To: Impact Assessment Agency of Canada (IAAC)
From: Canadian Coalition for Nuclear Responsibility (CCNR)
Re: Initial comments on the Summary of the Project Description for the New Nuclear at Wesleyville project (NNW)
Date: February 11 2026

CCNR and Nuclear Reactor Licensing

The Canadian Coalition for Nuclear Responsibility (CCNR) is a federally incorporated not-for profit organization, dedicated to education and research on a wide range of nuclear issues, both civilian and military – including non-nuclear alternatives – especially those issues pertaining to Canada.

CCNR has been actively intervening in reactor licensing decisions for more than five decades. In the early years, CCNR provided expert testimony on nuclear reactor safety, and cross-examined nuclear experts from Ontario Hydro, Atomic Energy of Canada Limited, and the Atomic Energy Control Board over a period of three months, during public hearings of the Royal Commission on Electric Power Planning (1976-77-78). In its 1978 report on Nuclear Energy in Ontario entitled A Race Against Time, the Commission found that Dr. Edwards' estimate of the probability of a core meltdown in a CANDU reactor – based on published industry reports – was "more credible" than estimates given by nuclear industry experts. Dr. Edwards is the CCNR president.

Dr. Edwards, as president of CCNR, presented five times to the Select Committee on Ontario Hydro Affairs (1979-1980) (always by invitation) on nuclear reactor safety and other related issues. A couple of years earlier, in 1976, at the Cluff Lake Board of Inquiry into Uranium Mining in Saskatchewan, Dr. Edwards cross-examined Dr. Norman Rasmussen, head of the Nuclear Engineering department of MIT and principal author of the definitive 8-volume US NRC Reactor Safety Study.

Over the years, CCNR has actively participated in public hearings related to Pickering A & B, Bruce A & B, Gentilly-2, Point Lepreau and the NRU reactor at Chalk River. In more recent times, CCNR provided expert testimony to the Joint Review Panel for the Darlington New Build project back in 2010-2011. CCNR has subsequently given expert testimony to CNSC on three separate occasions – 2022, 2023, 2024 – after the BWRX-300 reactor design was chosen by OPG as their reactor of choice for DNNP. See www.ccnr.org/CCNR_CNSC_DNNP_Construction_Licence_2024.pdf for example.

Wesleyville could almost double Ontario's nuclear capacity

With the complete shutdown of the four reactors at Pickering A in 2025, Ontario's nuclear capacity is currently 11,800 megawatts of electrical power. By adding another 10,000 megawatts at Wesleyville, OPG would be almost doubling the province's capacity. To be precise, at 10,000 MWe, the Wesleyville plant alone would represent an 85% increase over the current nuclear capacity for the province of Ontario.

Imagine the Port Hope area having the equivalent of the Pickering B, Bruce A, Bruce B, and Darlington nuclear stations all operating together on one site, minus fifteen percent. More precisely, imagine the 4 Pickering B units, the 4 Bruce A units, the 4 Bruce B units, and 2 of the 4 Darlington units – 14 large CANDU reactors –operating at full power. All things being equal, the impacts of such an agglomeration of reactors would be greater than anything that has ever been seen before – in Canada or anywhere else.

CCNR took the liberty of consulting the Radionuclide Release Datasets available on the Open Canada web site, which specifies radionuclide releases from all of Canada's nuclear generating stations for the last 15 years (from 2011 to 2025). From the downloaded spread sheet it is clear that, every year, each operating CANDU reactor releases well over 100 trillion becquerels of radioactive hydrogen (tritium), more than 100 billion becquerels of radioactive carbon-14, and several hundred thousand becquerels of radioactive iodine-131 to the outside environment, along with a goodly smattering of alpha-emitting and beta-emitting particulates of many varieties. Given the magnitude and persistence of these routine radioactive releases, and bearing in mind that these are known to be carcinogenic and mutagenic agents, it is evident that describing nuclear power as a "clean" energy source is simply a falsehood.

Using the dataset from Open Canada, the total amount of carbon-14 released from Ontario's CANDU reactors over the fifteen year period from 2011 to 2024 (using simple addition) is 96.4 trillion becquerels. Because carbon-14 has a very long half-life of 5,700 years, there is no significant reduction in the carbon-14 inventory over this fifteen year period.

Once the Wesleyville plant is completed, if OPG were to choose the CANDU option, it will be releasing about 85 percent of that amount of carbon-14 in every fifteen year period of operation; that's about 82 trillion becquerels added to the environment every 15 years. And it will continue to accumulate, year after year; it won't disappear. The total accumulated amount of carbon-14 will remain in the local environment with very little attenuation for millennia after the entire Wesleyville complex is shut down.

Tritium, on the other hand, has a 12.3 year half-life, so only about 94% of last year's tritium will still be around this year. Using the half-life of tritium to adjust for radioactive decay, on a year-by-year basis, we can use the same Open Canada dataset to find the total amount of tritium remaining in the environment today as a result of the last fifteen

year's worth of emissions from all of Ontario's CANDUs: it is 39,387 trillion becquerels – in other words, 39.4 quadrillion becquerels of tritium. At Wesleyville, the tritium burden will be about 85 percent of that figure after just fifteen years of full operation, or 33.5 quadrillion becquerels of tritium. One becquerel is one atomic disintegration per second.

Evidently, if we included all the previous years' emissions as well, the totals for both carbon-14 and tritium would be correspondingly larger.

Both tritium and carbon-14 are very weak "beta emitters". They are generally harmless outside the body; the beta particles (β-particles) they emit cannot penetrate deeply enough to reach the living cells inside the body. However, tritium forms radioactive water molecules (H2O where the H is radioactive hydrogen) and water is easily ingested, inhaled, or absorbed through the skin. There is no affordable domestic or municipal water purification technology that can remove tritium from drinking water.

Tritium and carbon-14 are "internal emitters". That's where the danger lies. The International Agency for Research on Cancer (IARC) says all beta-emitters are Group 1 carcinogens, including tritium (which they refer to as "hydrogen-3").

- β-Particles emitted by radionuclides, irrespective of their source, produce similar patterns of secondary ionizations and the same type of localized damage to biological molecules, including to DNA. These effects include DNA double strand breaks, chromosomal aberrations, gene mutations and cell transformation.
- All radionuclides that emit β-particles and that have been adequately studied, have been shown to cause cancer in humans and in experimental animals. This includes hydrogen-3, which produces β-particles of very low energy, but for which there is nonetheless *sufficient evidence* of carcinogenicity in experimental animals.
- β-Particles emitted by radionuclides, irrespective of their source, have been shown to cause chromosomal aberrations in circulating lymphocytes and gene mutations in humans in vivo.

Screen shot from p.298 of IARC Monograph 100D
"Internalized beta-particle emitting radionuclides"

And, as the Canadian Cancer Society states on its web page, “Carcinogens should be removed or replaced with safer options. If it’s not possible to get rid of a carcinogen or find something safer, it’s important to reduce the amount of exposure to as low as reasonably achievable or reduce the time you spend around it as much as possible.”

As the proponent of the New Nuclear at Wesleyville project, OPG should be required to document in detail the expected cumulative radioactive loading of the environment due to routine emissions of tritium, carbon-14, and other post-fission radionuclides, to the atmosphere and to the water bodies. OPG should also be required to demonstrate in detail why these environmental loadings are “as low as reasonably achievable” (ALARA).

While it is true that light water reactors release far tritium and carbon-14 than CANDU reactors, even if such emissions are lower by a factor of 100 or even 1000, there is still a very substantial environmental loading at the end of the day. The situation is not qualitatively different, and the expected cumulative loading is still significant.

There is a good deal of farming that takes place in the Wesleyville area. In particular, there are organic farmers who pride themselves on growing produce that is free from various toxic and carcinogenic chemicals. OPG should be required to demonstrate how these farmers can protect their crops (and their families) from radioactive contamination in an affordable fashion.

Alternatives to the New Nuclear at Wesleyville Project

The Impact Assessment Act requires the proponent to consider alternatives – not only alternative methods of achieving the proposed project, but also alternatives to the project:

> **22 (1)** The impact assessment of a designated project, whether it is conducted by the Agency or a review panel, must take into account the following factors:
>
> - **(d)** the purpose of and need for the designated project;
> - **(e)** alternative means of carrying out the designated project that are technically and economically feasible, including through the use of best available technologies, and the effects of those means;
> - **(f)** any alternatives to the designated project that are technically and economically feasible and are directly related to the designated project;

It is well established that renewable energy (wind and solar) – with storage – is substantially less expensive than nuclear power. These renewable technologies produce carbon-free electricity without creating any new toxic or carcinogenic materials as a result of the electricity generation.

Nuclear power, on the other hand, creates hundreds of new radiotoxic elements (called “radioactive isotopes” or “radionuclides”) that were not found in nature before 1940. In addition to routine radioactive pollution, nuclear power leaves a radioactive legacy that will remain dangerous for well over a million years. That legacy includes used nuclear fuel as well as structural materials in the core of the reactor that are so radioactively contaminated that they cannot be recycled or reused for other purposes but must be isolated from the environment for thousands of years,

OPG should be required to demonstrate why nuclear power – which is slower to deploy, more expensive to build, and more polluting to operate, is preferred over renewable systems. See the chart below, from Lazard. Lazard is considered a top-tier Wall Street financial advisory and asset management firm, founded in 1848. Please note that the highest cost of solar-with-storage or wind-with-storage is significantly less than even the lowest projected cost of nuclear power.

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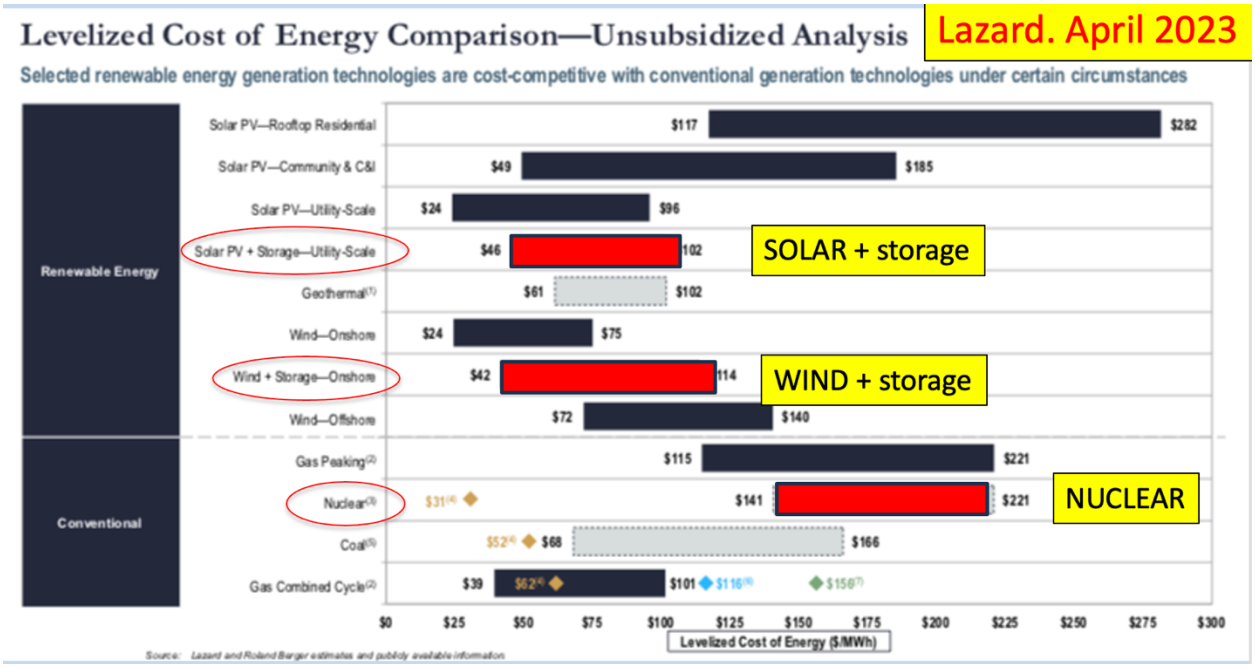

Although this chart is from Lazard’s 2023 “levelized cost of energy” report, the newer 2025 report displays the same relationship as that illustrated above. The 2025 report also adds the following remark:

1. **Renewables Remain Competitive: Unsubsidized Wind & Solar Lowest Cost Generation Sources for Last 10 Years**

Despite facing macro challenges and headwinds, utility-scale solar and onshore wind remain the most cost-effective forms of new-build energy generation on an unsubsidized basis (i.e. without tax subsidies). As such, renewable energy will continue to play a key role in the buildout of new power generation in the U.S. as the lowest-cost and quickest-to-deploy generation.

A Host of Requirements identified by the 2011 Joint Panel Report for the DNNP.

CCNR has studied the extensive list of recommendations and conditions that were laid down by the Joint Review Panel examining the Darlington New Nuclear Project (DNNP) back in 2010-2011. We have identified a significant number of those findings that we believe should apply also to the New Nuclear at Wesleyville (NNW) project.

We urge IAAC to embrace these selected recommendations, as the Joint Review Panel did 15 years ago. They are preconditions for OPG to abide by following a full impact assessment, which CCNR believes should be in the form of a panel review.

DNNP Joint Review Panel Recommendations (Excerpts – 9 pages)

Prior to Site Preparation

Recommendation # 2 (Section 4.5):
The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission require OPG to conduct a comprehensive soils characterization program.

Recommendation # 6 (Section 4.6):
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 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 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.

Recommendation # 7 (Section 4.6):
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 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.

Recommendation # 8 (Section 5.1):
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, NO_2 , SO_2 , SPM, $PM_{2.5}$ and PM_{10} , 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.

Recommendation # 9 (Section 5.1):
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 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.

Recommendation # 10 (Section 5.2):
The Panel recommends that the Canadian Nuclear Safety Commission require OPG to undertake a detailed site geotechnical investigation prior to commencing site preparation activities. The geologic elements of this investigation should include, but not be limited to:

- collecting site-wide information on soil physical properties;
- determining the mechanical and dynamic properties of overburden material across the site;
- mapping of geological structures to improve the understanding of the site geological structure model;
- confirming the lack of karstic features in the local bedrock at the site; and
- confirming the conclusions reached concerning the liquefaction potential in underlying granular materials.

Recommendation # 12 (Section 5.3):
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 …. 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.

Recommendation # 13 (Section 5.3):
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.

Recommendation # 20 (Section 5.5):
The Panel recommends that the 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.

Recommendation #22 (Section 5.5):
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.

Recommendation # 25 (Section 5.5):
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.

Recommendation # 38 (Section 5.9):
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 potential shall be assessed with the site investigation data; and
- 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. During site preparation and/or prior to construction:
- verification and confirmation of the absence of surface faulting in the overburden and bedrock at the site.

Prior to construction:

- measurement of the shear strength of the overburden materials and the dynamic properties of both overburden and sedimentary rocks to confirm the site conditions and to perform soil-structure interaction analysis if necessary;
- assessment of the effect of the potential settlement on buried infrastructures in the deposits during the design of these infrastructures.

Recommendation # 41 (Section 6.1):
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 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.

Recommendation # 47 (Section 6.7):
The Panel recommends that prior to site preparation, the Canadian Nuclear Safety Commission ensure the OPG Traffic Management Plan addresses the following:
- 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 improvements at the Highway 401/Waverley Road interchange.

Recommendation # 48 (Section 6.7):
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.

During Site Preparation

Recommendation # 19 (Section 5.4):
The Panel recommends that the Canadian Nuclear Safety Commission require OPG to expand the scope of the groundwater monitoring 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.

Prior to Construction

Recommendation # 1 (Section 4.5):
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.

Recommendation # 3 (Section 4.5):
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 should include cooling tower plume abatement technology.

Recommendation # 14 (Section 5.3):
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 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.

Recommendation # 16 (Section 5.3):
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 new nuclear site comply with requirements in the Fisheries Act.

Recommendation # 17 (Section 5.4):
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 wet and dry deposition of all contaminants of potential concern and radiological constituents, especially tritium, in gaseous emissions on groundwater quality.

Recommendation # 26 (Section 5.5):
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 hazardous chemicals on site, in accordance with the Canadian Environmental Protection Act , once a reactor technology has been chosen.

Recommendation # 35 (Section 5.7):
In the event that a once-through condenser cooling system is chosen for the Project, the Panel recommends that prior to operation, the Canadian Nuclear Safety Commission require OPG to include the following in the surface water risk assessment:

- the surface combined thermal and contaminant plume; and
- 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.

If the risk assessment result predicts a potential hazard then the Canadian 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.

Recommendation # 37 (Section 5.7):
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 require OPG to determine the total area of permanent aquatic effects from the following, to properly scale mitigation and scope follow-up monitoring:

- the thermal plume + 2$_{o}$ C above ambient temperature;
- the mixing zone and surface plume contaminants;
- physical displacements from altered lake currents; and
- infill and construction losses and modifications.

Recommendation # 39 (Section 5.9):
The Panel recommends that prior to construction, the Canadian Nuclear Safety Commission require OPG to prepare a contingency plan for the construction, 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 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.

Recommendation # 40 (Section 5.9):
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 system intake that includes the setup of thresholds for further actions; and
- 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.

Recommendation # 52 (Section 6.8):
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. ***[or is not available – GE]***

Recommendation # 53 (Section 6.8):
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. ***[or is not available – GE]***

Recommendation # 57 (Section 7.2):
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.

Recommendation # 58 (Section 7.2):
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.

Recommendation # 63 (Section 8.1):
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.

During Operation

Recommendation # 15 (Section 5.3):
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.

Recommendation # 18 (Section 5.4):
The Panel recommends that based on the groundwater and contaminant transport modelling results, the Canadian Nuclear Safety 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.

Recommendation # 36 (Section 5.7):
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 mitigation measures and verify the predictions of no adverse thermal and physical diffuser jet effects.

Recommendation # 54 (Section 7.1):
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.

Recommendation # 61 (Section 8.1):
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 Over the Life of the Project

Recommendation # 4 (Section 4.6):
The Panel recommends that the Canadian 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.

Recommendation # 11 (Section 5.2):
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.

Recommendation # 43 (Section 6.2):
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.
Recommendation # 56 (Section 7.1):
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.

Fisheries and Oceans Canada

Prior to Construction

Recommendation # 31 (Section 5.7):
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 contour in Lake Ontario.

Recommendation # 32 (Section 5.7):
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 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.
During Construction

Over the Life of the Project

Recommendation # 28 (Section 5.7):
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 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.

Recommendation # 29 (Section 5.7):

The Panel recommends that Fisheries and Oceans Canada require OPG to continue the research element of the proposed Round 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.

Recommendation # 33 (Section 5.7):

The Panel recommends that Fisheries and Oceans Canada require OPG to conduct an impingement and entrainment follow-up program … to confirm the prediction of adverse effects, including 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.

Transport Canada

Prior to Construction

Recommendation # 49 (Section 6.7):

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.

Recommendation # 50 (Section 6.7):

The Panel recommends that prior to construction, Transport Canada require OPG to conduct a risk assessment, jointly with Canadian National Railway, that includes:

- 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 running on the tracks that bisect the Project;
- 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);
- 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
- a critical analysis to confirm that these measures, 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.

Recommendation # 51 (Section 6.7):

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 an increased prohibitive zone. OPG must also develop an adaptive management program, if required, to mitigate potential effects to small watercraft.

Environment Canada

Prior to Site Preparation

Recommendation # 62 (Section 8.1):
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.

During Site Preparation

Recommendation # 24 (Section 5.5):
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.

Prior to Construction

Recommendation # 34 (Section 5.7):
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 modelling is conducted by OPG, taking into account possible future climate change effects. Fisheries and Oceans Canada shall ensure that the results of the modelling 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.

During Operation

Recommendation # 23 (Section 5.5):
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 condenser cooling system.

Health Canada

Over the Life of the Project

Recommendation # 55 (Section 7.1):
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 to identify if there is a need for revision of limits specified in the Radiation Protection Regulations.

The Canadian Environmental Assessment Agency

General

Recommendation # 64 (Section 8.1):
The Panel recommends that the Canadian Environmental Assessment Agency revise the Canadian Environmental Assessment Agency Cumulative Effects Practitioner's Guide to specifically include a consideration of accident and malfunction scenarios.

The Government of Canada

Prior to Construction

Recommendation # 60 (Section 7.3):
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.

Recommendation # 66 (Section 8.5):
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.

Over the Life of the Project

Recommendation # 65 (Section 8.5):
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.

General

Recommendation # 67 (Section 8.5):
The Panel recommends that the Government of Canada provide clear and practical direction on the application of sustainability assessment in environmental assessments for future nuclear projects.

The Government of Ontario

Over the Life of the Project

Recommendation # 44 (Section 6.2):
The Panel recommends that the Government of Ontario take appropriate measures to prevent sensitive and residential development within three kilometres of the site boundary.

Recommendation # 46 (Section 6.3):
Given that a severe accident may have consequences beyond the three and 10-kilometre 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.

Ontario Power Generation

Over the Life of the Project

Recommendation # 42 (Section 6.1):
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 education institutions as well as Aboriginal groups to ensure that such programs would be successful.