential adverse environmental impacts of the BWRX-300 modular reactor. There was also insufficient information to develop a clear understanding of how the BWRX-300 modular reactors would interact more generally with the local environment. For example, neither the EIS nor the PPE contain detailed information or data relating to: <ul style="list-style-type: none"> • The source, volumes, or discharge points for all identified contaminants to air, surface water, groundwater, and stormwater; • Exact treatment or mitigative efforts to address potential contaminants in liquid effluent, contaminant releases to air, groundwater or in stormwater; or • Additional environmental monitoring that will be required, should the BWRX-300 modular reactor be approved, to ensure against any significant adverse environmental effects. • Since the original EIS was prepared, it was considered in an Environmental Assessment that resulted in a series of additional information requests of OPG, and a final EA report in 2011 that specified the project could only proceed if the following studies were undertaken and resulted in findings that any identified environmental impacts could be mitigated to ensure against them becoming 'significant'. These studies included: [TRUNCATED] • Neither the 2022 EIS nor PPE systematically address any of these studies or their progress. As such, it remains
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	<p>unclear to what extent this ongoing work has been conducted. It remains unclear whether the studies themselves have been included in the supporting documents referred to in the EIS.</p>
<p>Environmental Effects</p> <p>Mitigation Measures</p>	<ul style="list-style-type: none"> • The species listed in this quote include Cultural Keystone Species. While the EIS does not identify a risk to these species, they should be prioritized in any monitoring of the aquatic community to ensure that there is no adverse effect on any Culturally Significant species in this community. • Wetlands are incredibly important to Indigenous culture and way of life and are protected by Treaty Rights. Any impacts to a wetland as part of this project are an infringement on these constitutionally protected rights. Furthermore, under the 2008 Water Declaration: “First Nations in Ontario have our own territories that includes the waters, which include the rain waters, waterfalls, rivers, streams, creeks, lakes, mountain springs, swamp springs, bedrock water veins, snow, oceans, icebergs, and the seas”. Indigenous Nations have rights and responsibilities to these wetlands and ponds on their territory. • Proponents should provide more clarity on the negligible changes expected to occur in wetlands and ponds and demonstrate how they will continue to monitor wetlands and ponds to ensure they are protected during and after the project. • Many amphibians and reptiles are Culturally Significant species and are protected under treaty rights. Indigenous Nations also have rights and responsibilities to the wetland and ponds on their territory. • The proponents need to clarify how they will be monitoring amphibian and reptile communities and habitat to ensure this project does not infringe on Inherent and Treaty rights. Wetland community surveys should be done prior to, and after construction to ensure the protection of wetland habitat and any Cultural Keystone Species making use of this habitat.

	<ul style="list-style-type: none">• Many Culturally significant species could be using this corridor and disruptions to their movement patterns can be disruptive to their overall health. This work may also affect harvesting and hunting in the area, particularly if it disrupts wildlife movement.• Have the proponents considered how this disruption may infringe on inherent and treaty rights? Has there been considerations for how workers will interact with any Indigenous People they may encounter practicing these rights during the project?• The proponents should clarify the process they are taking to reduce disruption and other associated harm to wildlife (e.g., vehicle mortality). Proponents should clarify how this work will not infringe on Inherent and Treaty Rights.• Many birds, especially raptors, are Culturally Significant species. The full effects of this habitat loss should be known, specifically which birds might be affected and how, and a plan to restore habitat should be in place.• The proponents should clarify how they will monitor the bird communities, including the identification of any Cultural Keystone Species, that may be affected by project activities. Proponents should also specify how they will restore this habitat after the project and work with Indigenous Nations to develop these restoration plans.• As indicated in the EIS, four bat species identified on the DNNP site are listed as endangered (Little Brown Myotis, Northern Myotis, Eastern Small-footed Myotis, and Tri-colored Bat). It is important that these species and their habitat are protected from any adverse effects related to this project.• Response has been provided to OPG that speaks to the need for monitoring the effect of dust and noise on the bat populations and the invertebrate community, specifically aerial insectivore prey for bats. The suggestions given in that document related to monitoring should be incorporated into this project.• There is no mention of Monarch butterflies (<i>Danaus plexippus</i>) in this area, do they use this habitat?
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Species at Risk	<p>Monarch butterflies are listed as endangered by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC. 2021). There is also no mention of milkweed (<i>Asclepias</i> spp.), a species critical in the monarch lifecycle. Have surveys for milkweed been carried out? Does OPG have a plan in place to restore lost habitat or lost milkweed plants which are essential components in the monarch life cycle?</p> <ul style="list-style-type: none"> • Proponents should clarify how they will monitor the area, including an assessment of milkweed plants, especially in areas that will be affected by project activities. Proponents should also specify how they will restore this habitat and work with Indigenous Nations to develop this restoration protocol. • Why were Cultural Keystone Species not included or mentioned within the document?
General	
Availability of Documents	<ul style="list-style-type: none"> • Even simple, typically publicly available information on reactor designs was not made available for the design ultimately chosen under the inexplicable guise of being 'proprietary'. Such blatant cover of 'proprietary' information is inconsistent with the vendor's obligations to people of Canada where the vendor hopes to benefit from a proof of concept with public funds. Reactor data on new Chinese reactor designs is more abundantly available than was made available for BWRX-300. This is not a time machine design, or a shoulder carried hypersonic missile design. • Public relations propaganda about the chosen reactor design's safety was freely dispensed without giving any numerical information on the reactor design that could be verified by nuclear safety experts working in public interest. • We propose that the current PPE be not accepted as surrogate to anything, and a renewed set of documents be prepared that details the actual data for BWRX-300 and issued for comments to me. It should include enough information on each of the reactor designs that were considered (as a summary design description with

<p>Land-Use Planning</p>	<p>pictures and tables and references) and a much broader discussion of the chosen BWRX-300 design.</p> <ul style="list-style-type: none"> • An important omission in the PPE and site description is in discussion of why the new build HAS TO BE within an existing station’s exclusion boundary, despite all the risks such a decision entails. • A composite spreadsheet for all vendor data was not created (one column for each design). While bounding values (numerically maximum or minimum of data sent in by the vendors without any accompanying description) were identified, no rationale for comparing the supplied data with diverse origins, meaning or credibility was discussed. There was no discussion of any missing data, consistency check within vendor data set or any discussion of any reasonableness of data or error margins. These are actually explicit requirements and expectations in repeated NRC and NEI documents on the subject. A mere dump of bounding values makes no meaningful contribution to the stated intent.
<p>Parameters Analysis</p>	<ul style="list-style-type: none"> • The PPE provided bounding values for 3 reactors tabulated in 2009 for them by Condesco with ZERO additions made through the next 13 years or any feedback from any person or organization. • The process of arriving at the bounding value is not transparent as the data provided by each of the three vendors that dominate the information scape is not individually tabulated or referred to in a separate summary document for the design. That should have been an easy thing to do and with sufficient volume of information on the actual design, a proper way of verifying if the bounding data values were in context of ANY new design that may show up on the horizon layer, just as the BWRX-300 did, many years after the PPE was issued first. Observations on the specific features of a reactor design from which the bounding value was derived were not made.
<p>Procurement Timelines and Process</p>	<ul style="list-style-type: none"> • Information on fuel procurement • Main contention is that the present procedure lacks validity given the realities of the post-Fukushima world and the paucity of information provided about the

	<p>BWRX-300 boiling water reactor – a type of reactor that was never considered in the original EIS</p>
Availability of Documents	<ul style="list-style-type: none"> To increase transparency, the Intervenor submit that OPG should be required to make all non-confidential documents readily available for public viewing, either via hyperlinks within documents, or through an archived database on their website. Information must be shared with the public in a timely manner.
General	<ul style="list-style-type: none"> Why did the due diligence process result in the selection of the BWRX-300 if that specific technology wasn't studied in the design of the PPE? As per above comments, concerns regarding the lack of guarantee for long-term protection of the SAR habitat on site in previous consultations. OPG was unwilling to accommodate either of our requests. Although OPG may be unaware of the exact contents of the WTFN settlement agreement (2018), they do have relationships with many of the seven Treaty Nations. Through these relationships, OPG is aware that protection of the environment and living relatives is of high priority. When identifying rights impacted by the project and working toward accommodations, OPG should consider what they are hearing directly from impacted First Nations.
Indigenous Nations Relationships	
Timelines and Processes	
General	<ul style="list-style-type: none"> It is recommended that consistency be maintained in the units of measurement to prevent potential errors in the future. Section 17.1.2 provides the value in "tonnes," while section 18.1.2 provides the value in "metric tons." Sections 9.3.1, 10.1.1, and 10.1.2 make reference to CNSC G-129, which has been superseded by REGDOC 2.7.1 as of July 2021. While it is understood that G-129 requirements are a part of REGDOC 2.7.1, it is recommended that current regulatory documents be referenced throughout. This ensures consistency and

	<p>communicates an understanding of and adherence to current safety regulatory requirements.</p> <ul style="list-style-type: none"> • There is inconsistency in the units used for land area measurement in the document. Specifically, hectares are used in section 2.7.1, while both m² and acres are used in section 3.3.1. Additionally, the values provided in the actual "acreage" section (17.2) are in hectares, which further adds to the confusion. It is recommended that uniformity in the units be used for land area throughout the document to avoid any ambiguity.
Timelines and Processes	<ul style="list-style-type: none"> • What are the expected timelines for the DNNP?
Timelines and Processes	<ul style="list-style-type: none"> • As discussed above, both the EIS and PPE are highly context-dependant documents, part of a process initiated in 2009 that was subject to two court rulings (though ultimately affirmed). This full context and the supporting documents referenced in OPG's EIS and PPE should have been made available alongside the 2022 EIS and PPE documents themselves – both on the CNSC consultation website as well as OPG's own website. The follow-up studies required by the EA report of the JRP should also have been explicitly discussed by OPG in their application and shared online with the public along with the current EIS and PPE documents. This is still something that can be done now, as intervenors like ourselves continue to study this proposal and prepare for any further environmental review or application by OPG for a licence to construct new reactors at the Darlington site. • Projects like these underscore the importance of proactive routine environmental performance disclosures, so that members of the public can ground their reviews of the proposed project in larger understandings of the Darlington site and how existing nuclear facilities engage with the local ecosystem in which they are embedded.
Indigenous Nations Relationships	<ul style="list-style-type: none"> • Why is there no mention of the Gunshot Treaty within the land acknowledgment and in the report? How are Inherent and Treaty Rights upheld throughout the provided report?
Hazards Assessment	

<p>Severe Accident Management</p> <p>Severe Accident Assessment</p>	<ul style="list-style-type: none"> • Some very important lessons were learnt from Fukushima. There is no mention of any comparison of risk between various designs; especially from BWRX-300 except that claims of eternal and near absolute safety are made. • Drawing on the lessons of Fukushima regarding the special vulnerabilities of co-located reactors, respondent urges that construction of any new reactors within the exclusion zone of the existing DNGS four-reactor complex must be ruled out as against the public interest.
<p>Fire Protection</p> <p>Severe Accident Management</p> <p>Severe Accident Assessment</p>	<ul style="list-style-type: none"> • OPG should conduct a thorough assessment of the hazards associated with spent fuel fires at the Darlington nuclear power plant. • OPG needs to revisit the hazard assessment of a large military aircraft accident in proximity to the BWRX-300 reactors. • OPG should conduct a hazard assessment of malevolent drone use on SMRs like the BWRX-300 reactor design, even if the likelihood of such an event occurring is low. • The Intervenors submit that the low frequency of commercial aircraft accidents should not be a reason to screen out the risk. OPG must analyze the hazards associated with and impacts due to a commercial aircraft hitting the reactor building, or the waste management facilities, or any of other facilities and buildings located on the Darlington site. • The potential for and effects of a multi-unit accident must take into consideration the relationship between the existing reactors of the Darlington Nuclear Generating Station and the proposed BWRX-300 reactors. • OPG should carry out a full-fledged severe accident analysis considering the challenges of estimating the reliability of the Passive Isolation Condenser System in order to show how the BWRX-300 design will adhere to CNSC requirements.
Licensing	
<p>Environmental Assessment</p>	<ul style="list-style-type: none"> • In keeping with the CNSC regulatory practice as outlined in PPE-2, OPG should be required to prepare a

Licensing	<p>new environmental impact statement with high level design information about the BWRX-300.</p> <ul style="list-style-type: none"> • CNSC shall ensure that all the conditions laid down by the JRP are fully implemented before a construction licence is considered. • CNSC shall require OPG to publish, in tabular form, all measures taken to implement each applicable JRP condition and sub-condition, with links to appropriate documents detailing how the implementation was carried out. CNSC staff shall certify that the implementations have been satisfactorily realized or that they must be redone
Licensing	<p>Land-use Planning</p> <ul style="list-style-type: none"> • The CNSC should direct CNSC staff to review the current and planned provincial land use directions under the Places to Grow Act and other indications of provincial intent to continue increasing density in this area; to ensure land use compatibility in the vicinity of major facilities, which includes energy generation facilities. Specific regard should be given to population density and growth around nuclear generating stations and impacts of new and additional nuclear on the implementation of emergency measures. • With recent legislative changes in Ontario opening sections of the Greenbelt to development, the CNSC should require OPG to address how unplanned density growth within Durham Region is considered for emergency planning for the DNNP site. • The CNSC must exercise its jurisdiction and fulfill the federal constitutional jurisdiction over nuclear site approval. Any siting decision must ensure the protection of the public and environment for the intended lifespan of the new nuclear development. This decision must also account for changes in land use, population density, climate, and environmental factors. No amount of subsequent regulatory action short of license termination can adequately protect the public if an unsuitable site is selected.
Environmental Assessment	<ul style="list-style-type: none"> • As mentioned, the selected BWRXT reactor was not one of the reactors considered in the original EIS or PPE. Although OPG states that the BWRXT reactor is not

Licensing	<p>fundamentally different than those previously considered, this will be North America's first SMR. Does this not justify a new EA to ensure the technology fully conforms with the current environmental conditions and parameters?</p> <ul style="list-style-type: none"> • To clarify, the Government of Canada delegated this determination to the CNSC? What dictates what is "fundamentally different" between SMR technologies, and how did the CNSC come to this decision? • Please explain the reasoning behind creating the PPE before selecting a specific reactor technology. This does not seem like the best method to ensuring the chosen reactor is environmentally and physically compatible with the DNNP site. Why did OPG take this selection approach?
Regulatory Codes and Standards	<ul style="list-style-type: none"> • The PPE approach utilized in the document is based on a U.S. methodology. It is noted that at least five "NUREG" documents were referred to within the document (i.e., publications prepared by US Nuclear Regulatory Commission Staff). It would have been preferable to refer to documents that apply directly to the Canadian regulatory environment, but as this is the first preliminary assessment for an SMR there is no Canadian example to point to. It is important that the adoption of any methodology be based on a sound rationale that is applicable to the Canadian context. This approach should help ensure that the regulatory framework in Canada is well-defined and effective in overseeing the implementation of Small Modular Reactors (SMRs). If SMRs are to become an important part of Canada's solution to producing low carbon electricity, and if Canada is to take a leadership role in all things SMR, especially where safety is concerned, it does make sense for the Canadian SMR proponents and for the Canadian regulatory agency to continue moving towards developing assessment methods devised for the Canadian regulatory environment.
Environmental Assessment	<ul style="list-style-type: none"> • In addition to the question of the BWRX-300's "fundamental difference" to other reactor technologies,

	<p>or not, there are other public interest arguments for a new EA. Since the completion of the EA for the DNNP, federal environmental assessment legislation has changed twice. New species at risk have been listed and are present in the vicinity of the Darlington site. Further, the underlying need for these projects, and changes in energy demand forecasts and energy mixes since 2006 have been significant – as have public decision-making processes in the province relating to these types of determinations. EIS revisions (between 2010 and 2022) were dormant for 12 years, and the initial EIS is now 14-17 years old.</p>
Operations	
Reactor Operations	<ul style="list-style-type: none"> • How much water is used in this process, and is it lake water? What happens to the water once it has been used as a coolant/moderator? • In past discussions with OPG/CNSC staff regarding the BWRXT technology, we were told there is no "spent water" and that the process occurs in a continuous loop. Can this concept be further elaborated on? Does the process not generate wastewater?
Reactor Operations	<ul style="list-style-type: none"> • While section 3.1 provided a reasonable summary of the of the general characteristics of the reactor, this section of the report – or other sections – did not provide an indication of burnup; it is important to know the expected burn-up to anticipate composition and properties of the spent fuel and this information is not provided
Radiological Dose	
Source Term Inventory	<ul style="list-style-type: none"> • No comparison of source terms between 4 reactors without giving any information about the reactors, their vulnerabilities, accident scenarios, release locations, release frequencies is meaningless. • Source term from normal operation from a number of release points was provided (also recommended by NRC in its review of NEI-10) with certain entries missing. Source term from regular emissions was provided without providing any information on its nature (continuous or frequency of puffs if any) and what

	sources it includes, of basis of its derivation, analytical assumptions and tools.
Effects on Humans	<ul style="list-style-type: none"> • It is our understanding that water interacts with the radioactive bundles in the BWRX-300 design. Has the PPE considered the effects on humans and the environment if the radioactive water interacts with the environment? It is our understanding that the interaction of water with the nuclear bundles is unique to this design.
Effects on Humans	<ul style="list-style-type: none"> • Section 4.13 discussed three parameters associated with airborne and waterborne releases of radioactive contaminants that result in doses to the public were outside of the parameters assessed in the EIS, and notes that "The three parameters associated with airborne and waterborne radioactive releases required a separate study to assess their effect and compare it with what was assessed in the EIS..."; This reference [14] was requested "Amendola and R. Parker, "DN Dose Calculations for Gap Analysis," on February 23 and received it on March 10th, but this arrival date – regrettably – left insufficient time for our experts' review; the referenced documents are not available online and there can be a significant time lag between making the request and receiving the document, in those instances where the document is provided and this is problematic in all reviews, including in this instance. • Section 5.3.6 "Radiation and Radioactivity Environment" makes an important statement about Radiation and Radioactivity Environment being considered a pathway to effects in other environmental components, but provides no supporting documentation
Source Term Inventory	<ul style="list-style-type: none"> • [Table 5 in the EIS] presented in both the PPE and EIS documents indicates that the BWRX-300 has higher levels of releases for certain isotopes compared to the other reactors evaluated, even though the overall dose from the four proposed SMRs is stated to be less than that already included in the EIS. It would be helpful to obtain details on how the

	<p>dose was calculated or provide a summary of dose of the radionuclide groups.</p> <ul style="list-style-type: none"> For example, the Institute invites further elaboration on why the BWRX-300, despite generating less electricity than the other reactors assessed, is expected to have higher annual airborne releases of radioiodine and a higher solid waste component of radioiodine release, as indicated in the PPE and EIS documentation. This is particularly relevant to public concern, given the need to distribute iodine pills in the event of an accidental release. A more in-depth discussion of all the airborne and liquid effluent source terms would have been beneficial.
Safeguards	
Non-Proliferation	<ul style="list-style-type: none"> What are the global security considerations for this technology are and who is responsible for that? Where would the fuel come from?
Wastes	
Decommissioning	<ul style="list-style-type: none"> Decommissioning costs Decommissioning responsibility
Decommissioning	<ul style="list-style-type: none"> Without a decommissioning plan designed specifically for a BWRX-300 reactor, it is not possible to determine whether the technology selected by OPG complies with the EIS. We request that the CNSC require OPG to outline a detailed and non-theoretical decommissioning plan for the BWRX-300 reactors before any further assessments occur for the DNNP site.
Decommissioning	<ul style="list-style-type: none"> It is disappointing that OPG has not created a decommissioning plan or even a preliminary strategy for the BWRXT reactors/DNNP site. OPG's own website states "It is imperative that Preliminary Decommissioning Plans (PDP) are put into place for OPG's generating facilities." It is irresponsible to begin a project of this size without a decommissioning strategy, this is a requirement for most major projects on Crown land. Please provide the decommissioning strategy for the BWRXT-300 as soon as it becomes available. It is recommended that a strategy be implemented before any further site-prep is conducted.

Waste Inventory and Storage	<ul style="list-style-type: none"> • It is concerning that the solid waste anticipated to be generated by the BWRXT technology is even higher than initially reported in the EIS. There is still no long-term plan for the safe management and storage of nuclear waste in Ontario, and Indigenous Nations must live with the risk of temporarily storing this excess waste in their Treaty Territory, at the DWMF, without ever providing their consent. This should be considered before construction of the remaining reactors.
Practices	<ul style="list-style-type: none"> • The statement in Table 3 in Section 3.6 that “There is no change in the description of waste management practices” is misleading at best; while little information is provided in these documents about the fuel or the waste or their characteristics it is known that the wastes will have different characteristics (for example, a different burnup rate) and different dimensions than CANDU waste, which is the subject of all waste management practices in Ontario at present; so the document may parse the situation to say there is “no change to the description” of waste management practices, but that could only be the case if the ‘description’ was of management practices other than for the current and past wastes generated by OPG reactors; this parsing characterizes the problem with the approach CNSC as adopted, wherein the comparison is being made to an inadequate report about theoretical reactors from over a decade ago, rather than describing the currently proposed reactor in sufficient detail, including the associated and ancillary activities, including and particularly waste generation and management. • Section 4.1.4 “Solid Waste and Spent Fuel” states that a) solid waste volumetric activity (Bq/m³) generated by the operation of the BWRX-300 is higher than what was assessed in the EIS but that there will be equipment changes in response and b) the weight of the cask used to transport the BWRX-300 spent fuel on site (113 tonnes) is heavier than the cask assessed in the EIS, but the roads will be upgraded in response , and then indicates that “there is no impact on the EIS conclusions

<p>Volume of Wastes Produced</p>	<p>as a result of these mitigation measures”; insufficient details is included about the waste and the waste containers, but this is far to simplistic a response to be credible; this is another example of why a full examination of the project through a full environmental assessment is required.</p> <ul style="list-style-type: none"> • Section 5.2.8 makes assertions with respect to the volumes of L&ILW and used fuel to be generated from the BWRX-300 being lower and the land area required for used fuel dry storage being smaller than what was assessed in the 2009 EIS but provides no actual information about the fuel, the various wastes, or the dry storage systems; the document should include supporting data, or at least live links to documents which include the supporting data • Section 5.2.13 “Operation and Maintenance Phase” includes statements that the BWRX-300 used fuel pool is smaller than what was assessed in the EIS but that the change in capacity is accounted for through the availability to move used fuel earlier and that it is planned that used fuel storage facilities will be available once the BWRX-300 starts operation and that dose consequence due to higher activity will be managed through appropriate cask and shielding design; these statements are not referenced, and no supporting information is provided; several questions arise, include: why will used fuel be moved earlier and how much earlier and to where? Which casks are being referred to in the statement that the higher activity will be managed through cask and shielding design? i.e., interim dry storage, transportation or perpetual care casks? • Figure 5 in Section 3.2 on Conceptual Plant Layout does not identify the location of the various radioactive waste storage facilities; these are listed on page 17, but their locations are not identified and there are no, or inadequate descriptions provided. • Section 3.4 indicates that irradiated fuel and low and intermediate level waste will be stored on the site, but the report does not include a detailed description of
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<p>Waste Inventory and Storage</p>	<p>liquid, radioactive waste management systems, although a generic description is found in later sections of the report.</p> <ul style="list-style-type: none"> • Section 3.6 states that “There is no change to the description of waste management practices in Ontario. The process in this section applies to the BWRX-300 deployment; L&ILW will also be produced, and will be processed on-site, and shipped to an off- site OPG licensed facility”; while that may very well be the case, the very general statements offer little basis for review and are not a substitute for a detailed description and discussion of radioactive wastes. • Section 3.7 states that “Management of spent fuel for BWRX-300 will also use an on-site dry storage facility”, but no additional information is provided, such as: how long will the dry cask storage be in operation? What will be the state of the fuel after this period? Are there provisions for repackaging defect fuel assemblies? • Table 4 similarly makes the assertion that “the description of the on-site dry storage facility in the EIS is applicable to the BWRX-300 deployment; this statement is unsupported by an actual detailed description of the on-site dry storage facility, and would require comparison to a detailed description of dry storage facilities for the 2009 fleet of conceptual reactors; at minimum, a comparison of the BWRX-300 “Radioactive Waste Management Plan”(scheduled for release in Q1 2023) to the 2009 Nuclear Waste TSD would be required, although at this point we cannot be confident that the BWRX-300 “Radioactive Waste Management Plan”(scheduled for release in Q1 2023) will contain sufficient detail and information about dry storage facilities. • The BWRX-300 deployment will transport the L&ILW off-site to an OPG licensed facility. The description of the on-site dry storage facility in the EIS is applicable to the BWRX-300 deployment. Again, not much can be said about such statements without more documentation.
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	<ul style="list-style-type: none"> • The report states in Section 3.7 that “The volume of L&ILW and used fuel generated from the BWRX-300 deployment over the 60 years of operation is estimated to be less than for the larger reactors assessed in the EIS”; this statement is not consistent with the findings set out in the expert paper Nuclear waste from small modular reactors¹³ (Krall et al.,2022); this is a key point – do the report authors have actual information to support this questionable statement. • Section 5.7.2 “Radiological and Transportation Malfunctions and Accidents” describes the BWRX-300 radiological waste as containing different proportions of radionuclides than the waste that was assessed in 2009 EIS, and notes that the mass of fuel placed in the spent fuel transfer cask is different than what had been assessed in the EIS; this section states that the assessment of radiological malfunctions and accidents involving radioactive waste and used nuclear fuel was reanalyzed for the BWRX-300 “using the same scenario as was examined in the EIS” and then goes on to say that the reassessment lead to the same conclusion, but it does not provide any of the supporting data, discussion of documentation; for this and for the other re-evaluations of accidents (e.g. transportation accidents, damage to spent fuel) further information is required; also, in evaluating the probability and consequences of accidents all four of the proposed BWRX-300 reactors should be considered as a system, and this cannot be determined based on the very limited information provided; one of the lessons at Fukushima was that there can be disadvantages to having reactors connected by the same supporting systems and it is not clear from these documents if the systems for each reactor unit are independent or combined; more detail is required in order to assess or review critical assertions on exposure to the public.
Decommissioning	<ul style="list-style-type: none"> • Noted there is a long-term impact of the project on the land and asked who gets the land after it is 'abandoned', and whether it becomes crown land.

Volume of Wastes Produced	<ul style="list-style-type: none">• OPG asserts BWRX-300 will generate smaller volumes of waste than the reactor models examined in the initial EIS, and argues this factor indicates a smaller environmental impact.⁸ However, these wastes have higher radioactivity levels, than other CANDU wastes at the Darlington site. It is unclear from the 2022 EIS and PPE how this higher activity is taken into consideration when evaluating impacts and management requirements for spent fuel from the BWRX-300 reactors.
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