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CMD 21-H4.1

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Written submission from Ontario Power Generation Inc.

Mémoire d'Ontario Power Generation Inc.

In the Matter of the

À l'égard de

Darlington New Nuclear Project

Projet de nouvelle centrale nucléaire de Darlington

Application to renew the nuclear power reactor site preparation licence for the Darlington New Nuclear Project

Demande de renouvellement du permis de préparation de l'emplacement d'une centrale nucléaire pour le projet de nouvelle centrale nucléaire de Darlington

Commission Public Hearing

Audience publique de la Commission

June 9-10, 2021

9 et 10 juin 2021

Canada

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OPG
Written Submission

In support of the renewal of Darlington New Nuclear Project's
POWER REACTOR SITE PREPARATION LICENCE

Where a brighter tomorrow begins.

ONTARIO POWER GENERATION

CMD 21-H4.1 PUBLIC HEARING JUNE 9-10, 2021

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Executive Summary

Highlights

- OPG is seeking a 10-year renewal of the DNNP PRSL
- The overall conclusion of the comprehensive site evaluation is that the DNNP site remains suitable for a new nuclear generation facility.
- New nuclear generation at the DNNP site would not pose any unreasonable risk to the public, personnel or environment.

Ontario Power Generation Inc. (OPG) is applying to the Canadian Nuclear Safety Commission (CNSC) for a renewal of the Darlington New Nuclear Project (DNNP) Power Reactor Site Preparation Licence (PRSL). On June 30, 2020, OPG submitted to the CNSC an Application to request the renewal of the DNNP PRSL. The current licence expires on August 17, 2022 and OPG is requesting renewal of the licence for a 10-year term.

OPG is requesting to renew the Licence "as is". There is no requested increase in scope. OPG will ensure the selected reactor technology is within the bounds of the licensing basis for the DNNP PRSL, with detailed demonstration during the subsequent licensing process for the Construction phase of DNNP.

This Commission Member Document (CMD) summarizes the evidence that demonstrates OPG meets all the legal requirements of the Nuclear Safety and Control Act and the associated Regulations, and that OPG continues to be qualified to carry on the licensed activities and makes adequate provisions to protect the health, safety and security of persons and the environment. OPG also maintains national security and measures required to implement international obligations, for the DNNP.

The PRSL continues to be a significant asset for OPG and the Province of Ontario, as it enables the option for future additional low-carbon energy generation capacity in Ontario. The renewal of the licence would support OPG's vision of additional nuclear generation capacity at the Darlington site which would help to ensure reliable nuclear energy remains an important part of Ontario's low-carbon energy mix in the future, in alignment with OPG's Climate Change Strategy. It would also support Canada's goals to reduce climate change impacts by being a springboard for future potential nuclear projects in other jurisdictions.

OPG is proud of the strong safety and operational performance and many significant achievements at its two nuclear generating stations over the past 50 years. This

positive track record is a testament to the diligence and passion for excellence that all OPG personnel are committed to each and every day, in support of the safe and reliable operation of our facilities. OPG is committed to upholding these standards of excellence for any future nuclear generating facility.

OPG is particularly mindful of its social licence and the need to ensure protection of the public and the environment. OPG values the relationships it has with Indigenous communities, the public and stakeholders. OPG's relationship with its host community in the vicinity of DNNP remains strong due to ongoing open engagement and sustainable partnerships with community stakeholders, including government, media, business leaders, educational institutions, interest groups, and community organizations. OPG meets with Indigenous communities on an ongoing basis to provide informational updates, to ensure meaningful engagement and communications.

Figure 1: Nature Walks with Ted

OPG keeps the public and stakeholders informed about DNNP as part of the existing engagement and communications activities for the Darlington Nuclear Generating Station (DNGS). Topics such as station operations, environmental performance, and the status of projects (including DNNP) are communicated through various methods and forums with the goal of ensuring transparent disclosure of our activities. Specific to DNNP, OPG has kept Indigenous communities, the public and stakeholders updated on the status of the project since its inception, prior to the issuance of the initial licence, and continues to make publicly available the relevant documents associated with the DNNP environmental assessment (EA) original licensing process.

The present CMD contains a summary of the information documented in the Application and the information necessary for the Commission to make its decision associated with the licence renewal application. This material will also support members of Indigenous communities, stakeholders and the public in understanding the work undertaken to support the site preparation licence renewal application.

To date, OPG has not initiated any licensed activities under the PRSL and has not selected a reactor technology to be constructed and operated for DNNP. The bounding project scope of DNNP remains unchanged from that OPG submitted in 2009, as described in the "Application for a Licence to Prepare Site for the Future Construction of OPG New Nuclear at Darlington" [R-1], (hereinafter referred to as the "Original Application"). OPG will ensure the selected reactor technology is within the bounds of the licensing basis for the DNNP PRSL, with detailed demonstration of this to be addressed during the subsequent licensing process for the Construction phase of DNNP.

In summary, OPG's PRSL renewal application [R-2] demonstrates that the DNNP site remains suitable for new nuclear generation consistent within the bounding scope of the original licensing basis. OPG respectively requests the Commission approve renewal of OPG's Darlington New Nuclear Project Power Reactor Site Preparation Licence.

The Licence Application and supplementary information to the Application are available to the public on OPG's website, www.opg.com.

1.0 Overview

1.1 Introduction

Ontario Power Generation (OPG) is responsible for approximately half of the electricity generation in the Province of Ontario. It provides low-cost power in a safe, clean, reliable and sustainable manner for the benefit of the people of Ontario and our shareholder, the Province of Ontario.

The Power Reactor Site Preparation Licence (PRSL) is the first in a series of licences required to construct and operate a nuclear generating facility in Canada. The Darlington New Nuclear Project (DNNP) PRSL allows OPG to conduct the site preparation activities for the future construction and operation of a new Nuclear Generating Station (NGS) with a maximum net electrical output of 4800 megawatts (MWe).

OPG is applying to the CNSC for a 10-year renewal of the DNNP PRSL to preserve, for both OPG and its shareholder, the Province of Ontario, the opportunity for future nuclear generation at Darlington.

OPG submitted to the CNSC the "Application for the Renewal of OPG's Darlington New Nuclear Project (DNNP) Nuclear Power Reactor Site Preparation Licence (PRSL)" [R-2] on June 30, 2020.

This Commission Member Document (CMD) summarizes the information provided in the DNNP PRSL Renewal Application [R-2] that demonstrate the DNNP site remains suitable for a new nuclear power plant and that OPG will have the relevant programs and policies in place to ensure adequate provision is made for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

1.2 The Darlington New Nuclear Project

OPG's Darlington Nuclear (DN) site is currently home to the four-unit Darlington Nuclear Generating Station (DNGS) and the Darlington Waste Management Facility (DWMF).

Immediately east of the DNGS on the DN site is an area of the site reserved for future nuclear generation, referred to as the Darlington New Nuclear Project or DNNP. OPG currently holds a Power Reactor Site Preparation Licence (PRSL) for DNNP, issued to OPG by the Canadian Nuclear Safety Commission (CNSC) in 2012.

Figure 2 and Figure 3 provide satellite and aerial photographs of the DNNP site.

OPG's PRSL for the DNNP allows OPG to conduct the site preparation activities for the future construction and operation of a new Nuclear Generating Station (NGS). The project scope described in Section 1.2 of the Original Application remains unchanged [R-1]. For planning purposes, the first reactor is assumed to be in operation by 2028 as described in the DNNP PRSL Renewal Plan [R-3]. A schedule of DNNP milestones and achievements to date is shown in Figure 4.

Figure 2: Satellite View of Darlington Nuclear Site (Red Border) and DNNP Project Site (Green Border)

Figure 3: Aerial View of DNNP Project Site Looking south towards Lake Ontario

To date, OPG has not initiated any licensed activities nor selected a reactor technology for future generation and no Engineering, Procurement and Construction (EPC) Company (or Companies) has been contracted. OPG continues to undertake the activities to maintain the DNNP's PRSL and address the regulatory commitments for DNNP. OPG's efforts have been focused on the collection of information to assist the site specific design activities that will be performed prior to site preparation.

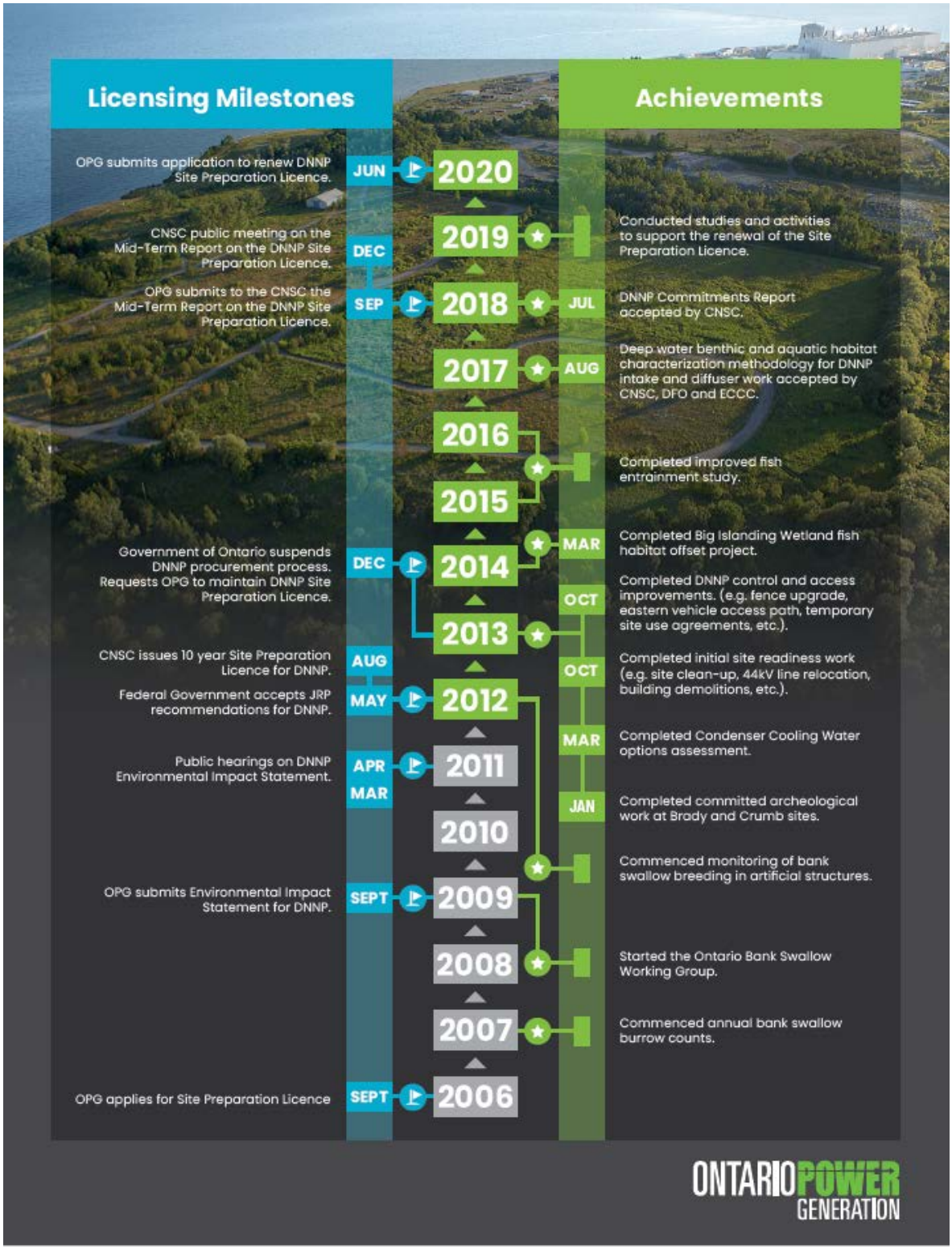

Figure 4: DNNP Licensing Milestones and Achievements

1.3 The Licence Renewal Application

On June 30, 2020, OPG submitted to the CNSC the "Application for Renewal of OPG's Darlington New Nuclear Project (DNNP) Nuclear Power Reactor Site Preparation Licence (PRSL)" [R-2]. The current licence expires on August 17, 2022. However, OPG is applying for an early renewal of the licence with a licence term of 10 years starting from August 18, 2021. This renewal would allow for the project to advance in accordance with OPG's current business planning assumptions for new generation capacity. Renewing the licence early will ensure regulatory certainty for this phase of the project for both OPG and its shareholder, the Province of Ontario, the opportunity for future nuclear generation at the Darlington Nuclear site.

1.4 Key Considerations for Licence Renewal

1.4.1 Performance Highlights from the Current Licence Term

Since 2012, OPG has been maintaining the PRSL and progressing long-lead regulatory commitments such as bank swallow mitigating measures; monitoring the Ontario electricity market; and keeping abreast with emerging advanced nuclear power reactor technologies. OPG has submitted eight DNNP annual reports to the Canadian Nuclear Safety Commission (CNSC) and a midterm licence report in 2018. These reports provided the status and progress of the DNNP activities and the status of the commitments that OPG made in the DNNP EA, during the Joint Review Panel (JRP) hearing and as outlined in the JRP recommendations, which were accepted by the Government of Canada and documented in the "Darlington New Nuclear Project Commitments Report" [R-4]. OPG is progressing on these commitments and their completion is on track per the requirements of the commitments report [R-4].

1.4.2 PRSL Renewal Activities

In support of OPG's "Application for a Licence to Prepare Site", hereinafter referred to as the *Original Application* [R-1], OPG undertook extensive studies, assessments and consultations with various Indigenous communities and stakeholders to complete the site evaluation studies and develop OPG's Environmental Impact Statement (EIS) [R-5], for the DNNP Environmental Assessment (EA). The site evaluation studies concluded that the DNNP site is suitable for a new NGS. The EA was completed and concluded that the project is not likely to cause any significant adverse effects, provided the mitigation measures proposed and the commitments made by OPG [R-4] are implemented. The JRP, consisting of representatives from the CNSC and Canadian Environmental Assessment Agency (CEAA), accepted the DNNP EA.

The CNSC requires site evaluation information to assess the licence application for the facility's lifecycle as part of the Application for a licence to prepare site. In support of the PRSL renewal, OPG completed a review of the DNNP site evaluation in accordance with the DNNP PRSL Renewal Plan [R-3] which addressed the following:

1. Regulatory Document REGDOC-1.1.1, *Site Evaluation and Site Preparation for New Reactor Facilities*, requirements and guidance which included:
    a. Review of Original Application materials [R-1] against REGDOC-1.1.1 requirements and guidance and addressing of identified gaps. It should be noted that the Original Application was prepared according to regulatory document RD-346. REGDOC-1.1.1 superseded RD-346 in 2018 and expanded the scope to include small reactor facilities using a graded approach along with introducing new requirements.
    b. Review of current codes, standards and practices referenced in the licensing basis and those associated with CNSC REGDOC-1.1.1.
    c. Update and review of selected baseline data associated with the site.
2. Indigenous engagement on PRSL renewal.
3. Public engagement on PRSL renewal.
4. Review of the management system that governs site preparation activities.

In addition, Licence Renewal Activity Reports (LRARs) [R-6, R-7, R-10, and R-13], and a Site Selection Threat and Risk Assessment (SSTRA) update were prepared to further support the 10-year licence renewal application. The findings documented in the LRARs (along with the results from items 1 and 4 above) were reviewed and documented in the Aggregate Assessment Report [R-11]. The Aggregate Assessment Report confirmed that the existing licensing basis remains valid for the next licensing period with the mitigating actions which have been added to the DNNP Commitments Report [R-4].

With respect to items 2 and 3, OPG conducted a clause-by-clause review of REGDOC-3.2.1, "Public Information and Disclosure" and REGDOC-3.2.2, "Indigenous Engagement" to ensure compliance of OPG's relevant management system documents with these regulatory documents. The review identified one minor gap with respect to OPG's Nuclear Public Information and Disclosure standard. The relevant documentation and governance has been updated to remove the gap. No gaps were identified with respect to OPG's Indigenous Relations Policy as it related to REGDOC-3.2.2.

2.0 OPG's New Nuclear Vision

Highlights

- New Nuclear is a key part of OPG's Climate Change Action Plan and company-wide target to achieve net-zero carbon emissions by 2040, which in turn supports Provincial and National goals to combat climate change.
- New nuclear ensures reliable, baseload nuclear power remains an important part of Ontario's low-carbon energy mix, complementing the use of renewable energy sources which can be intermittent in their ability to supply energy.
- OPG has the capability to lead the construction and operation of a new nuclear generation facility given its history of more than 50 years of demonstrated safe operation of nuclear facilities and project management success.
- OPG's Darlington NGS and Pickering NGS have recently been recognized for exemplary performance in safety and operating performance by the World Association of Nuclear Operators.
- OPG is currently executing the refurbishment of Darlington NGS's four reactors, one of the largest infrastructure projects in Canada. The refurbishment of Darlington NGS Unit 2 was successfully completed in June 2020 with a strong safety record. Refurbishment of the second reactor (Unit 3) is currently underway.

OPG envisions additional generation capacity at the Darlington Nuclear site to support the continued use of low-carbon nuclear energy in Ontario. Specifically, OPG is exploring innovative nuclear energy technologies with advanced safety features that could help meet Ontario's changing energy needs while combating climate change.

Additional generation capacity at Darlington would:

- Ensure reliable, baseload nuclear power remains an important part of Ontario's low-carbon energy mix (complementing the use of renewable energy sources which can be intermittent in their ability to supply energy);
- Support Provincial and National goals to combat climate change;
- Support the future of the Canadian nuclear industry by providing continued opportunities for industry supply chain companies and promoting direct and

indirect employment (including STEM and other high-tech disciplines, skilled trades);and

- Support OPG's Climate Change Action Plan and company-wide target to achieve net-zero emissions by 2040, as advancement of Small Modular Reactors (SMRs) is a key enabler of this goal.

A key step to realizing this vision is the successful renewal of the PRSL. In parallel, OPG is advancing other important work to support the vision.

In 2020, OPG formally resumed project-planning activities for DNNP, which includes ongoing work with three SMR technology development companies to consider potential options for future on-grid deployment.

Federal and Provincial Government Support for New Nuclear

Both the Federal and Ontario provincial governments have signalled their support for the continued use of nuclear energy in Canada and OPG's plans to advance new nuclear at Darlington.

The Premiers of Ontario, Saskatchewan and New Brunswick have signed a memorandum of understanding (MOU) acknowledging the role of nuclear power as a clean energy source that is essential to fighting climate change. Through the MOU, the provinces committed to work together to advance the development of SMR technologies in their respective provinces and work cooperatively to address key issues that may hinder advancement. Alberta is considering joining the MOU as well.

OPG's shareholder, the Government of Ontario, also continues to support OPG's vision for additional nuclear including the resumption of activities for DNNP. In November 2020, Ontario's Minister of Energy, Northern Development and Mines and Minister of

Indigenous Affairs, joined OPG at the announcement of resumption of DNNP planning activities stating, "Our government is proud to support OPG's efforts to develop cutting-edge SMR technology right here in Durham at the Darlington Nuclear Station by the end of this decade."

The Federal Government has also identified the critical importance of nuclear power in meeting its climate change targets including achieving net-zero emissions by 2050. The Federal Minister of Natural Resources noted in 2020 there is "…no credible path to net zero emissions without nuclear power." The Federal Government's SMR Action Plan, spearheaded by Natural Resources Canada and released in December 2020, reiterates the support for nuclear energy and documents the commitments made by governments, utilities and other stakeholders – including OPG – to advance new nuclear deployment. This includes the important role that OPG's DNNP will play in enabling a pan-Canadian nuclear strategy to help combat climate change.

OPG has not selected a technology developer partner, or reactor design, for DNNP at this time. OPG will ensure the selected reactor technology is within the bounds of the licensing basis for the DNNP PRSL, with detailed demonstration of this to be addressed during the subsequent licensing process for the Construction phase of DNNP.

For planning purposes, OPG envisions the new nuclear facility at DNNP will be in operation by 2028, as described in the DNNP PRSL Renewal Plan [R-3]. An indicative schedule for DNNP, as illustrated in Figure 5, shows approximate timelines for licensed activities associated with this Application.

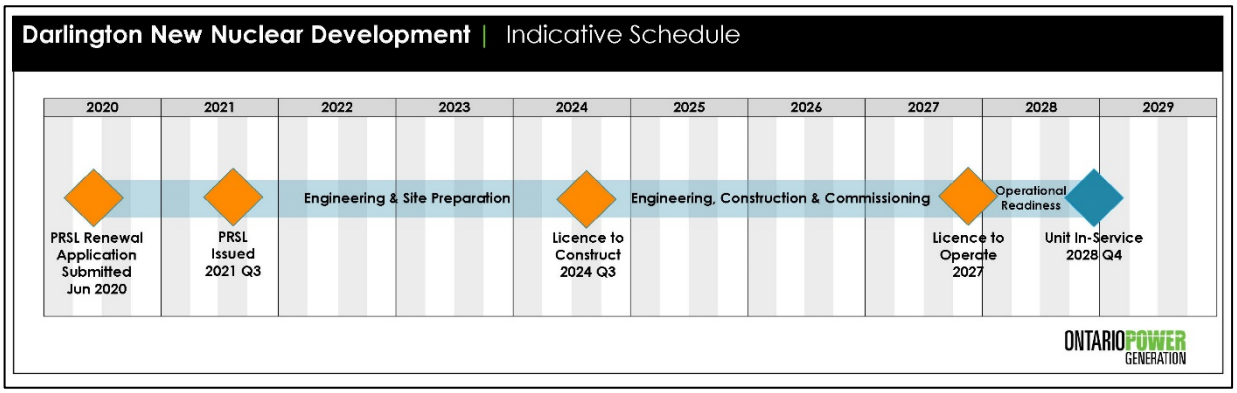

Figure 5: DNNP Indicative Schedule

The above timeline is subject to a decision by OPG and its shareholder, the Province of Ontario, to decide to progress to a formal Project to construct a new nuclear facility, as well as all necessary licensing and regulatory approvals.

OPG's capabilities as an industry leader in safe nuclear operations and project management success continues to be demonstrated by a positive track record of achievements and recognition internationally. This further highlights OPG's capability to not only execute the activities allowed by this licence, but also the readiness to undertake activities to support potential future new nuclear power generation.

- As the largest nuclear power plant operator in Canada, OPG has a demonstrated history of safe operations and project management success which includes 100 years of electricity production and more than 50 years of nuclear operating experience.

- OPG has an extremely strong track record of safe nuclear operations of its existing nuclear generating and waste management facilities. Both the Darlington and Pickering nuclear generating stations have recently been recognized for exemplary performance in safety and operating performance by the World Association of Nuclear Operators, placing them among the top-performing nuclear plants in the world.

- OPG has proven project management capabilities through a track record of project successes, which include successful completion of large hydroelectric projects across Ontario, as well as key nuclear projects. In June 2020, the Darlington Nuclear Refurbishment project achieved one of the most significant milestones in OPG's recent history as Unit 2 was safely and successfully returned to service at 100 per cent full power. This achievement marks the culmination of a decade of planning and more than three years of hard work and dedication on the part of OPG's team and project partners.

- OPG understands the importance of our social licence and works hard to earn and maintain positive and co-operative relations with Indigenous communities and the public. OPG has extensive experience working with Indigenous communities, stakeholders and the local communities surrounding our generating facilities and works continuously to ensure ongoing open and transparent communications.

- OPG continues to be publicly recognized for its strong safety culture. OPG's strong safety performance was recognized with the 2020 CEA President's Award of Excellence for Employee Safety in Generation amongst its peers.

- OPG was recently recognized by the Oshawa Chamber of Commerce with their first-ever Environmental Sustainability Award for ongoing efforts to support sustainability in the local community surrounding the Darlington NGS.

- Long-standing partnerships with various environmental organizations over the years have allowed OPG to plant more than seven million native trees and shrubs and help stock more than five million Atlantic salmon as lead sponsor of the Lake Ontario Atlantic Salmon Restoration Program. OPG's efforts and partnerships in station site communities are consistently recognized by the Wildlife Habitat Council (WHC), an international group that promotes and certifies habitat conservation and management.

3.0 Environmental Risk Assessment

Highlights

- As part of the original DNNP application, OPG's assessments concluded that no residual adverse ecological and human health effects are expected as a result of DNNP activities over the lifecycle of the DNNP facility.

Environmental Risk Assessment (ERA) of a nuclear facility evaluates the risk posed by contaminants and physical stressors in the environment, associated with the facility, on human and ecological receptors. An ERA typically consists an Ecological Risk Assessment (EcoRA) and a Human Health Risk Assessment. OPG completed an EcoRA and an assessment of effects on human health [R-6] for DNNP in support of the original PRSL application [R-1].

The EcoRA includes an assessment of effects on non-human biota from exposure to radiological and non-radiological emissions. The assessment of effects of the DNNP on human health considers the physical, mental, and social well-being of workers and members of the public. The assessments concluded that no residual adverse effects on human health or non-human biota are expected as the result of DNNP activities over the lifecycle of the DNNP facility. This conclusion is confirmed in the Environment LRAR [R-6].

Additionally, an ERA compliant with Canadian Standards Association (CSA) N288.6-12 *Environmental Risk Assessments at Class I Nuclear Facilities and Uranium Mines and Mills* was produced for the DN site in 2016 [R-14], which concluded that the DN site is operating in a manner that is protective of human and ecological receptors residing in the surrounding area. The ERA will be routinely updated in accordance with REGDOC-3.1.1, *Reporting Requirements for Nuclear Power Plants*, and CSA N288.6 to reflect current conditions across DN site. An updated ERA is to be submitted in 2021.

4.0 Site Evaluation

4.1 Introduction

Highlights

- A fulsome review of codes, standards and practices demonstrated that there were no gaps against the Original Application materials and the geological environment remains unchanged.
- A review of potential hazards, human induced events and security considerations concluded that the DNNP site is suitable for all stages of the DNNP life cycle.
- Updated requirements related Canadian climate and air quality standards were assessed and they do not adversely impact the conclusions determined in the Original Application.

A site evaluation process was used to assess the risk of potential hazards to the new Nuclear Generating Station (NGS) and ultimately to the public and the environment. It also assessed the projected performance of the new NGS evaluated against safety goals for the expected conditions at the site.

The site evaluation studies considered the following:

- meteorological events,
- flooding hazards,
- seismic hazards,
- geotechnical hazards,
- external human-induced hazards, and
- hazards related to site characteristics and their influence on potential dispersion of radioactive materials.

Studies looked at radiological releases during normal operations and potential accident conditions, including emergency planning considerations. The assessments considered the entire life cycle of the facility including projections of population growth.

Given that a specific reactor technology had not been selected, a Plant Parameter Envelope (PPE) approach was used to establish a bounding scenario for the site evaluation. This is described in more detail in the next section.

The processes for gathering baseline data and for evaluating natural and human-induced factors that may affect safety and security are described in the PRSL renewal application [R-2].

Based on the evaluation, the results demonstrate that the DNNP site remains a suitable location for the design and construction of a new NGS that will not create an unreasonable risk to the public, personnel or the environment. For each of the hazards evaluated, the risk was determined to be negligible or could be reduced to an acceptable level through design mitigation.

4.2 Plant Parameter Envelope

The Plant Parameter Envelope (PPE) provided a bounding envelope of plant design and site characteristics for use in the DNNP Environmental Assessment (EA) and the Original Application. It relates to the interaction between a nuclear power plant and the site/environment. Site evaluation studies, using the PPE, have confirmed that a new nuclear power plant at the DN site would not pose an unreasonable risk to the public, personnel or environment, and demonstrated that the DNNP site remains suitable for a new nuclear power plant. As part of the renewal process the PPE was reviewed and is consistent with current codes and standards.

When a reactor technology is selected for the DNNP, the design details will be evaluated as per OPG's commitment D-C-3 in the DNNP Commitments Report [R-4].

For further information on the PPE, please refer to Section 4.3 of the DNNP PRSL Renewal Application [R-2].

4.3 Site Characteristics

In support of the Original Application [R-1], OPG provided information on the baseline characteristics of the DNNP site [R-5] [R-13], which concluded that no site characteristics render the DNNP site unsuitable for the future construction and operation of a new nuclear generation.

For each environmental component, the baseline characterization included identification of the Valued Ecosystem Components (VECs) considered relevant for that environmental component. The selected VECs served as endpoints for the assessment of environmental effects for each environmental component and are summarized in the DNNP Environmental Impact Statement [R-5].

What are VECs?

- VECs are features of the environment selected to be the **focus of an EA** because of their **ecological, social, cultural, or economic value** and their potential vulnerability to effects of the project.
- **Support from** the **public**, **stakeholders** and **Indigenous communities** was **received** in order to determine the VECs over the lifetime of the project.

OPG validated the accuracy of the Original Application and supporting documents by conducting reviews against REGDOC-1.1.1 as well as new or revised codes, standards and practices. Where additional baseline data have been collected, the data were evaluated to identify any changes. Changes and updates are documented and addressed in the Environment LRAR [R-6].

A summary of the site characteristics for the DNNP site and any updates based on new requirements or new data is provided in the sections below.

Topography:

The general topography for the DNNP area has not changed from the Original Application documents [R-1].

The DN site is situated in an undulating to moderately rolling limestone till plain bisected by the Canadian National Railway's main line in an east to west direction. The previously irregular terrain was graded in the existing DNGS powerhouse area to an elevation of about 100 m. This site elevation of 100 m is equal to an elevation of +78 masl. The surface elevation rises towards the north with a mean elevation of 122 m just south of the railway tracks and irregular ground from 120 m to 128 m elevation to the north of the tracks. To the east, the site for the DNNP is composed of a gentle slope rising upward from an approximate elevation of 102 m to 112 m over a distance of 400 m. Further east, the existing ground elevations rise substantially to a height of about 130 m near the east site boundary. Figure 6 is a topographic map illustrating the current contours of the DN site as well as existing DN site structures.

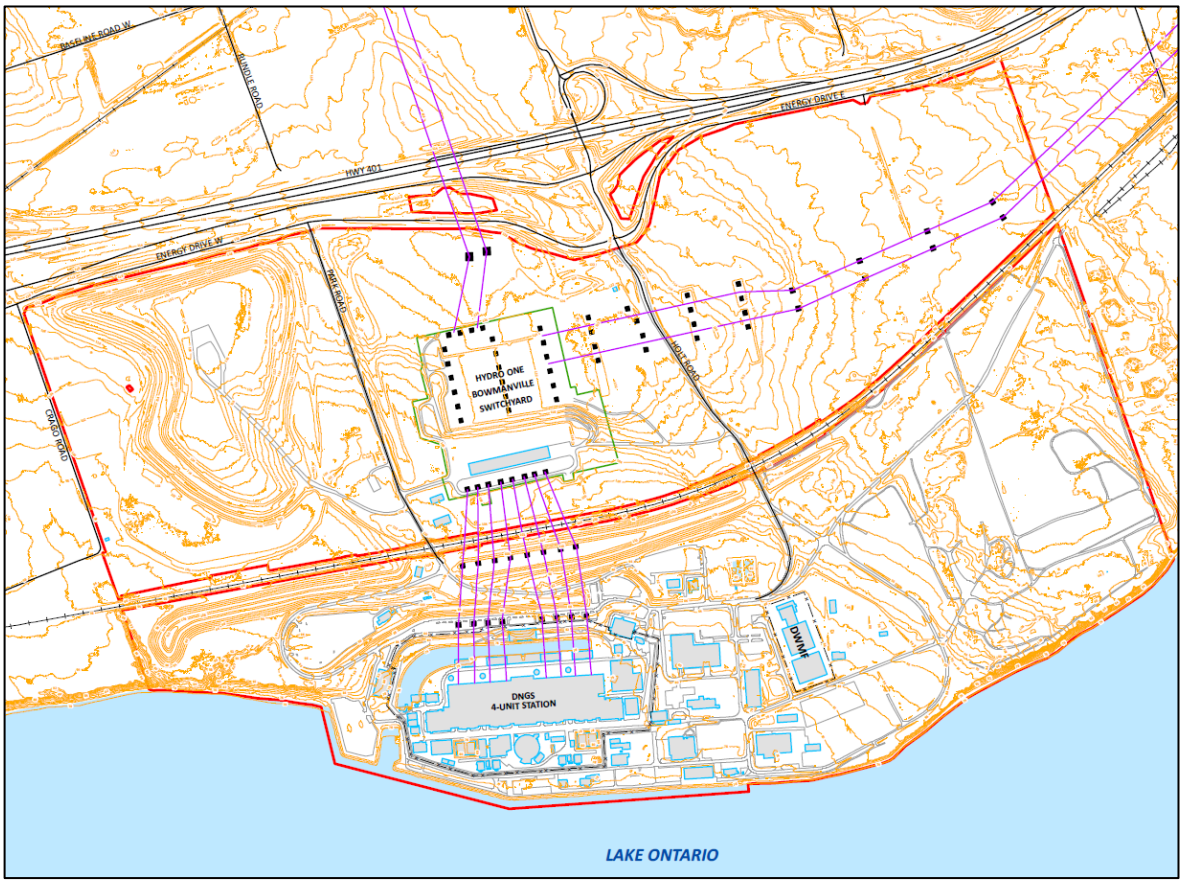

Figure 6: Topographical Map of DN Site

The only notable changes since the Original Application are the reconfiguration of the Holt Road and Highway 401 Interchange, realignment of Energy Drive and changes to adjacent road names. The reconfiguration of the Holt Road/Highway 401 interchange resulted in transfer of 47.5 acres from the original DN site, including approximately 7 acres from the DNNP site, to the Province of Ontario and the Municipality of Clarington for highway and municipal road purposes.

These changes do not impact the conclusions of the original site evaluation. Although road names adjacent to the DN site have changed, the geographic location of the DNNP remains the same. For further details, refer to the licence application [R-2].

Atmospheric and Meteorological Data:

To support the Original Application [R-1], ambient air quality, climate and meteorological conditions in the Local and Regional Study Areas were characterized. Dispersion modelling was conducted to determine the air quality concentrations at specific receptor locations [R-5].

No gaps were identified in the current application's review against REGDOC-1.1.1 with respect to atmospheric and meteorological data. Reviews were carried out against relevant codes, standards and practices. Baseline climate, meteorology and air

quality conditions for the Local and Regional Study Areas were updated in 2019 to progress DNNP commitment D-P-12.2 [R-4]. There were minor differences in 2019 baseline data for air temperature, precipitation, and wind compared to what was reported in the Original Application. These minor differences in meteorological data do not alter the conclusions with respect to the residual adverse effects of the project on the Atmospheric Environment.

Since the Original Application, standards for Particulate Matter ($PM_{2.5}$) have become more restrictive and standards for nitrogen dioxide (NO_2) and sulfur dioxide (SO_2) are expected to become more restrictive in the near future. There have also been changes to air quality standards for polycyclic aromatic hydrocarbon (PAH) and volatile organic compounds (VOCs), which are released due to fuel combustion.

These changes will be addressed as part of the existing DNNP commitment D-P-12.2; OPG will implement an ambient air quality monitoring program and develop an adaptive management program prior to the commencement of site preparation activities. The result will be a program that appropriately addresses the updated standards.

Although reviews against relevant codes, standards and practices have identified minor differences, updated Canadian Climate Normals, revisions to the Provincial air quality standards, and new Canada-wide air quality standards, these changes do not alter the original conclusions regarding residual adverse effects of the project.

Geological and Geophysical Data:

Geology (including structural geology) and geotechnical aspects for DNNP are characterized in the Original Application documents [R-9] [R-10] and remain unchanged.

In summary, the regional and site geology is characterized by upper and lower till layers with predominant glacial deposits between the upper and lower till layers, overlaying bedrock. The glacial deposits are associated with the Oak Ridges Moraine. Further details can be found in the Application for renewal [R-2].

The review of codes, standards and practices against the Original Application materials did not identify any gaps and the geological environment remains unchanged [R-6].

Hydrological Data:

To support the Original Application [R-1], hydrological data, surface water data, and sediment quality data in the Site, Local, and Regional Study Areas were obtained and provided in the Original Application supporting documents [R-5].

No gaps were identified against REGDOC-1.1.1 with respect to hydrological, surface water, and sediment data.

Results of the codes, standards and practices review identified updates to the Canadian Council for Ministers of the Environment (CCME) Canadian Water Quality Guidelines (CWQGs) and Health Canada's Guidelines for Canadian Drinking Water

Quality with some parameters within the guidelines becoming more stringent. However they do not alter any conclusions regarding residual adverse effects of the project. Therefore, there is no impact to the conclusions of the original site evaluation.

Furthermore, some baseline hydrological, surface water quality, and sediment quality components were updated since the Original Application [R-1] to progress DNNP commitments D-P-12.3 and D-P-12.6 [R-4]. These updates to baseline information are provided in the Environment LRAR [R-6].

These baseline hydrological, surface water, and sediment quality updates do not alter the conclusions with respect to residual adverse effects of the project on the surface water environment and the conclusions of the original site evaluation remain valid.

Hydrogeological Data:

For the hydrogeological environment, groundwater flow and groundwater quality were characterized in the Original Application documents [R-1]. A summary of baseline updates and changes to REGDOC-1.1.1 baseline data requirements as well as new or revised codes, standards and practices is provided below.

Groundwater Flow:

Groundwater table flow, intermediate (interglacial deposits) and deep groundwater flow (shallow bedrock) were characterized for the Regional, Local, and Site Study Areas. Vertical groundwater flow within the Site Study Area was also characterized. Groundwater quality within the overburden and bedrock was characterized for the Site Study Area.

Results of the baseline update for groundwater flow concluded that the groundwater flow systems for the Site Study Area are considered to be the same as described in the Original Application documents [R-1]. Generally, groundwater flows from north to south approaching Lake Ontario. Within the northeast extent of Site Study Area, which lies north of the CN railway, inferred groundwater flow is toward the east. General flow patterns within the interglacial deposits and shallow bedrock are similar to the water table and likely also remain unchanged. From the shallow/water table there is a downward vertical hydraulic gradient to the lower interglacial deposits and shallow bedrock.

Through review of information from the monitoring and testing of wells in OPG's existing extensive groundwater monitoring network, it was concluded that the intent of REGDOC-1.1.1 has been met and the original conclusions regarding residual adverse effects of the project and the conclusions of the original site evaluation remain valid [R-1].

Groundwater Quality:

Annual groundwater monitoring has occurred across the Site Study Area since the Original Application. Groundwater quality has been consistent with that documented in support of the Original Application. Groundwater continues to meet applicable guidelines. Results of the codes, standards and practices review identified updates to the Provincial groundwater guidelines for non-potable groundwater in 2011.

The updated groundwater baseline data and updates to provincial groundwater guidelines for non-potable groundwater do not change the conclusions with respect to the residual adverse effects of the project on the hydrogeological environment nor the conclusions of the original site evaluation.

Biological Data

Terrestrial Communities

To support the Original Application [R-1], terrestrial data in the Site, Local, and Regional Study Areas were obtained and provided in the Original Application supporting documents.

REGDOC-1.1.1. requires a description of natural and human-induced pre-existing environmental stresses and the current ecological conditions that indicate such stresses, which has been documented in [R-6]. The existing stressors do not change the residual adverse effects of the project on the terrestrial environment and do not impact the conclusions of the original site evaluation.

Baseline updates were conducted for vegetation, soil, breeding birds, insects, amphibians and reptiles, mammals, landscape connectivity, and species-at-risk (SAR).

The only change requiring an update to commitments (specifically D-P-3.7) pertains to the occurrence of a new Butternut tree (sapling) (Juglans cinereal) (Figure 7), which is a federal and provincial species at risk. This identified Butternut tree was discovered in 2018 and a Butternut Health Assessment found it to be retainable. In the Original Application only one Butternut tree was identified on the DNNP Site Study Area and it was assessed non-retainable as it was severely affected by Butternut Canker. OPG has updated commitment D-P-3.7 to include the new Butternut in site planting plans through the Provincial Endangered Species Act (ESA) Notice of Activity process for new Butternut. With the update to commitment D-P-3.7 to address the new Butternut tree, the updates in the terrestrial baseline will not change the conclusions with respect to residual adverse effects of the project on the environment nor the conclusions of the original site evaluation.

Figure 7: The Butternut Tree (Juglans Cinereal) is a Federal and Provincial Species at Risk

Bank Swallows

Bank Swallows currently nest in the bluffs along the eastern shore of the DN site, in the vicinity of the DNNP lands. As part of a commitment in the DNNP EA, OPG committed to monitor Bank Swallow colonies, develop a mitigation plan that includes provision of artificial Bank Swallow habitat, and undertake research into declining aerial foragers in Ontario with affected stakeholders.

OPG continues to monitor DN site Bank Swallow colonies annually and continues to explore options for artificial nesting structures. OPG has also continued facilitating the collaboration of research on the decline of Bank Swallows with government, non-government organizations, and industry.

The Bank Swallow has become listed as a species at risk (SAR) since the Original Application, therefore any impacts to Bank Swallows will be addressed as part of a provincial ESA permit. The Bank Swallow mitigation listed under commitment D-P-3.8 may need to be revisited in the future to align with the conditions of the ESA permit. OPG continues to conduct regular inventories for breeding birds, amphibians, reptiles, and mammals at the Site Study Area, including targeted surveys for SAR (D-P-12.5) [R-4].

Figure 8: Bank Swallow (Riparia riparia)

Aquatic Communities

To support the Original Application, aquatic data in the Site, Local, and Regional Study Areas were obtained [R-5].

New requirements were identified against three sections of REGDOC-1.1.1 pertaining to baseline aquatic habitat and biota, baseline aquatic food chain data, and the effects of the thermal plume on the aquatic habitat. These have been addressed and documented in the Environment LRAR [R-6]. All but one potential gap has been addressed through existing OPG commitments or the updated aquatic environment baseline. Regarding the remaining potential gap related to specific information to be included on a Fish Habitat Map, the relevant information was gathered and considered during the assessment of project effects and site evaluation. Therefore, the intent of REGDOC-1.1.1 was met and there is no impact to conclusions with respect to residual adverse effects from the project or to the conclusions of the original site evaluation.

The baseline update studies for the aquatic environment demonstrated similar findings as those documented in the Original Application supporting documents and any differences observed are attributed to natural variability. These updates to baseline [R-6] do not alter conclusions with respect to residual adverse effects of the project on the aquatic environment and do not impact the conclusions of the original site evaluation.

Species lists for both the Federal Species at Risk Act (SARA) and ESA have been updated [R-6] since the Original Application. Two fish species, Lake Sturgeon and American Eel, have become listed provincially as a SAR under the ESA. Since any impacts to provincial SAR will be addressed as part of the Provincial ESA permit, the ESA listings of Lake Sturgeon and American Eel do not alter conclusions with respect to

residual adverse effects of the project on the Aquatic Environment and do not impact the conclusions of the original site evaluation [R-6].

Figure 9: Lake Sturgeon
(Image from National Digital Library of the US Fish and Wildlife Service)

Baseline Ambient Radioactivity

Baseline conditions for ambient radioactivity and pre-existing hazardous substances were characterized in the Original Application documents for the Regional, Local and Site Study areas [R-5] and have remained similar to those presented with the Original Application.

The baseline characterization demonstrated that potential doses to members of the public and site workers resulting from the operation of the DN site are very low compared to the allowable regulatory limits of 1 millisievert (mSv) per year for members of the public and non-Nuclear Energy Workers, and 100 mSv per five year period with a maximum of 50 mSv in any one year for Nuclear Energy Workers. Doses resulting from the existing operation of the DN site are a very small fraction of the annual average Canadian background radiation dose of 1.8 mSv. Baseline levels of radionuclides in the environment result in only very small doses to nonhuman biota indicating there are no ecological risks from radionuclides to biota at the DN site[R-5].

Baseline conditions for ambient radioactivity and pre-existing hazardous substances have remained similar to those presented with the Original Application, therefore there is no impact to the conclusions of the original site evaluation.

In addition, the results of the compliance review concluded that there were no gaps against REGDOC-1.1.1 nor other relevant codes, standards or practices related to radiation and radioactivity in the environment [R-8].

Land Use

Although there has been development activity occurring within the Land Use Assessment Zone that has been actively monitored, the development is in keeping with the policies of the municipal Official Plan and does not alter the conclusions reached previously in 2009 with respect to project impacts, specifically considering land use structure and impacts on sensitive land uses in proximity to the DN site. There have been no new sensitive land uses (i.e., nursing homes, day care centres, and educational and health facilities) developed within three kilometres of the Darlington Nuclear Generating Station (DNGS) since monitoring of development in the Land Use Assessment Zone was initiated.

A compliance assessment of DNNP Licence Basis materials against any new or modified requirements in REGDOC-1.1.1, or to applicable current codes and standards, showed no potential gaps identified with respect to Land Use. Further information can be found in the PRSL renewal application [R-2].

As such, the DNNP commitment D-P-12.7 [R-4] related to land use remains valid.

4.4 Assessment of Site Suitability

The DNNP site is suitable for all stages of the DNNP life cycle (construction, operation, refurbishment and decommissioning). This conclusion is based on a review of potential hazards, possible human induced events, and security considerations. A brief summary is provided below. For further details, please refer to the DNNP PRSL renewal application.

Evaluation of Natural External Events

An assessment was performed for any change or impact from natural external events to the conclusion of the 2009 Licence Basis Documents (LBDs) due to changes in codes and standards, and is documented in the Nuclear Safety LRAR [R-7]. Additional insights from the 2020 DNGS hazard screening assessment were also considered [R-1].

The investigation included the following hazards and potential events:

- Climate Change
- Meteorological Hazards
- Surface Water Hazards
- Groundwater Hazards
- Geotechnical and Geophysical Hazards
- Seismic and Geological Hazard
- Biological Hazards
- Natural Fire Hazards

The impact assessment did not result in identification of any new external natural events or hazards.

Evaluation of External, Non-Malevolent, Human-Induced Events

The evaluation of the external and human-induced hazards was updated and compared with the evaluation performed for the Original Application and updated regulatory and guidance documents. There were no changes to the original conclusions captured in the Original Application [R-1]. The evaluation considered the following among the list of potential events:

- Aircraft Crash Events
- Other Transportation Hazards
- Fires and Explosions
- Chemical and Radiological Hazards
- Electromagnetic Interference Hazards

The 2009 Human-Induced External Hazard Assessment in the Original Application [R-1] was compared with the conclusion of the 2020 DNGS Hazard Screening Assessment. As documented in the Aggregate Assessment Report [R-11], it was concluded that no additional analysis needs to be performed and that the conclusion of the 2009 Human-Induced External Events Hazard Assessment in the Original Application [R-1] remains valid.

Conclusion - Assessment of Site Suitability

All the aspects for site suitability have been evaluated with consideration of the full life cycle of a new NGS, and have demonstrated that the DNNP site is suitable for all phases of the DNNP life cycle. For further details on the assessment of site suitability please refer to the PRSL Renewal Application [R-2].

4.5 Exclusion Zone Determination

What is an Exclusion Zone?

Exclusion Zone –"a parcel of land within or surrounding a nuclear facility on which there is no permanent dwelling and over which a licensee has the legal right to exercise control".

Highlights

- Exclusion zone analysis/assumptions and conclusions performed for the most limiting design for the DNNP site in 2009 still remain valid.
- The exclusion zone analysis will be revisited when a reactor technology is selected.

No reactor technology has been selected since the time of the Original Application. The exclusion zone requirements were originally determined on a limiting factor of dose to the public at the nearest boundary to meet the safety goals. Technical information from various reactor designs were used to develop the Plant Parameter Envelope and exclusion zone [R-1]. This information was used to evaluate the suitability of the site for the facility and to assess the environmental effects that the site could have on the facility.

Emergency preparedness, security and environmental considerations were assessed for any new changes or developments for impact on the exclusion zone determination and are discussed in the following sections.

Emergency Preparedness Considerations

Population and emergency preparedness considerations, such as evacuation needs, were considered during the exclusion zone determination. Per the Darlington New Nuclear Project (DNNP) Emergency Preparedness LRAR [R-10], these considerations have not changed and are consistent with those used in the Emergency Preparedness Plan for the DNNP site preparation activities. Refer to the PRSL renewal application [R-2] for more details.

Security Considerations

Security considerations were evaluated for the exclusion zone determination as part of the Original Application [R-1]. These security considerations are not considered a

limiting factor in the exclusion zone determination [R-2]. The preparation of the licence renewal application required assessment activities on areas where incremental impacts may exist in the context of applicable current codes and standards, including any significant changes to the site and study area. The assessment activities demonstrated that the original security considerations for the exclusion zone determination remain valid for the purposes of this Application.

Environmental Consideration

Meteorological factors were evaluated as part of the original PRSL application in the exclusion zone determination. Assessment of the exclusion zone was performed for a generic site using conservative assumptions regarding meteorological conditions. A review of updated environmental data and meteorological data concluded that environmental considerations in the exclusion zone determination still remain valid.

Summary of Exclusion Zone Determination

The Original Application [R-1] stated that the exclusion zone of the operating Darlington NGS covers a portion of the lands for DNNP and extends over the proposed construction site.

Consistent with both the Original Application [R-1] and the DNNP Commitments Report [R-4], OPG will provide the precise location of the proposed exclusion zone and supporting calculations with the Licence to Construct (LTC) application once a technology has been selected. This is in accordance with clause 4.6.1 of REGDOC-1.1.1.

4.6 Overall Site Evaluation Conclusion

Highlights

- The overall conclusion of the comprehensive site evaluation is that the DNNP site remains suitable for a new nuclear generation station.
- A new nuclear generation station at the DNNP site would not pose any unreasonable risk to the public, personnel or environment.

In support of the Original Application [R-1], OPG demonstrated that the DNNP site is a suitable location for the design, construction and operation of new nuclear generation station and will not create an unreasonable risk to the public, personnel or environment. For each of the hazard areas evaluated, the risk was determined to be negligible or could be reduced to an acceptable level through design mitigation.

In support of the PRSL renewal process, OPG has:

- Reviewed the applicable baseline data in view of the potential impact on the facility,
- Evaluated the natural external hazards and external non-malevolent, human-induced hazards' impact on the proposed reactor facility, and potential consequence to people and the environment,
- Reviewed the security threats and issues presented by the geographical location/characteristics of the proposed site.

Furthermore, OPG has also conducted a compliance review of DNNP LBDs against REGDOC 1.1.1, assessed the applicability and impact of the updated baseline data based on the latest DNGS hazard screening assessment, and has identified and addressed any new or updated regulatory documents, codes and standards that apply to site evaluations.

The overall conclusion of the comprehensive site evaluation is that the DNNP site is suitable for a new NGS. The new NGS at the DNNP site would not pose any unreasonable risk to the public, personnel or environment.

5.0 Safety and Control Areas

The following Safety and Control Areas (per RegDoc-1.1.1) are relevant to this Application.

- Management System
- Operating Performance
- Safety Analysis
- Physical Design
- Radiation Protection Measures
- Conventional Health and Safety
- Environmental Protection
- Emergency Management and Fire Protection
- Waste Management
- Security
- Safeguards and Non-Proliferation

5.1 Management System

Highlights

- OPG will utilize the existing Management System developed for its Nuclear Fleet for the purposes of site preparation.
- OPG has reviewed the elements of the existing Management System that would apply to DNNP site preparation activities, and has ensured they remain compliant with up to date regulations, codes, standards and practices.
- OPG may revisit its approach to the Management System for future phases of the project such as the construction phase.

The DNNP-specific management system was based on CSA N286-05, *Management System Requirements for Nuclear Power Plants* and ISO 14000 series of standards, which were the current standards in place at the time of the Original Application. These standards have been updated, and through a detailed review, OPG has made the decision to adopt The OPG Nuclear (OPGN) Management System (currently in place supporting safe and reliable operations for DNGS, PNGS, and OPG's Waste Management facilities) to control the DNNP site preparation activities and relinquish the DNNP specific management system used in the development of the Original Application. The OPG Nuclear Management System OPGN provides a framework that establishes the processes and programs required for OPG to monitor and manage performance against objectives, and fosters a healthy safety culture. The OPGN Management System aligns with the latest regulations, codes, standards and practices, such as CSA standard N286-12, *Management System Requirements for Nuclear Facilities*.

The original DNNP management system was based on older versions of CSA N286-05, *Management System Requirements for Nuclear Power Plants* and the ISO 14000 series of standards in place at the time.

OPG has developed a plan to manage the transition from the DNNP to the OPGN Management System and has notified the CNSC of this plan. OPG will notify the CNSC when activities related to the Management System transition are complete along with any updates to the project license basis documents associated with this change.

DNNP Management System for Future Phases

As the project moves forward into the construction and operation phases, there will be planned decisions in advance of each phase with respect to the management system to be used.

<u>EPC Management System</u>

OPG anticipates that an Engineering, Procurement, and Construction company (EPC Co) will execute Site preparation activities with OPG oversight to ensure all requirements are met.

OPG will review the EPC Co. management system and plans prior to the start of any licensed activities, to confirm that the processes to be used satisfy OPG's requirements. OPG retains ultimate responsibility for the licensed activities under the Nuclear Safety and Control Act and its associated Regulations.

Organization

Figure 10 shows the current organizational structure for the DNNP organization. The organizational structure will continue to evolve as project activities increase and the EPC Company for the project is established

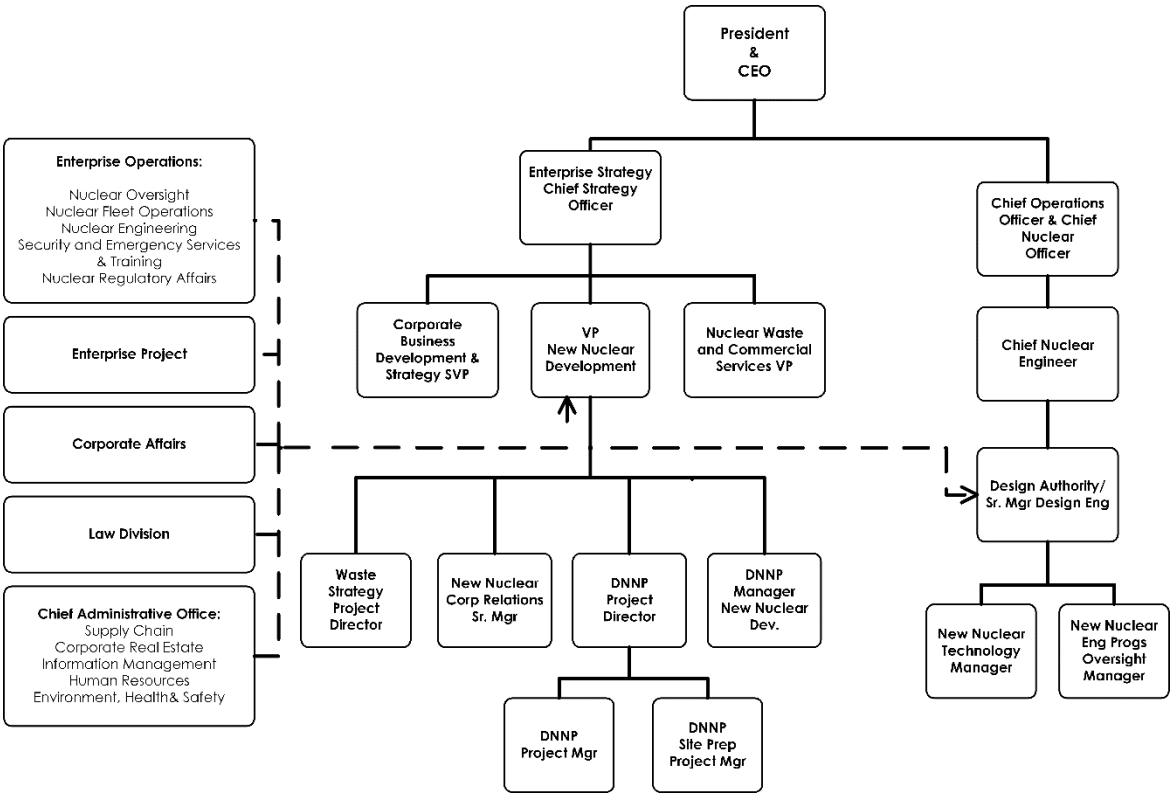

Figure 10: DNNP Site Preparation Organization Chart Overview

5.2 Operating Performance

Highlights

- OPG continues to advance various long lead commitments that are pre-requisites for site preparation licensed activities.
- Review of the licence basis materials has not identified any new risks to health, safety or the environment that would require new mitigation measures.
- Risks and mitigation strategies/measures associated with the health, safety, and environmental effects of licensed site preparation remain valid.

The Operating Performance SCA includes an overall review of the conduct of the licensed site preparation activities and the activities that enable effective performance.

Since the issuance of the PRSL for DNNP, OPG has not commenced any licensed activities under the PRSL on the DNNP site. However, OPG continues to monitor the DNNP site conditions. Adverse and potentially adverse conditions are documented in OPG's Station Conditions Record database. There have been no reportable events related to the DNNP since the issuance of the PRSL.

OPG continues to advance various long lead commitments that are pre-requisites for site preparation licensed activities. They are primarily in the areas of environmental protection and planned confirmatory soil and geotechnical characterization of the site. OPG submits annual reports on site preparation activities as well as progress of commitments to the CNSC in accordance with Licence Condition 4.3 of the LCH. OPG has submitted eight annual reports, the most recent in March of 2020.

Details can be found in the DNNP PRSL Renewal Application [R-2].

5.3 Safety Analysis

Highlights

- Comprehensive safety analysis and hazard screening of Darlington NGS, the results of which are applicable to the DNNP site by proximity, conclude no undue risk to personnel, public or environment.
- As per Commitment D-C-3, a preliminary safety analysis, including hazards related to the site, will be included in the Application for a Licence to Construct (LTC) once a reactor technology is selected.

The Safety Analysis SCA covers the maintenance of the safety analysis that supports the overall safety case for the new nuclear facility. A safety analysis consists of a systematic evaluation of the potential hazards associated with the operation of nuclear reactor. The analysis considers the effectiveness of preventative measures and strategies in reducing the effects of these hazards. Safety analysis work performed for the DNNP PRSL application [R-2] conforms to the requirements of REGDOC-1.1.1.

OPG has prepared licence basis documents that assessed natural external hazards (seismic, meteorological, biological etc.) and human induced hazards (transport accidents, fires, explosions etc.) with respect to their impact on the DNNP site suitability [R-1]. These assessments were compared against modern codes and standards [R-2] and no gaps of any safety significance were identified as a result. The most recent DNGS hazard screening assessment in support of Darlington NGS has been used to support the conclusions of this licence renewal activity [R-7].

The original site evaluation resulted in the creation of the following OPG commitments, which are documented in the DNNP Commitments Report [R-4]. These commitments, to be addressed in subsequent phases, include:

- Commitment D-P-9 and its sub-commitments require OPG to perform additional activities as required by the Site Geotechnical and Seismic Hazard Investigation Program.
- Commitment D-C-3 and its sub-commitments require OPG to perform preliminary safety analysis, which will be performed during the Licence to Construct (LTC) phase of the DNNP site once a reactor design is selected.

More information on the Safety Analysis SCA is available in Section 5.4 of the DNNP PRSL Renewal Application [R-2].

5.4 Physical Design

Highlights

- Evaluations have concluded the existing licensing basis and DNNP commitments, with respect to the physical design of the nuclear facility, remain appropriate for the project scope.
- Prior to the start of site preparation activities, design measures will ensure that EA identified potential effects are addressed.
- A more detailed layout of areas, structures and systems will be defined once the reactor technology has been selected and prior to the start of site preparation activities.

Civil Structures and Civil Works

OPG has not selected a reactor technology, and therefore, has not developed technology specific site layout plans to support definition of the extent of site preparation activities related to major civil structures and works.

The Original Application bounds any site preparation requirements for the technologies under consideration and which OPG may choose in future to proceed, therefore no changes are required to the bounding site preparation scenario.

Figure 6 (in section 4.3) shows the current site topography and Figure 11 shows the bounding site preparation scenario layout. The licensed activities permitted in the PRSL allow the following civil structures and civil works to be conducted during the site preparation phase of the project:

- Construction of site access control measures;
- Clearing and grubbing of vegetation;
- Excavation and grading of the site to a finished elevation of approximately +78 masl;
- Installation of services and utilities (domestic water, fire water, sewage, electrical, communications, natural gas) to service the future nuclear facility;
- Construction of administrative and support buildings inside the future protected area;
- Construction of flood protection and erosion control measures.

Major civil works for the bounding site preparation also include:

- Infilling and associated shoreline protection of Lake Ontario up to the 2 meter depth contour;
- Soil and rock stockpiling on the northern portion of the DNNP site;

- Construction of site access infrastructure (i.e., roads, bridges, water access points).

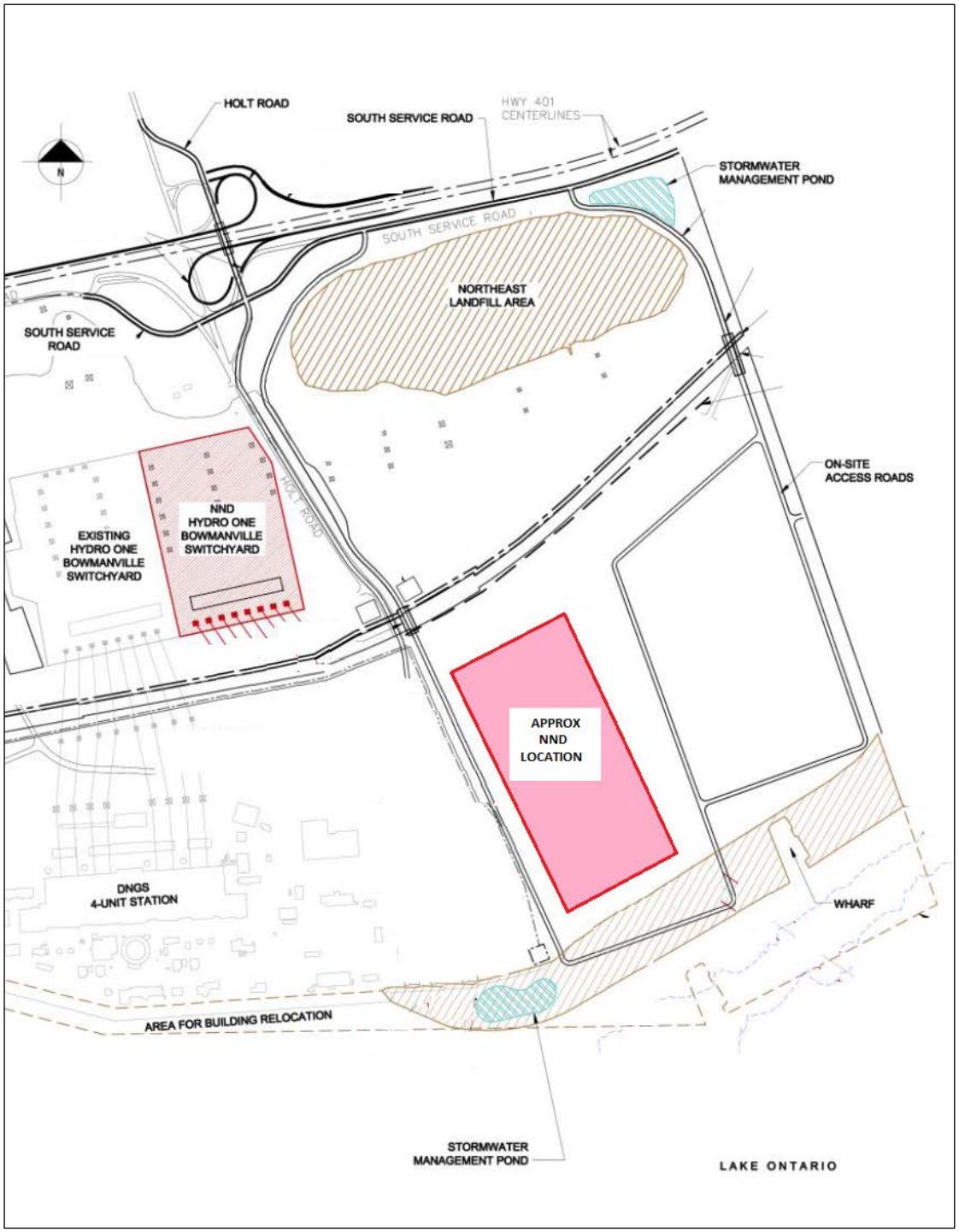

Figure 11: Generic Bounding Site Layout

Specific to lake infilling, commitment D-P-16 in the DNNP Commitments Report [R-4], ensures that adequate lake infill design measures will be undertaken prior to the start of site preparation activities. The lake infill design will ensure that the potential effects

identified in the Environmental Assessment are addressed, and would be provided to the appropriate regulatory agencies as part of the CNSC Licence to Prepare the Site / Authorization processes.

Layout of Areas, Structures, and Systems

The Original Application presented the proposed layout of areas, structures, and systems of the nuclear facility to the extent practicable (See Figure 11). Additionally, OPG has committed to performing a thorough evaluation of site layout opportunities before site preparation begins, per commitments D-P-3.7 and D-P-14.1 in the DNNP Commitments Report [R-4]. The original layout was based on the parameters in the PPE. The parameters represent the largest bounding values for the different reactor technologies evaluated for the Original Application. The PPE is the basis for the proposed layout of areas, structures and systems. Once the reactor technology is chosen, a more detailed layout will be proposed. To formalize this, OPG added a new commitment D-P-18, "Proposed Layout of Structures in the Final Layout State (to the extent practicable)", to the Commitments Report [R-4] as recommended in the Aggregate Assessment Report [R-11].

OPG has undertaken a review of licence basis materials and baseline conditions associated with the DNNP site. The reviews conducted have not identified any new or changed information that would alter the proposed exclusion zone, civil structures and civil works or layout of areas, structures and systems identified in the Original Application. The PPE is the basis for this information and the review of licence basis materials has not identified any changes that impact the PPE. In summary, the existing licensing basis and DNNP commitments, with respect to the physical design of the nuclear facility, remain appropriate for the project scope.

5.5 Radiation Protection

Highlights

- The existing DNNP commitments with respect to Radiation Protection remain appropriate for the project scope for the site preparation phase of the project.
- Workers performing site preparation activities under the renewed licence will not be at risk of receiving radioactive doses exceeding public dose limits, including any background radiation exposure from the proximity of DWMF and DNGS.
- OPG will develop an Occupational Health and Safety Plan to describe methods to collect and interpret DNGS and DWMF perimeter radiation data to verify that doses remain below non-NEW limits.

The Radiation Protection SCA addresses the potential hazards associated with exposure to radioactive substances from past or present nuclear activities, as well as from the use of tools containing radioactive nuclear substances. Radiological hazards may require mitigation to maintain the safety of workers, the environment, and the public.

During site preparation, workers will not be at risk of receiving radioactive doses exceeding public or employee dose limits. There will be no dose of radiation associated with site preparation that would merit an Action Level according to Section 6 of the Radiation Protection Regulations.

Note that contactors may possess tools that contain radioactive nuclear substances, as they would on any conventional building site. These would be licensed under separate source licenses, where the individual contractors would be the licensees.

OPG will develop an Occupational Health and Safety Plan (described in detail in Section 5.6) to describe the processes and methods that will be used to collect and interpret DNGS and DWMF perimeter radiation data and verify that workers involved in DNNP site preparation activities are not receiving doses above non-Nuclear Energy Worker (NEW) limits.

OPG's evaluations have demonstrated that the existing DNNP commitments with respect to Radiation Protection remain appropriate for the project scope for the site preparation phase of the project.

5.6 Conventional Health and Safety

Highlights

- OPG's Health and Safety Program will apply to all OPG personnel and contractor staff supporting the project, and the Occupational Health and Safety Plan will address conventional hazards and potential radiation exposure of workers.
- There have been no occupational health and safety events and no Ministry of Labour investigations or orders related to the DNNP.
- OPG has a demonstrated excellent conventional safety record, as exhibited at our Darlington Refurbishment project and our operating plants.
- The existing DNNP commitments with respect to Conventional Health and Safety remain appropriate for the project scope, and the management system is in compliance with the latest requirements identified with respect to Health and Safety for the site preparation phase.

The Conventional Health and Safety SCA ensures adequate implementation and oversight of a program to manage workplace safety hazards and to protect personnel and equipment.

There have been no occupational health and safety events and no Ministry of Labour investigations or orders related to DNNP.

The Original Application provided the framework for OPG's Health and Safety Program implementation, which will apply to all OPG personnel and contractor staff supporting the project. Following the DNNP Commitments Report [R-4], under commitment D-P-2.1, OPG will develop an Occupational Health and Safety Plan prior to the start of licensed activities to address conventional hazards and potential radiation exposure of workers to ensure compliance with applicable laws and industry best standards.

OPG has found that the existing DNNP commitments, with respect to Conventional Health and Safety, remain appropriate for the project scope, and the management system is in compliance with the latest requirements identified with respect to Health and Safety for the site preparation phase.

5.7 Environmental Protection

Highlights

- OPG will ensure that impacts of the DNNP on the public, workers, and the environment will be of low risk and adequately mitigated.
- OPG has a demonstrated track record of environmental stewardship which will continue for DNNP site preparation licensed activities.

Recognition of OPG's Environmental Stewardship

- OPG Darlington received the 2019 Sustainability Award from the Greater Oshawa Chamber of Commerce which considers a wide range of criteria including business uniqueness and environmental efforts.
- In 2020, OPG Darlington received a gold Wildlife Habitat Council Conservation Certification recognizing the specific efforts of DNGS's biodiversity program which aims to protect and nurture species and their habitats.

The Environmental Protection SCA includes the programs that identify, control and monitor all releases of radioactive and conventional hazardous substances and effects on the environment from facilities or the result of licensed activities. All reasonable precautions are taken to ensure that adequate provisions for the protection of the environment are maintained. Further details on the activities conducted to protect human health and the environment can be found in Section 5.9 of the Licence Application [R-2].

Figure 12: Monarch Butterfly

Existing Licence Basis

The Original Application [R-1] referred to the Environmental Protection Program to address the requirements for site preparation activities as well as the environmental

monitoring and EA follow up plan. OPG will ensure that the site preparation activities, including those conducted by an EPC Company, are performed in a manner that protects the environment through the systematic evaluation of the potential environmental effects associated with all work activities. Implementation of measures that eliminate, manage, reduce, or mitigate the risk, will be done in accordance with an Environmental Management and Protection Plan.

Licence Renewal Updates

As noted earlier, there have been no licensed site preparation activities undertaken for DNNP over the previous licensing period. Since the Original Application, five standards and one regulatory document have been introduced that are relevant to environmental protection during the site preparation phase. These are being addressed in elements of the OPGN Management System transition. A review was performed to determine the level of compliance of programs, procedures, and plans that make up the OPGN Management System to control future site preparation activities. OPG's Environmental Management System Program was found to be already compliant with the requirements of four of the six new documents referenced above. The remaining two documents, CSA N288.7 and N288.8, will be implemented through the broader OPG fleet implementation plan as agreed to by the CNSC.

The environmental performance expectations outlined in the Original Application [R-1] are also applicable to any contractor employees that may be involved in site preparation activities.

5.8 Emergency Management and Fire Protection

Highlights

- OPG has robust emergency preparedness plans integrated with the Province of Ontario, Region of Durham, Municipality of Clarington, and international partners. OPG's current emergency plans will require only minor modifications to accommodate a new NGS.
- Policies, programs and procedures are in place for fire and emergency response and will cover licenced activities under this phase.

The Emergency Management and Fire Protection SCA covers emergency plans and emergency preparedness programs for emergencies and for non-routine conditions.

OPG has robust emergency preparedness plans integrated with the Province of Ontario, Region of Durham, Municipality of Clarington, and international partners. Emergency Preparedness program requirements are outlined in OPG's Consolidated Nuclear Emergency Plan (CNEP), and are aligned with the Provincial Nuclear Emergency Response Plan (PNERP) Master Plan, and the PNERP Implementing Plan for DNGS. The current CNEP will require only minor modifications to accommodate the site preparation phase of new nuclear generation at DNNP.

Figure 13: Emergency Planning

Policies, programs and procedures will be in place for fire prevention, fire notification and immediate response via Clarington Fire Services (CFS) in accordance with National Fire Code of Canada, National Building Code of Canada and other applicable codes, standards and regulations.

Detailed information on this SCA can be found in Section 5.10 of the Licence Renewal Application [R-2]

5.9 Waste Management and Decommissioning

Highlights

- The activities licensed under the PRSL for DNNP do not involve the handling of radioactive materials and will not generate any radioactive wastes.
- The hazardous substances that may be present and/or hazardous wastes generated as a result of site preparation activities will be limited to those utilized during standard construction processes.

In the context of site evaluation and site preparation, the Waste Management SCA covers both nuclear and hazardous substances that are used or produced in the course of carrying on a licensed activity and that may pose a risk to the environment or the health and safety of persons.

Waste Management

There have been no licensed site preparation activities undertaken for DNNP over the previous licensing period. As a result no hazardous wastes have been generated by site preparation activities.

As described in the Original Application [R-1], the activities licensed under the PRSL for DNNP do not involve the handling of radioactive materials and will not generate any radioactive wastes. All site preparation activities will take place outside the existing Protected Areas established on the DN site lands for the DNGS and the DWMF.

A review of DNNP licence basis materials was conducted in the area of Nuclear Waste Management. This did not identify any changes with respect to baseline information or codes, standards and practices that would necessitate an update to licence basis materials previously submitted for nuclear waste management or require new commitments or changes to existing commitments for the site preparation phase of the DNNP.

With respect to non-nuclear waste management, OPG has reviewed the current commitments D-P-3.6 and D-P-3.3 [R-4] regarding the development of a Hazardous Waste Management Plan/Procedure and a Spill Prevention and Response Plan/Procedure respectively, in addition to the results of the Aggregate Assessment in the area of waste management. The review has found that the existing commitments remain appropriate for the project scope with respect to waste management.

Decommissioning

A preliminary decommissioning plan (PDP) for the site preparation phase was developed to describe the decommissioning of the site in the event the project is cancelled after the site has been prepared for construction. Since the PRSL only permits limited physical activities, which does not include work that would require

decommissioning under CSA N294-09, *Decommissioning of Facilities Containing Nuclear Substances*, OPG requested that the decommissioning financial guarantee letter serve in lieu of a more detailed PDP.

OPG has committed to update the PDP for site preparation (commitment D-P-13.1) when OPG applies for authorization to commence site preparation activities to allow more substantive site preparation work. In accordance with Licence Condition 8.2 of the current LCH, review or revision of the PDP is required every five years and OPG has provided the necessary reaffirmation as required, the latest being in December 2017 to the satisfaction of the CNSC.

A PDP for the end-of-life station was presented in Section 12 of the EIS [R-5] to address the life cycle aspects of decommissioning.

A review of DNNP licence basis materials was conducted in the area of Decommissioning in addition to aggregated impacts from the overall review. The two previously submitted PDPs (one for site preparation and one for end-of life) were used as the basis for the review. The review found that existing LBDs are compliant with REGDOC-1.1.1 decommissioning planning requirements and guidance. Therefore, the conclusions of the existing site evaluation with respect to decommissioning remain valid and appropriate for the project scope.

5.10 Security

The OPG Security Program supports OPG's need to manage residual risk to the public created by the operation of its facilities, protect assets and respond to emergencies that may impact operations and the public. Key elements of this program include maintaining compliance with legislative requirements, while minimizing the adverse impact on staff and plant operations. The objective of the program is to establish a state of security readiness to ensure safe and secure operation of OPG stations and facilities.

Elements of OPG's security program will be revised as required to address risk and regulatory requirements associated with the DNNP. Revisions will occur in a phased approach reflecting the stages of the project lifecycle from site preparation, construction, to operations and ultimately decommissioning.

Accountability

OPG's current Emergency Services and Training (ES&T) organization provides security support for all OPG facilities. The Vice-President, ES&T is accountable for the security of all OPG assets. This accountability includes the security program for OPG's planned DNNP, located on the Darlington Nuclear site.

Program Overview

OPG's program ensures the security of OPG's assets through physical and administrative security measures utilizing equipment, personnel, and procedures. The activities authorized under the License to Prepare Site for DNNP have limited nuclear security impact. The security program for the DNNP during the site preparation phase is focused primarily on ensuring that the selected site remains suitable for a new nuclear development from a security perspective, mitigating risk to existing Darlington Nuclear facilities, and protecting prescribed information.

Potential risks are identified and analyzed through the preparation of a Site Specific Threat and Risk Assessment (SSTRA) which considers physical site characteristics that

could impede the development and implementation of future adequate security measures. Additional threat and risk assessments (TRAs) will be conducted at each phase of the project with security measures evaluated against these TRAs to ensure credible threats are mitigated.

OPG has a mature and robust security program in place at the DN site. Details of OPG's Darlington security program are fully described in the DNGS Security Report submitted to the CNSC.

OPG conducted a Nuclear Security Review for DNNP which addressed updates in requirements since the Original Application [R-1]. The review included results of the revised SSTRA, results of a compliance review of security related current codes and standards, and the results of the REGDOC-1.1.1 security requirements and guidance compliance review. The review did not identify any gaps with the requirements of modern codes and standards or REGDOC 1.1.1.

5.11 Safeguards and Non-Proliferation

Highlights

- During site preparation activities there will be no nuclear substances or controlled nuclear components encompassed by the site preparation licence.
- Any construction-related tools used containing radioactive nuclear substances would be licensed under the authority of separate CNSC nuclear substances and radiation devices licences.
- There have been no changes to the DNNP application with regards to the Safeguards and Non-Proliferation SCA over the previous licencing period.

This SCA covers the programs and activities required for implementation of Canada's obligations arising from the Canada/IAEA safeguards agreements as well as other measures arising from the Treaty on the Non-Proliferation of Nuclear Weapons.

Safeguards and non-proliferation measures following Canadian regulations and agreements with the IAEA are set up throughout the station lifecycle, including:

- Monitoring and reporting on nuclear material and activities
- Providing IAEA safeguards inspectors with access to areas where nuclear material is stored, and to specified nuclear-related manufacturing and research activities
- Providing operational and design information for nuclear facilities to the IAEA

It is anticipated that during site preparation activities there may be construction related tools containing radioactive nuclear substances, however these activities will be performed under the authority of separate CNSC nuclear substances and radiation devices licences.

OPG has a Safeguards program N-PROG-RA-0015 and processes in place which are compliant with REGDOC-2.13.2 and cover the following:

- Communication protocol between the International Atomic Energy Agency (IAEA), CNSC and OPG.
- Obligations to meet applicable regulatory requirements and requirements of associated safeguards procedures.
- Reporting to meet applicable regulatory requirements and requirements of safeguards agreements.

For DNNP site preparation phase activities, two requirements of REGDOC 2.13.1 are applicable:

- Annual declaration on general plans for the succeeding 10-year period relevant to the development of the nuclear fuel cycle, including the preparation for new facilities, and
- Complementary access requested by the IAEA for an inspection or design information verification.

OPG would manage these applicable requirements using processes established in OPG safeguards program N-PROG-RA-0015.

As the project progresses to subsequent phases, REGDOC-2.13.1 will be implemented according to the activities involved in that project phase. The existing licensing basis for the DNNP will be updated to include REGDOC-2.13.1.

6.0 Other Matters of Regulatory Interest

6.1 Environmental Assessment

The Government of Canada accepted the JRP recommendations for the DNNP in May 2012, which concluded that the DNNP would not likely cause significant adverse environmental effects.

In 2006, the Government of Ontario directed OPG to initiate the federal approvals process for new nuclear generation at an existing OPG site. A public hearing, conducted by a Joint Review Panel of the Canadian Environmental Assessment Agency and Canadian Nuclear Safety Commission, was held in 2011 to consider the DNNP Environmental Impact Statement and PRSL application. In May 2012, the Government of Canada accepted the JRP recommendations for the DNNP, which concluded that the DNNP would not likely cause significant adverse environmental effects provided that OPG implements the mitigation measures proposed and commitments made during the hearing as well as the JRP's recommendations [R-4].

Since 2012, the DNNP scope and planned activities for site preparation remain unchanged from the Original Application [R-1].

OPG will ensure the selected reactor technology is within the bounds of the licensing basis for the DNNP PRSL, with detailed demonstration of this to be addressed during the subsequent licensing process for the Construction phase of DNNP.

6.2 Public Information and Disclosure Program

Highlights

- OPG commits to continued public and stakeholder communications on the DNNP as an adjunct to the existing program at DNGS.
- Public attitude towards operation of the DNGS station and community support for the DNNP has remained positive throughout the licensing period.
- OPG was pleased to receive positive feedback and support from many stakeholders who shared their enthusiasm for OPG's intention to renew the licence and potential to progress DNNP.

OPG values the relationships it has with Indigenous communities, the public and stakeholders. OPG fosters open and ongoing communications and engagement programs with the public and stakeholders in communities where our facilities are located, as well as with the broader general public.

Figure 14: Indigenous Traditions activities at DNGS

OPG has kept the public and stakeholders informed about DNNP as part of the existing engagement and Communications activities for the DNGS. Topics such as station operations, environmental performance, and the status of projects (like DNNP) are communicated through various methods and forums with the goal of ensuring transparent disclosure of activities through public engagement.

OPG's Corporate Affairs organization adheres to the principles and process for external communications as governed by the appropriate governance N-STD-AS-0013, *Nuclear Public Information and Disclosure*. This document guides OPG's external community stakeholder activities, public response requirements of issues or significant events, and OPG's standards to respond to the public. OPG's nuclear public information disclosure protocol is posted to our public website: *www.opg.com.*

OPG's community relations and public information program has been recognized as a strength by national and international utility peers. OPG benchmarks current practices amongst other industries to ensure continuous performance improvement. OPG's relationship with its host community remains strong due to ongoing open engagement and sustainable partnerships with community stakeholders, including government, media, business leaders, educational institutions, interest groups, and community organizations.

Communications and Consultation – Darlington New Nuclear Project

Beginning in 2006, OPG undertook a comprehensive outreach and communications program with stakeholders and the public to support OPG's initial application for a PRSL and in support of the project EA, including the public hearing to consider OPG's environmental impact statement and licence application, and subsequent issuance of the licence in 2012.

Figure 15: Public Open House

This program built on the communications and stakeholder relations program in place at DNGS, which has been in existence for many years and meets or exceeds all regulatory requirements. Where necessary, the program was augmented to include

activities and/or stakeholders potentially interested in DNNP, but not usually within the scope of the DNGS program.

Since the licence was granted in 2012, OPG has continued to inform the public and stakeholders about the status of DNNP as an adjunct to the existing DNGS public information program, through various methods and forums, including (but not limited to):

- Information Sharing: fully-staffed DNGS public information centre; information on OPG's public website www.opg.com; a toll-free information line; social media platforms (Facebook, Twitter, and Instagram).
- Community Outreach: briefings with key stakeholder groups, elected officials and municipal representatives; presentations and site bus tours of the DN site (including the DNNP lands) to community groups, key stakeholders, industry partners and the general public; the quarterly Neighbours Newsletter for the DNGS, distributed to about 120,000 residents and businesses within ten kilometers of the DN site and posted online; a DNNP booth and information available at the station's annual public open house, which in recent years has drawn approximately 3,000 people each year.
- Community Committees (regular updates to established local community committees including the Darlington Community Advisory Council, Pickering Nuclear Community Advisory Council, Durham Nuclear Health Committee), Clarington Board of Trade and Office of Economic Development).

Intent to Renew PRSL

As part of the preparation of the PRSL renewal Application, OPG undertook activities in order to confirm the local community's confidence in OPG and found that general feelings of personal health, safety and community satisfaction had not changed significantly since submission of the Original Application.

After OPG made the decision to apply for PRSL renewal, it also began sharing this intent with Indigenous communities, stakeholders and the public, through the following methods:

- In the August 2018 PRSL mid-term licence report, which was submitted to the CNSC, posted to OPG's public website (www.opg.com) and discussed at the CNSC's public meeting to consider the report
- As part of regular, ongoing Indigenous community and stakeholder briefings
- In OPG's Neighbours community newsletter, including the Fall 2018 and subsequent editions subsequent editions

OPG continued communicating licence renewal plans through various activities leading up to the submission of the Application in June 2020, including the launch of a new page on OPG's public website, dedicated to DNNP and the licence renewal, which provides access to present and historical EA, licensing and associated documents that may be of interest to the public.

Outreach and Communications since Licence Application Submission

Since the submission of the Application, OPG has undertaken a comprehensive outreach and communications program including activities designed to reach a broad audience of stakeholders and the public to ensure they are well informed about DNNP, including the following:

- Sharing historical information about the accepted EA, its findings and OPG's commitments made as part of that process;
- Activities that have taken place on the DNNP site and in support of the licence since it was granted;
- OPG's intent to renew the licence and vision for the future of the DNNP site;
- Studies undertaken to support the licence renewal application (i.e., updates to baseline information, etc.);
- Opportunities for the public to be involved in the CNSC's licence hearing process; and
- To provide forums to discuss key topics of public interest related to the licence application and renewal.

OPG is preparing to further increase communication and engagement activities particular to the DNNP project, should a decision be made to proceed to a project and site preparation activities.

6.3 Indigenous Engagement Update

Highlights

- OPG is regularly engaged with the identified Indigenous communities on all aspects of the PRSL Renewal and is respectful of their treaty rights and/or interests under Section 35 of the Constitution Act, 1982.
- OPG understands the priority expectations of the identified communities regarding the protection of the natural environment, nuclear safety and respectful, meaningful engagement/consultation.
- OPG will find ways to respectfully showcase the Indigenous history of the project site.

OPG acknowledges the Aboriginal and Treaty Rights of Indigenous communities as recognized in the Constitution Act, 1982. Under its Indigenous Relations Policy, OPG has engaged with the identified Indigenous communities having established or asserted rights and/or interests in the vicinity of the Darlington New Nuclear Project. These communities include:

- Williams Treaties First Nations
    - Beausoleil First Nation
    - Chippewas of Rama First Nation
    - Chippewas of Georgina Island
    - Mississaugas of Scugog Island
    - Hiawatha First Nation
    - Curve Lake First Nation
    - Alderville First Nation
- Mohawks of the Bay of Quinte
- Métis Nation of Ontario, Region 8

Indigenous engagement regarding DNNP has been extensive, starting in 2006 with a Project Commencement Notification Letter and Invitation to a Community Information Session. The information sharing sessions began in 2007 with Indigenous community contacts, which led to the Aboriginal Interests Technical Support Document in 2009.

Further engagement was held in 2010 which explained the purpose of the project archaeological excavation and findings, as well as understanding the traditional land use of the area to complement the EA. The Indigenous communities engaged during the EA were members of the Williams Treaties First Nations (Curve Lake, Alderville) and

Mississaugas of New Credit. Additionally, the Métis Nation of Ontario, represented locally by Region 8 (an area encompassing Durham to Guelph), were engaged separately and undertook a traditional land use study funded by OPG as a referral document to help inform the EA. OPG also engaged with the Mohawks of the Bay of Quinte.

Through the Technical Support Document and EA process, OPG was able to demonstrate that no treaty or Aboriginal rights, lands or areas of interest were negatively affected by planned project activities.

Since August of 2012, OPG has enhanced its relationship with local Indigenous communities regarding nuclear operations and projects. OPG has reported on and also invited Indigenous communities to participate in the environmental monitoring process for both PNGS and DNGS, particularly with the Williams Treaties First Nations, which are proximate to Pickering and Darlington nuclear generating stations. Additionally, tours of the DNNP site were offered to the Indigenous communities.

Issues and concerns related by community representatives to date include potential salt run-offs from roads into the water from the Project site, wildlife monitoring, animal access to lands, availability of environment reporting specific to the Project site, and OPG's ability to account for climate change and seismic events within its Project plans. These issues and concerns have been dispositioned by OPG.

In addition, Indigenous communities have expressed concern about the current and future storage of nuclear waste and used fuel. OPG arranged for a presentation with representatives from its Nuclear Waste Management unit to discuss how the nuclear waste is processed and transported, and connected community representatives with the Nuclear Waste Management Organization (NWMO) to better understand the long-term plan for the storage of used fuel.

Overall, guidance from the communities has focused on the protection of the natural environment, nuclear safety and the need for ongoing, respectful, meaningful engagement/consultation.

Another topic is the disposition of Indigenous artifacts uncovered during the original EA. OPG has liaised between the Williams Treaties First Nations and the Ministry of Heritage, Sport, Tourism and Culture Industries for the repatriation of the items for their curation and display at Curve Lake First Nation. Eventually, OPG and Curve Lake will collaborate to rotate the artifacts at the planned Darlington Campus Building as part of OPG's recognition of the location's Indigenous history.

In 2018, OPG launched its Indigenous Opportunities in Nuclear (ION) program in order to place Indigenous people in the building trades in co-operation with OPG partnering unions and vendors using the Darlington Refurbishment as a catalyst. Further, OPG is working with Kagita Mikam Aboriginal Employment and Training as a strategic partner and the organization provides candidates from an extensive network including the Indigenous communities described herein. Since 2018, 42 Indigenous people have been placed as civil maintainers, radiation protection technicians, carpenters, millwrights, as well as roles in human resources and project management.

The activities undertaken to date have met or exceeded the requirements outlined in CNSC REGDOC 3.2.2, Indigenous Engagement.

6.4 Intergovernmental Consultation

Highlights

OPG continues to engage and consult with various government agencies that have interest in OPG commitments to obtain their input and/or concurrence with OPG's proposed plans to address them.

During the original EA and licensing process for the DNNP PRSL, OPG had consultations and engagement with various levels of government at the Federal, Provincial and Municipal levels.

As the project was not anticipated to have impacts in other national jurisdictions, further consultation or engagement with other national governments was not deemed necessary. Following the EA process, the Government of Canada accepted a number of recommendations made by the JRP. These recommendations were directed to OPG and various levels of government as shown in Appendix D of the current LCH. These recommendations have been integrated into the DNNP Commitments Report [R-4] as commitments.

Since OPG has an interest in the outcomes of recommendations assigned to other government bodies and agencies, OPG has monitored their progress and/or offered support to progress them such as:

- Participating in the discussions of the Public Policy Statement on land use for the Region of Durham, City of Oshawa and Municipality of Clarington to ensure land use compatibility between sensitive land uses and major facilities, including electricity generation facilities.
- Assisted the Government of Ontario in their updating of the emergency planning zones and emergency preparedness and response measures, as defined in the PNERP Master Plan and PNERP Implementing Plan for DNGS.
- OPG participated in coordinated efforts along with Federal, Provincial and Municipal transport authorities to plan and complete road development, modifications and construct a new interchange at Holt Road and the extension of Highway 407 through Durham Region including the 10 km link (Highway 418) from Highway 401 to Highway 407, immediately west of the DNGS site.
- 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.

To progress OPG commitments for the DNNP, OPG continues to engage or consult with various government agencies that have interest in respective commitments to obtain their input and/or concurrence with OPG's proposed plans to address them. Since 2012, OPG has been involved in the following discussions:

- Consultation with the Department of Fisheries and Oceans Canada (DFO) and Quinte Conservation for the Fish Habitat Compensation Program;
- Consultations with DFO, Environment and Climate Change Canada (ECCC), and CNSC for DNNP Siting Methodology for Intake and Diffuser;
- Consultation with DFO, Ministry of Natural Resources and Forestry (MNRF), ECCC, and CNSC for the Round Whitefish Action Plan; and
- Consultation with ECCC, CNSC, Ministry of Environment Conservation and Parks, Central Lake Ontario Conservation Authority, and MNRF for Bank Swallow Mitigation.
- OPG worked with government bodies and industry stakeholders and chaired the CSA technical committee leading to the development of Canada's nuclear emergency management standard (CSA N1600).
- OPG continues to participate as an active member of the CNSC led, KI Working Group to review requirements for the distribution of KI (potassium iodide) within emergency planning zones.

6.5 Financial Guarantees

Highlights

- A financial guarantee is required to ensure adequate provisions are available for decommissioning of activities licensed by the CNSC.
- The level of work being completed in the site preparation phase is minimal and the cost of any decommissioning at this point can be covered by the ongoing revenue of OPG.
- Should the level of work to be completed change, OPG would propose an appropriate financial guarantee commensurate with the estimate of the decommissioning activities

Should the project be cancelled during the course of the proposed licence, OPG would use the DNNP site to support the ongoing operation of the existing Darlington NGS and maintain the site in accordance with that usage, without specific risks or hazards. OPG has established guarantees for Darlington NGS that include decommissioning of that site.

If OPG applies for authorization to conduct more substantive site preparation work, OPG would propose an appropriate financial guarantee in accordance with CNSC Regulatory Document REGDOC-3.3.1 that is commensurate with the cost estimate of the decommissioning activities. This is consistent with the OPG commitment as communicated in DNNP Commitments Report [R-4].

6.6 DNNP Commitments

Highlights

- All OPG commitments made as part of the DNNP EA and resulting from the Joint Review Panel hearing and recommendations are captured in the DNNP Commitments Report.
- The DNNP Commitments Report is continually being updated as commitments are progressed. Revision 6 of the report has been submitted to the CNSC in February 2021.

OPG made a number of commitments during the EA and the PRSL licensing process. These commitments were integrated with the JRP recommendations and captured in the DNNP Commitments Report, which has been accepted by CNSC.

These commitments are organized into three project phases: site preparation, construction, and operation. They are tracked and reviewed regularly, and updated as appropriate, as part of the DNNP annual reporting to CNSC.

Table 1 provides a summary of the status of commitments for the site preparation phase. Several long lead time commitments have been progressed since the project was deferred in 2013.

Table 1: Status of Existing Commitments for Site Preparation

Commitment #	Deliverable Title	Status
D-P-1	DNNP Management System and Implementing Documents	D-P-1.1 to D-P-1.22: Active D-P-1.23 Complete.
D-P-2	EPC Occupational Health and Safety Plan	Not yet required.
D-P-3	EPC Environmental Management and Protection Plans	Active.
D-P-4	EPC Quality Management Plan	Not yet required.
D-P-5	Emergency Management and Fire Protection Plans	Not yet required.
D-P-6	Personnel Training Plan	Not yet required.
D-P-7	Site Security Plan	Not yet required.
D-P-8	EPC Level 1 and Level 2 Project Management Schedule	Not yet required.
D-P-9	EPC Site Geotechnical and Seismic Hazard Investigation Program	Not yet required, some supporting work completed.
D-P-10	EPC Traffic Management Plan	Not yet required, some supporting work completed.
D-P-11	Archaeological Excavation Reports	Complete.
D-P-12	Environmental Monitoring and Environmental Assessment Follow-up	Active.
D-P-13	Preliminary Decommissioning Plan and Financial Guarantee	Active

Commitment #	Deliverable Title	Status
D-P-14	Fish Habitat Compensation Plan	Active
D-P-15	Round Whitefish Action Plan	Active
D-P-16	Lake Infill Design	Not yet required
D-P-17	Communications, Consultation and Stakeholder Relations Program	Active
D-P-18	Proposed Layout of the Nuclear Facility	Not yet required

One new commitment to capture site layout information was added and two commitments were updated to incorporate the recommendations from the Aggregate Assessment Report [R-11] created as of a part of the licence renewal process. The final report found that most of the existing commitments remain valid and appropriate for the project scope. There were recommended improvements to two existing commitments as well as the addition of a new commitment to capture site layout information. These changes were first included in Revision 4 of the DNNP Commitments Report, which was been submitted to CNSC on June 29, 2020.

7.0 Overall Conclusion

The DNNP site evaluation and licence application has been reviewed against applicable regulatory requirements, current codes, standards and practices as well as current site baseline data. While changes have been identified and assessed, their resulting impacts are not significant and do not alter the previous conclusion on the suitability of the DNNP site for a new NGS. As such, the DNNP site remains suitable for a new nuclear generation and OPG's site preparation licenced activities would not pose any unreasonable risk to the public, personnel or environment.

The PRSL continues to be a significant asset for OPG and the Province of Ontario, as it enables the option for future additional low-carbon, reliable nuclear base-load generation capacity in the Province of Ontario. The renewal of the licence supports OPG's vision of additional nuclear generation capacity at the Darlington site which would ensure reliable nuclear energy remains an important part of Ontario's low-carbon energy mix in the future. It also supports Canada's goals to reduce climate change impacts by being a springboard for future nuclear projects in other jurisdictions.

OPG is requesting to renew the PRSL for another 10 years to allow for the project to advance in accordance with OPG's current business planning assumptions for new generation capacity.

As demonstrated in this Application, OPG:

(a) Is qualified to carry on the activity to be licensed; and
(b) Will, in carrying on that activity, make adequate provision for the protection of the environment, the health and safety of persons and the maintenance of national security and measures required to implement international obligations to which Canada has agreed.

8.0 References

[R-1] OPG Letter, “OPG New Nuclear at Darlington Project – Application for a Licence to Prepare Site”, CD# NK054-CORR-00531-00035, September 2009.

[R-2] OPG Letter, “Application for Renewal of OPG’s Darlington New Nuclear Project (DNNP) Nuclear Power Reactor Site Preparation Licence (PRSL)”, CD# NK054-CORR-00531-10533, June 2020.

[R-3] OPG Plan, "Darlington New Nuclear Project Power Reactor Site Preparation Licence Renewal Plan", CD# NK054-PLAN-01210-00004-R001, October 2019.

[R-4] OPG Report, “Darlington New Nuclear Project Commitments Report”, CD# NK054-REP-01210-00078, November 2020.

[R-5] OPG Report, "Environmental Impact Statement New Nuclear - Darlington Environmental Assessment", CD# NK054-REP-07730-00029-R000, September 2009.

[R-6] OPG Report, "DNNP - Site Preparation Licence Renewal Activity Report – Environment", CD# NK054-REP-01210-00110 R001, May 2020.

[R-7] OPG Report, “DNNP-Site Preparation Licence Renewal Nuclear Safety Activity Report”, CD# NK054-REP-01210-00108, September 2019.

[R-8] OPG Report, “Atmospheric Environment Assessment of Environmental Effects Technical Support Document New Nuclear - Darlington Environmental Assessment”, CD# NK054-REP-07730-00011, September 2009.

[R-9] OPG Report, “Site Evaluation of the OPG New Nuclear at Darlington- Part 3: Summary of Seismic Hazard Evaluations”, CD# NK054-REP-01210-00015-R001, September 2009.

[R-10] OPG Report, “DNNP - Site Preparation Licence Renewal Activity Report – Emergency Preparedness”, CD# NK054-REP-01210-00107, November 2019.

[R-11] OPG Report, “Aggregate Assessment Report for the Darlington New Nuclear Project Power Reactor Site Preparation Licence Renewal”, CD# NK054-REP-01210-00116, June 2020.

[R-12] OPG Report, “Site Evaluation of the OPG New Nuclear at Darlington – Nuclear Safety Considerations”, CD# NK054-REP-01210-00008 R001, September 2009.

[R-13] OPG Report, “DNNP - Site Preparation Licence Renewal Activity Report - Land Use”, CD# NK054-REP-01210-00112, November 2019.

[R-14] OPG Report, "Darlington Nuclear Environmental Risk Assessment", CD# NK38-REP-07701-00001, Nov 2016.

Glossary

Emergency Planning Zone - the area outside the licensee's exclusion zone where implementation of operational and protective actions might be required during a nuclear emergency to protect public health, safety, and the environment. Emergency measures are normally controlled and executed by an external emergency planning authority.

Exclusion Zone -A parcel of land within or surrounding a nuclear facility on which there is no permanent dwelling and over which a licensee has the legal authority to exercise control.

Management System - A framework of processes and programs required to ensure an organization achieves its safety objectives, continuously monitors its performance against these objectives, and fosters a healthy safety culture.

PPE (Plant Parameters Envelope) -The PPE is a listing of values that can be used in the EA and license applications to assist in predicting the potential safety and environmental effects of a nuclear generating station at a particular site.

Acronyms

CNSC - Canadian Nuclear Safety Commission

CSA - Canadian Standards Association

CNEP - Consolidated Nuclear Emergency Plan

DN - Darlington Nuclear

DNGS - Darlington Nuclear Generating Station

DNNP - Darlington New Nuclear Project

DWMF - Darlington Waste Management Facility

EA - Environmental Assessment

ECCC - Environment and Climate Change Canada

EcoRA - Ecological Risk Assessment

EIS - Environmental Impact Statement

EPC - Engineering, Procurement and Construction

ERA - Environmental Risk Assessment

ESA - Endangered Species Act

IAEA - International Atomic Energy Agency

JRP - Joint Review Panel

LBD - Licence Basis Document

LCH - Licence Conditions Handbook

LRAR - Licence Renewal Activity Report

LTC - Licence to Construct

masl - Metres Above Sea Level

mSv - millisievert

MWe - megawatt electric

NGS - Nuclear Generating Station

NWMO - Nuclear Waste Management Organization

OPG - Ontario Power Generation Inc.

OPGN - Ontario Power Generation Nuclear

PAH - Polycyclic Aromatic Hydrocarbon

PDP - Preliminary Decommissioning Plan

PNGS - Pickering Nuclear Generating Station

PNERP - Provincial Nuclear Emergency Response Plan

PPE - Plant Parameter Envelope

PRSL - Power Reactor Site Preparation Licence

REGDOC - Regulatory Document

SAR - Species-at-Risk

SARA - Species at Risk Act

SCA - Safety and Control Area

SSTRA - Site Selection Threat and Risk Assessment

STEM – Science Technology Engineering and Mathematics

VEC - Valued Ecosystem Components

VOC - Volatile Organic Compound