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# Written submission from Canadian Nuclear Laboratories Ltd.

# Mémoire des Laboratoires Nucléaires Canadiens Ltée

In the Matter of the

À l'égard de

**Canadian Nuclear Laboratories, Douglas Point Waste Facility**

**Les Laboratoires Nucléaires Canadiens, installation de gestion des déchets de Douglas Point**

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Application to amend the waste facility decommissioning licence for the Douglas Point Waste Facility

Demande de modification du permis de déclassement de l'installation de gestion des déchets de Douglas Point

**Commission Public Hearing**

**Audience publique de la Commission**

**November 25-26, 2020**

**25 et 26 novembre 2020**

Canada

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Canadian Nuclear Laboratories | Laboratoires Nucléaires Canadiens

# Commission Member Document for Licensing Decisions

## Douglas Point Waste Facility Licence Amendment

## Canadian Nuclear Laboratories

## CMD 20-H4.1

## 22-508760-130-000

## Public Hearing

## Scheduled for 2020 November 25 and 26

## Revision 0

2020 September

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ILLIMITÉE

## EXECUTIVE SUMMARY

This Commission Member Document (CMD) is presented to the Canadian Nuclear Safety Commission (CNSC) Secretariat, in support of an application from Canadian Nuclear Laboratories Limited (hereafter CNL) to amend the Decommissioning Waste Facility Licence of Douglas Point Waste Facility (DPWF), located on the Bruce site on the east shore of Lake Huron in the Province of Ontario. The DPWF is owned by Atomic Energy of Canada Limited (AECL), a federal Crown corporation, and managed by CNL. The DPWF consists of the permanently shut down, partially-decommissioned prototype CANDU (CANada Deuterium Uranium) reactor and associated buildings, structures, and ancillaries. The DPWF has been in Storage with Surveillance (SWS) for more than three decades.

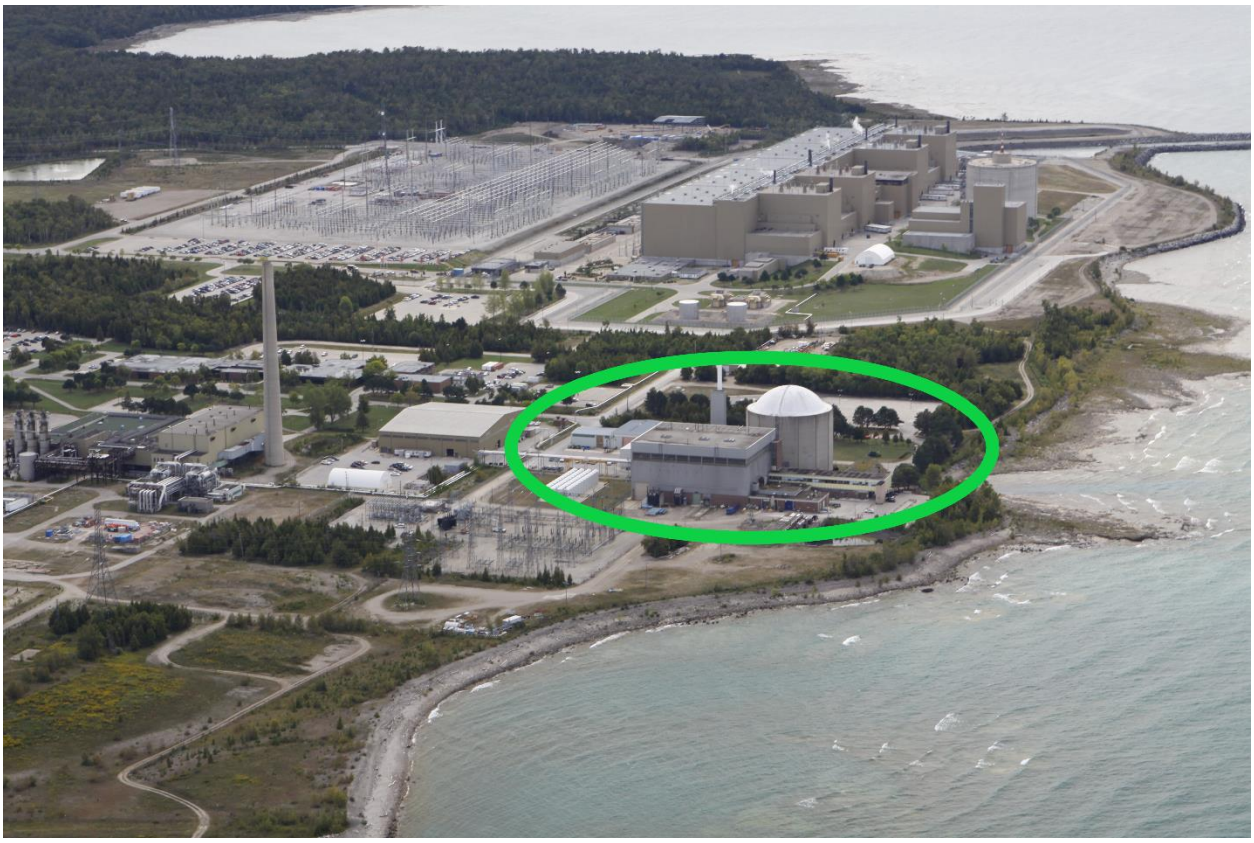

**Figure: Aerial view of the Douglas Point Waste Facility (Area within the green circle only)**

Since 2015, CNL has been managing the DPWF site under a Government–Owned, Contractor-Operated (GoCo) model under agreement with AECL who retains ownership of the site and its associated liabilities on behalf of the Government of Canada. Under this GoCo model, one of the three main objectives of CNL's management is to safely and effectively reduce the federal legacy liabilities and associated risks, based on sound waste management and environmental principles, in the best interest of Canadians.

During licensing period of 2014-2019[1], several Non-nuclear buildings and structures were removed after securing CNSC staff acceptance of their respective Detailed Decommissioning Plans (DDPs) to reduce AECL's overall liability and cost incurred to maintain the DPWF site and to prepare the site for final (Phase 3) decommissioning,. Those buildings included Guardhouse, Plate Shop, Machine Shop, Tool Crib, Emergency Coolant Injection System (ECIS) Tank, and the ECIS Bunker. The waste generated due to the removal of these Non-nuclear buildings and structures was predominantly Clean Waste (~99%).

Hazard reduction campaigns including decontamination and removal of clean, hazardous, and radioactive wastes are ongoing at the DPWF. During 2014-2019, the waste removed as a result of hazard reduction campaigns was also largely Clean Waste (~91%).

During the 2014-2019 licensing period, CNL made 13 shipments of the spent exchange resins i.e. Intermediate Level Waste (ILW), 21 shipments of LLW to CRL and other licensed facilities.

At present the stored waste at DPWF includes 0.02 metric tons (MT) Hazardous Waste, 22,256 spent fuel bundles (High Level Waste, HLW) in 46 canisters, 6 $m^3$ of solid ILW, and 103 $m^3$ of solid Low Level Waste (LLW). These stored wastes and future decommissioning wastes will be handled and disposed in accordance with the provincial and federal regulations and guidelines.

CNL's strategic plan is to relocate all of the DPWF's radioactive waste (i.e. stored waste and future decommissioning waste) to CRL except the spent fuel which will transfer to Nuclear Waste Management Organization's high level waste disposal facility. During proposed licensing period (2020-2034), CNL anticipates a total of approximately 20 shipments of LLW (with a total waste of ~200 $m^3$) and 1 shipment of ILW (with a total waste of ~6 $m^3$) from DPWF to CRL.

CNL maintains a systematic care, maintenance, monitoring and inspection program, and implements the surveillance and Life Management Program (LMP) activities at DPWF. These activities will be continued to ensure that the DPWF remains in a safe, sustainable, and secure state until such time that the facility reaches the currently planned final decommissioning end-state site suitable for other industrial or commercial use.

On 2019 February 13, CNL informed CNSC staff of its intention to proceed with the physical decommissioning of the DPWF. Later on 2019 July 18, pursuant to the *Nuclear Safety and Control Act* and associated regulations, CNL submitted an application to the CNSC Secretariat to amend the current Waste Facility Decommissioning Licence of DPWF without changing the expiration date of December 2034 and authorize CNL to proceed with final decommissioning. CNL has requested to receive an amended licence with expiration date of December 2034 (i.e. 14 year licence) to align with the current license. However, a standard 10 year licence with expiration date of December 2030, would also align well with CNL's decommissioning timeline of the first three planning envelopes.

In order to facilitate the consideration of the licence amendment application from CNL, this CMD is structured such that it provides an overview of the integrated performance at DPWF

[1] At present DPWF's 2020 performance data is not fully available, therefore in this CMD document CNL presents the 2014-2019 licensing period performance.

against each of the 14 CNSC Safety and Control Areas. This document also contains a summary of past SWS activities, hazard reduction campaigns, and future plans of final decommissioning. In addition, specific information is presented on other matters of regulatory interest (e.g., public information program). The current DPWF Licence Conditions Handbook (LCH) identifies the regulatory requirements and licensing basis for the Waste Facility Decommissioning Licence of DPWF.

Subject to the Commission's issuance of an amended licence, a DDP for each planned group of decommissioning activities must still be submitted to, and accepted by CNSC staff before work commences, such that CNSC staff can continue to provide effective oversight of various ongoing project activities. CNL will proceed with these decommissioning, environmental remediation, and waste management activities based on sound environmental and waste management principles, and based on world class practices.

CNL submits this CMD for consideration to enable the amendment of the Waste Facility Decommissioning Licence of DPWF thereby enabling CNL to proceed with final decommissioning activities. The provision of conventional and radiological safety, excellent environmental performance, and rigorous security requirements are ensured through the dedication of staff and the safety culture that is established through the implementation of the robust processes, procedures, and programs governed by the improved Management System. Safe operational practices extend protection to the CNL employees working at the site, contractors, visitors, members of the public, and the environment.

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# 1. INTRODUCTION

The purpose of this document is to present information in support of the application from CNL [1] to amend the current Waste Facility Decommissioning Licence for DPWF [2] authorizing CNL to proceed with final decommissioning.

The proposed amendment to the Waste Facility Decommissioning Licence of DPWF [2] will enable CNL to conduct final decommissioning activities. After the amendment to Waste Facility Decommissioning Licence of DPWF, CNL will continue its commitment for the provision of safe decommissioning and operational practices (radiological and conventional) at DPWF. A comprehensive and mature system of programs and processes is fully implemented, and is being maintained to ensure the fostering of a strong safety culture, at all times. This further enables a commitment ensuring the health, safety, and security of employees and members of the public, with protection for the environment, and ensures that international obligations to which Canada has agreed are appropriately maintained. Safe operation will always be the utmost priority for CNL.

This introductory section presents a brief overview of the DPWF site, progress made during the licensing period of 2014-2019 and future plans that will be implemented after amendment to the Waste Facility Decommissioning Licence during the proposed licensing period of 2020-2034.

## 1.1 Canadian Nuclear Laboratories Corporate Vision

The application [1] to amend the Waste Facility Decommissioning Licence of DPWF submitted for consideration by the Commission, is consistent with the CNL corporate vision and mission. The goal of the company is to advance nuclear science and technology for a clean and secure world and also to safely and cost effectively reduce the federal legacy liabilities and associated risks.

The CNL mission is reflected as follows:

- Restoring and protecting Canada's environment by reducing and effectively managing nuclear liabilities;
- Providing the world with sustainable energy solutions including the extension of reactor operating lifetimes, hydrogen energy technologies, and fuel development for the reactor designs of tomorrow. Together with partners, demonstrating the commercial viability of advanced reactor designs including Small Modular Reactor (SMR);
- Collaborating with medical/educational institutions and pharmaceutical companies to pioneer new alpha therapies for cancer treatments that save countless lives; and
- Leveraging all capabilities for commercial success in Canadian and international markets.

The DPWF decommissioning is part of CNL's Environmental Remediation Management (ERM) organization. The ERM's mission is to use innovative technologies, modern facilities, and technical expertise for safe storage and long-term management of radioactive waste. Furthermore, the permanently shut down buildings and infrastructure are decommissioned in a prioritized manner to reduce legacy liabilities and associated risks by using a graded approach.

The CNL core values are:

- Safety: Freedom from harm, danger, injury, or loss to people and the environment. It is the foundation on which CNL's decision-making stands.
- Respect: Placing a high value on others, treating them fairly, and empathizing their needs.
- Teamwork: The ability to work together, in a collaborative way, toward a common goal.
- Accountability: An attitude and a set of actions that affect how CNL impacts people, situations, and results in a positive way.
- Integrity: Adhering to high ethical standards and strong moral principles, even under pressure.
- Excellence: Striving to achieve an ever-rising standard of quality through continual improvement and innovation.

### 1.2 Licensing History

In 1985, AECL opted for the permanent shutdown and eventual decommissioning of the Douglas Point Nuclear Generating Station (DPNGS). The former Atomic Energy Control Board issued a Waste Facility Operating Licence to DPNGS in 1986. In 1987, the operating licence of DPNGS was replaced with a Waste Management Operating Licence and its title changed to Douglas Point Waste Management Facility. Later in 2014, the CNSC issued a new Waste Facility Decommissioning Licence [3]. The Waste Facility Decommissioning Licence issued in 2014, also covered Nuclear Power Demonstration Waste Facility (NPDWF) and Gentilly-1 Waste Facility (G1WF). In 2018, per CNL's request, CNSC issued separate Waste Facility Decommissioning Licences to NPDWF, DPWF, and G1WF. In 2019, CNL requested the CNSC to amend the Waste Facility Decommissioning Licence of DPWF to enable CNL to proceed with final decommissioning at DPWF.

### 1.3 Decommissioning Strategy

After permanent shutdown of DPNGS, AECL selected a "Deferred Decommissioning" strategy which was based on following Health, Safety, Security, Environment, and Quality (HSSE&Q) considerations:

- A reduction in the dose commitment associated with the handling of radioactive materials due to the decay of short-lived fission and activation products;
- Additional planning time, which may result in more effective long-term management of the wastes generated as a result of decommissioning activities; and
- The potential implementation of lessons learned from other waste management and decommissioning activities within CNL and internationally.

Following the "Deferred Decommissioning" strategy, the decommissioning of the DPWF was planned to occur in the following three phases:

Phase 1 Safe Sustainable Shutdown (1985-1994): This phase of the decommissioning brought the facility to a safe and sustainable, shutdown state, suitable for a period of SWS. This work was completed in 1994 and included the following major activities:

- Defueling of the reactor;
- Removal of heavy water ($D_2O$) from Heat Transport and Moderator systems;
- Removal of booster rods and their assemblies;
- Identification and removal of hazardous materials;
- Transfer of spent fuel from wet storage in the reactor pool to a dedicated dry-storage facility (i.e. Spent Fuel Canister Area);
- Major and minor decontamination activities (disassembly, decontamination, and consolidation);
- On-site consolidation of radioactive or radioactively contaminated components; and
- Radiological surveys on completion of each decommissioning activity.

Phase 2 Storage with Surveillance (1994-to-date): This is the current phase of the facility and referred to as the SWS phase. To ensure continued safe and secure storage of the DPWF site during SWS, required equipment and Safety Related Systems are retained and kept functional. Such systems and equipment includes:

- Radiological monitoring equipment/instruments;
- Fire detection and alarm system;
- Compressed air;
- Reactor Building ventilation system (including the HEPA filtration system);
- Sump system;
- Domestic water system;
- Sewage system;
- Active Liquid Handling System;
- Fuel Canister containment structure;
- Reactor Building containment structures;
- Tools and Test equipment used during inspection and maintenance; and
- Fire suppression equipment such as extinguishers and sprinklers.

Phase 3 Final Decommissioning: This phase includes the final decommissioning activities, implemented in a series of sub-phases that will result in the removal of the equipment and components, buildings and structures, and the return of the land for reuse consistent with its location adjacent to the Bruce site.

At the present time, DPWF is being maintained in Phase 2 (i.e. a safe, storage with surveillance state) in compliance with the obligation for Health, Safety, Security and Environment (HSSE) and regulatory requirements.

## 1.4 Facility Description

The DPWF occupies a small fraction (i.e. 5.5 hectares) of the total Bruce site which covers a total area of 932 hectare (i.e. 2300 acres). The Bruce site encompasses Bruce Nuclear Generating Stations (Bruce 'A' and Bruce 'B'), support facilities including Hydro One's switchyards and transformer stations, Ontario Power Generation's Western Waste Management Facility and CNL's DPWF. The entire property is fenced, and access to the site is restricted and controlled by Bruce Power.

The DPWF comprises parts of Lots 15 and 16 in Lake Range in the Township of Bruce. The Bruce site is located in the County of Bruce on the eastern shore of Lake Huron (100 m from the shoreline), approximately 18 km north of Kincardine and 17 km southwest of Port Elgin at a latitude of 44° 19' 35" N and longitude 81° 36' W (see Figure 1-1). A current layout of the DPWF is shown in Figure 1-2.

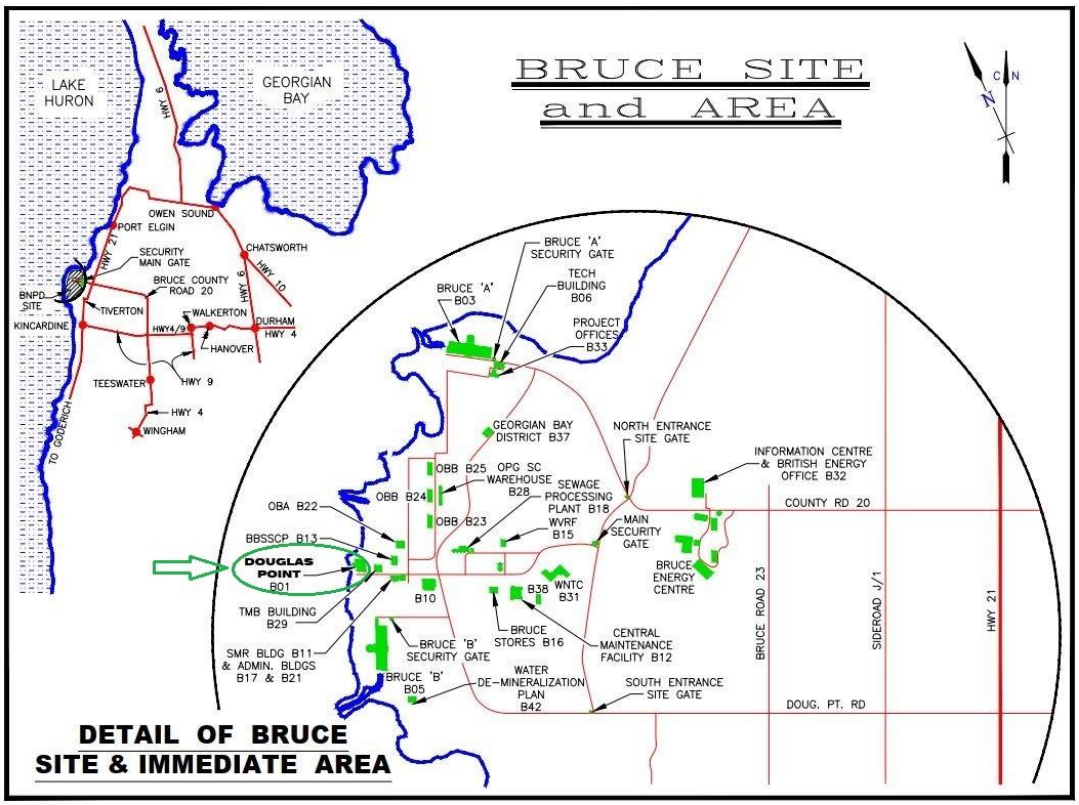


**Figure 1-1 Location of the Douglas Point Waste Facility in Bruce Site (pointed by green arrow)**

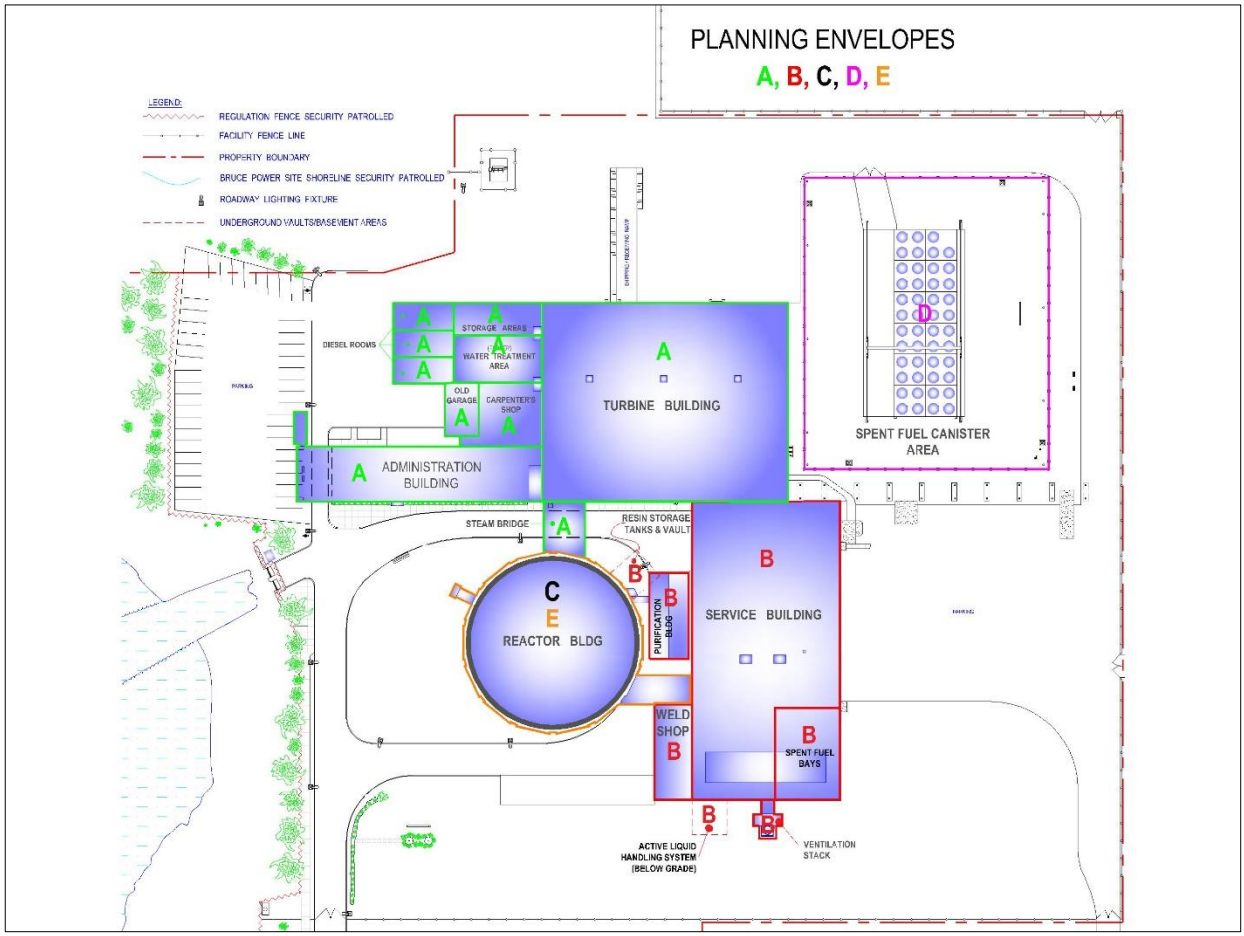


**Figure 1-2 Layout of Douglas Point Waste Facility**

The facilities/buildings at the DPWF site are classified as Non-nuclear and Nuclear [4]. The remaining Non-nuclear facilities/buildings include Administration Building, Turbine Building, Steam Bridge and the Ancillary Facilities which comprise the former Carpenter's Shop, Water Treatment Area, Garage, Storage Area, and the Diesel Room. The Nuclear facilities/buildings include Purification Building, Service Building (including Ventilation Stack, Fuel Bays, and Active Liquid Handling System), Weld Test Shop, Resin Storage Tanks and Vault, Spent Fuel Canister Area, and Reactor Building.

The Bruce site and its surroundings have features of natural, physical, and cultural significances including the Lake Huron shoreline, Lake Huron commercial, recreational and traditional fisheries, and the Baié du Doré Provincially Significant Wetland (PSW). Two Provincial parks (Inverhuron and MacGregor Point), and two conservation areas (Brucedale and Saugeen Bluffs), are within close proximity to the Bruce site.

Land use in the immediate vicinity of the Bruce site is consistent with rural development throughout the township, consisting primarily of agriculture, recreation and rural residential development. There is a 1.6 km non-residence radius around the Bruce site. Beyond this limit, structures include seasonal and permanent year-round dwellings, and agricultural buildings. The immediate land surrounding the Bruce site also includes former gravel pits, fragmented

woodlands, streams, and wetlands. Recreational land use includes Inverhuron Park (a provincial park) and cottages in the hamlet of Inverhuron (south of Bruce Power) and Baié du Doré/Scott Point area (north of Bruce Power). The towns of Kincardine, Port Elgin, Southampton, and Walkerton are the largest residential communities in the area.

A variety of the wildlife species have been reported on and around the Bruce Power site, however, no *threatened* wildlife species (including Barn Swallows) have been discovered on the DPWF site.

## 2. PROGRESS DURING LICENSING PERIOD OF 2014-2019

### 2.1 Storage with Surveillance

CNL successfully implemented the SWS phase at the DPWF during the 2014-2019 licensing period in accordance with the *Douglas Point Waste Facility Storage With Surveillance Activities & Schedules* and complied with all of the requirements of the DPWF LCH [5], [6].

*The Douglas Point Waste Facility Storage With Surveillance Activities & Schedules* provides a concise description of the monitoring, surveillance, testing, and ageing-related structural evaluation activities that are required for Structures, Systems, and Components (SSCs) including the Safety Related Systems at the DPWF. A complete overview of the DP site and planned decommissioning activities are described in the *Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1: Program Overview* document [4].

A Life Management Program (LMP) is in place at DPWF to monitor the degradation of buildings and structures due to ageing. Under this LMP, visual inspections are performed at predetermined frequencies and, if necessary, remedial actions are proposed. The proposed remedial actions are tracked for their completion under a LMP Corrective Action Plan (CAP).

Table 2-1 provides summary of some operational activities, modifications, and repair activities that were performed during the 2014-2019 licensing period.

**Table 2-1**
**Operational Activities, Modifications and Repairs during the 2014-2019 period**

| Year[2] | Notable Changes, Modifications, and Repairs |
|---|---|
| 2014 | • As part of facility maintenance, a sewage pump was refurbished and re-installed and second sewage pump was replaced with a new unit.<br>• Work which commenced in 2013 to repair the Reactor Building roof and replace the access ladder and railings was completed in 2014.<br>• A temporary ventilated enclosure was constructed in Room S123 to support dry active waste removal. Enclosure ventilation was tied into the Reactor Building exhaust system and was subsequently removed.<br>• An isolation valve was installed on the domestic water line where it enters the Service Building. This work was one part of the CAP associated with an event in 2009 where a domestic water line in the Non-nuclear Area of the Service Building fractured and released water into the building.<br>• The Douglas Point Waste Management Facility licence (WFOL-332-4.3) was replaced with a new Prototype Waste Facilities Decommissioning Licence: WFDL-W4-332.01/2034.<br>• In preparation for the steel racking removal from the Turbine Building and Tool Crib, the fire suppression system attached to the racking located in the Tool Crib was isolated from the building fire protection system, and the line cut and capped. |
| 2015 | • As part of the LMP CAP, the following activities were undertaken:<br>▪ All of the heaters in the stairwell between the Administration Building and the Turbine Building were replaced to prevent deterioration of the walls and windows due to high humidity levels.<br>▪ Deteriorated steel covering in and around the steam bridge was restored to prevent water and animal ingress.<br>▪ Cleaning and repainting of structural steel in targeted areas was completed to prevent corrosion of these support columns.<br>▪ Approximately eighty feet of sprinkler piping in the old Water Treatment Room was replaced, after a leak was discovered.<br>▪ Improvements to the Turbine Building envelope were completed, such as removal of wooden coverings and replacement with |

[2] Calendar Year

| Year[2] | Notable Changes, Modifications, and Repairs |
|---|---|
| | non-combustible steel, replacement of windows that were broken or missing to prevent water and animal ingress into the facility.<br>• The following activities were completed to address the Fire Hazard Assessment (FHA) CAP:<br>▪ The racking and caging system in the Turbine Building and Tool Crib was removed in order to reduce the fire load and improve means of egress from these areas.<br>▪ Portions of the fire sprinkler system were upgraded in various rooms located at the first floor of the Turbine Building.<br>• Bruce Power dosimetry services to the DPWF were replaced with CNL Dosimetry Services based out of the Chalk River Laboratories (CRL) (both bioassay and Thermoluminescent Dosimetry (TLD) readings). |
| 2016 | • As part of corrective maintenance work:<br>▪ The Upgrader/Stack Building roof was repaired as a result of damage due to high winds.<br>▪ A call-out system to alert facility staff was installed to notify staff of a loss of Class IV power or any diversion of water to the drain line.<br>▪ An underground drain line was replaced that directs water collected on the Reactor Building roof to the main discharge, then to Lake Huron.<br>• A new fire-detection and alarm system was installed throughout the facility.<br>• As part of the continued LMP CAP, the following activities were performed:<br>▪ Thickness assessments were completed on various steel structures throughout the facility. A protective coating was applied to the Turbine Building emergency stairwell, structural steel members of the ventilation stack, and the bases of several columns in the Purification Building.<br>▪ Repairs were performed to the roof of the Tool Crib where water ingress was noticed.<br>▪ Cracks in the concrete on the third floor of the Turbine Building where the turbine was situated were filled.<br>• Guardhouse and associated sewage tank and piping were removed along with the entrance pedestals and gate. |

| Year[2] | Notable Changes, Modifications, and Repairs |
|---|---|
| 2017 | • A new Modular Trailer Complex (MTC) was installed on the south parking lot at DPWF. The facility staff housed in the Administration Building were transferred to the MTC in order to facilitate future decommissioning of the building.<br>• Two temporary boilers were also installed to remove the DPWF from the Bruce Power-supplied steam system.<br>• An upgrade to the surveillance system in the Spent Fuel Canister area, which was completed and tested. |
| 2018 | • Several routine and corrective maintenance tasks were executed, including:<br>▪ Repairs to the Reactor Building dome and the addition of a protective coating were completed.<br>▪ The original wooden overhead door in the Purification Building was replaced with a new metal overhead door in preparation for future waste removal activities.<br>• Legacy waste stored in Hold-up Tank and Evaporator Tank was drained and transferred to Waste Treatment Centre at CRL.<br>• Spent Resins and contaminated water stored in underground tanks were removed and sent to CRL for storage after volume reduction.<br>• Emergency Coolant Injection System (ECIS) Tank was removed.<br>• Plate Shop, Machine Shop, and Tool Crib buildings were removed. |
| 2019 | • ECIS Bunker was removed.<br>• As part of an LMP action, the Purification Building roof and the Service Building roofs were repaired.<br>• The prototype reactors licence was split into 3 separate licences with associated LCHs. |

## 2.2 Hazard Reduction Campaigns

CNL conducted multiple hazard reduction campaigns during the licensing period of 2014-2019. These reduction campaigns included removal of the wastes generated as a result of the routine and non-routine operations and also legacy stored waste resulted from the past operational activities.

CNL is actively running waste reduction campaigns at all of its sites including DPWF. The main goals of the hazard reduction campaigns at DPWF are:

- Protect safety and health of the worker, the public and the environment;
- Remove operational waste, legacy waste, and contaminations (radiological and non-radiological) from shutdown facilities/buildings;
- Reduce Government of Canada nuclear liabilities and associated risks and maintenance costs; and
- Support future decommissioning activities at site.

Summary of the waste removed as a result of hazard reduction campaigns is given below:

- ~3,600 MT of Clean Waste of which approximately 98% of was recycled; and
- ~400 MT of Hazardous Waste and LLW.

The Hazardous Waste and non-recyclable Clean Waste was disposed in a licensed waste management facility and local landfills respectively. The LLW was shipped to the CRL site for interim storage.

## 2.3 Removal of Non-nuclear Buildings

To reduce AECL's overall liability and cost incurring to maintain the DPWF and to prepare the site for final (Phase 3) decommissioning, several Non-nuclear Area buildings and structures were removed upon CNSC staff acceptance of their respective DDPs. These buildings include Guardhouse, Plate Shop, Machine Shop, Tool Crib, and Emergency Coolant Injection System (ECIS) Tank, and the ECIS Bunker. The decommissioning waste produced due to removal of these Non-nuclear buildings include:

- ~2,500 MT of Clean Waste of which approximately 93% was recycled; and
- ~5 MT of Hazardous Waste and LLW.

The Hazardous Waste and non-recyclable Clean Waste were sent to an external licensed waste management facility and local landfills respectively for disposal. The LLW was sent to CRL for interim storage.

Following subsections provide a brief summary of removal of the Non-nuclear buildings and structures.

### 2.3.1 Guard House

The Guardhouse, a single storey structure, was constructed in the mid 1960's. It was used as an entry check post to the station and also served to store the employees/visitors badges. In 2016, the Guardhouse and associated sewage tank and piping along with the entrance pedestals and gate were removed. The area was backfilled and landscaped, and trees were planted. A new fence and gate were installed, and the sidewalk was upgraded. Figure 2-1 shows an external view of the Guardhouse before removal and Figure 2-2 shows the footprint of Guardhouse after removal.


**Figure 2-1 Guardhouse - Before Removal**


**Figure 2-2 Guardhouse – After Removal**

### 2.3.2 Plate Shop, Machine Shop, and Tool Crib

The Plate Shop and Machine Shop buildings were erected during the 1990/91 period. Both buildings were single-storey, butler-type steel frame structures on concrete slabs with exterior metal cladding and insulated steel interior cladding.

The Plate and Machine Shop buildings were used as fabrication shops to support construction activities of the Bruce Engineering and Construction Services group on the Bruce site and were never used for DPWF operational requirements. However, after ceasing the activities of the Bruce Engineering Services group, these buildings were occasionally used for storage of surplus equipment and materials during the SWS phase.

The Tool Crib area was built in the 1970's as an addition to the Service Building for Ontario Hydro's use. It was a two-storey high structure attached to the east side of the Service Building. No activities involving radioactive materials were carried out in this building.

In 2018, the Plate Shop, Machine Shop, and Tool Crib buildings were demolished and removed from the site. Figure 2-3 and Figure 2-4 show the Plate Shop and Machine Shop before and after removal. Figure 2-5 and Figure 2-6 show the footprint area of the Tool Crib before and after removal.

**Figure 2-3 Plate Shop and Machine Shop – Before Removal**


**Figure 2-4 Plate Shop and Machine Shop – After Removal**

**Figure 2-5 Tool Crib – Before Removal**


**Figure 2-6 Tool Crib – After Removal**

### 2.3.3 Emergency Coolant Injection System

The Emergency Coolant Injection System (ECIS) was an emergency reactor cooling system installed as a backup to the dousing tank and moderator tank emergency cooling system that would be deployed in the event of a loss of coolant accident. The pumps, cooling system and associated piping were located in a sub-grade concrete bunker attached to the northeast of the Reactor Building.

This equipment was never used for operational purposes. The ECIS storage tank was drained during the course of safe shutdown activities. No activities other than routine inspection and maintenance had been conducted since reactor shutdown.

#### 2.3.3.1 Emergency Coolant Injection System Tank

The ECIS emergency coolant (light water) was stored in an insulated concrete tank having a capacity of 680 $m^3$. It was situated west of the Reactor Building. The location of the earth mound covering the tank is shown in Figure 2-7.

In 2018, the ECIS Tank was removed. The footprint of the ECIS tank after removal is shown in Figure 2-8.

**Figure 2-7 Emergency Coolant Injection System Tank (Earth Mound) - Before Removal**

**Figure 2-8 Emergency Coolant Injection System Tank - After Removal**

#### 2.3.3.2 Emergency Coolant Injection System Bunker

The cooling system equipment such as the pumps, heat exchanger, and associated piping and controls were located in the ECIS Service Building/Pump House (bunker) which was a sub-grade concrete bunker attached to the Reactor Building at the northwest side. The bunker was ~9 m. below grade and ~4 m. above grade. The external view of the ECIS Bunker is shown in Figure 2-9.

In 2019, the ECIS Bunker was removed. The footprint area of the ECIS Bunker after removal is shown in Figure 2-10.

**Figure 2-9 Emergency Coolant Injection System Bunker - Before Removal**

**Figure 2-10 Emergency Coolant Injection System Bunker - After Removal**

### 2.4 Regulatory Inspections

Eight inspections were conducted by CNSC staff during the 2014-2019 licensing period and resulted in some actions and recommendations. The identified issues have been resolved and all recommendations have been implemented. Currently there are no regulatory enforcement actions due.

International Atomic Energy Agency (IAEA) also conducted four inspections and no regulatory enforcement actions were issued.

## 3. FUTURE PLANS FOR THE PROPOSED LICENSING PERIOD OF 2020-2034

### 3.1 Storage with Surveillance

CNL will continue to maintain systematic monitoring and inspection programs in accordance with the schedules listed in *Douglas Point Waste Facility Storage with Surveillance Activities & Schedules* to ensure that the DPWF remains in a safe, sustainable, and secure state until such time that the facility reaches the final decommissioning end-state.

The SWS Activities & Schedules including Life Management Program will be reviewed and updated, as required.

### 3.2 Hazard Reduction Campaigns

CNL will continue to run the hazard reduction campaigns to achieve following goals:

- Protect safety and health of the worker, the public and the environment;
- Remove operational waste, legacy waste, and contamination (radiological and non-radiological) from shutdown facilities/buildings;
- Reduce Government of Canada nuclear liabilities and associated risks and maintenance costs; and
- Support future decommissioning activities at site.

The waste that will be removed during hazard reduction campaigns include:

- Clean Waste (e.g., wood, metals, trash, etc.);
- Hazardous Waste (such as asbestos containing materials, lead, PCBs, mercury, fluorescent tubes, batteries, and silica);
- LLW (such as contaminated metals, wood, concrete and lead, Personal Protective Equipment and Clothing (PPE&C), legacy stored waste); and
- ILW (such as booster flow tubes, ram extensions, and active pool debris).

The waste resulting from hazard reduction campaigns will be managed by following CNL's Waste Management program as well as provincial and federal regulations.

Wastes will be reduced in volume to the extent practicable by following ALARA principle and packaged appropriately for their intended destination. The disposition of the waste will be determined, using the following list of options, in the order of decreasing preference:

- Reuse (off-site)
- Recycle (off-site)
- Dispose (off-site waste management facility)

### 3.3 Decommissioning Plans

The overall strategy and plans for final decommissioning of DPWF are described in *Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1: Program Overview* document [4] and submitted as part of the DPWF licence amendment [1]. This DDP Volume 1 will supersede the current *Douglas Point Waste Facility Preliminary Decommissioning Plan* once a decommissioning licence is granted.

As detailed in the DPWF DDP Volume 1, for the purpose of decommissioning planning and prioritization of work, the facilities/buildings at the DPWF have been classified as Nuclear and Non-nuclear, and further grouped into five Planning Envelopes (PE) as shown in Table 3-1. CNL will continue to submit DDPs for specific buildings and structures to CNSC staff for acceptance and implement those plans while ensuring the safety and health of workers, the public, and the environment.

Figure 3-1 shows DPWF layout and highlights the decommissioning Planning Envelopes.

**Table 3-1**
**DPWF Decommissioning Planning Envelopes**

| Planning Envelope | Facility/Building/System | Nuclear/ Non-Nuclear | DDP Volume |
|---|---|---|---|
| Planning Envelope A | Turbine Building<br>Administration Building<br>Ancillary Facilities (Carpenter's Shop, Water Treatment Area, Garage, Storage Area, and the Diesel Room)<br>East Steam Lines and Supporting Structure<br>Steam Bridge | Non-nuclear | Volume 2 |
| Planning Envelope B | Purification Building<br>Service Building (including Ventilation Stack, Fuel Bays, and Active Liquid Handling System)<br>Weld Test Shop<br>Resin Storage Tanks and Vault | Nuclear | Volume 3 |
| Planning Envelope C | Reactor Building Clear-Out | Nuclear | Volume 4 |
| Planning Envelope D | Spent Fuel Canister Area | Nuclear | Volume 5 |
| Planning Envelope E | Reactor Building Decommissioning (Calandria, dome, and the containment) | Nuclear | Volume 6 |

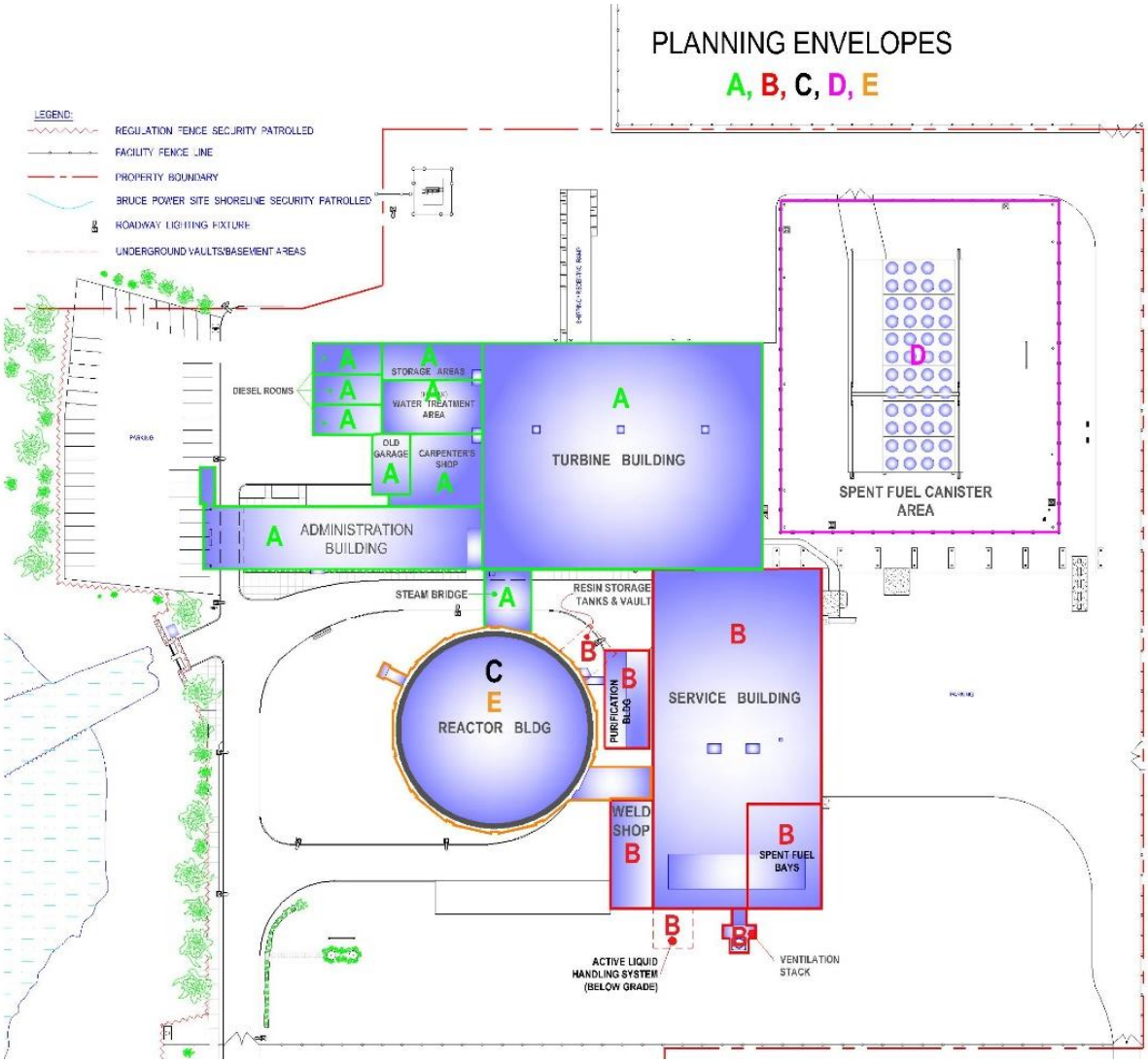


**Figure 3-1 DPWF Layout Highlighting Decommissioning Planning Envelopes**

Decommissioning of the Spent Fuel Canister Area (i.e. PE-D) can only be carried out after the spent fuel has been removed. As with all of Canada's spent nuclear fuel, Douglas Point's fuel will eventually be emplaced in the Nuclear Waste Management Organization's high level waste disposal facility. Once the selected site is announced - scheduled for 2023 - a decision will be made on whether to continue interim storage of the fuel at the Douglas Point site or to transfer it to central interim storage at the CRL site.

A simplified view of the proposed schedule for DPWF decommissioning is shown in Table 3-2. At the end of final decommissioning, the Douglas Point site will be suitable for other industrial or commercial use.

**Table 3-2**
**DPWF Conceptual Decommissioning Schedule**

| Actvities | Duration (Year) | 1984-1994 | 1995-2019 | 2020 | 2021 | 2022 | 2023 | 2024 | 2025-2034 | 2035-2070 |
|---|---|---|---|---|---|---|---|---|---|---|
| Safe Shutdown Activities | 10 | → | | | | | | | | |
| Storage with Surveillance* | 75 | | → | → | → | → | → | → | → | → |
| Licence Amendment | - | | | → | | | | | | |
| Planning Envelope A | 4 | | | | → | → | → | → | | |
| Planning Envelope B | 2 | | | | | | → | → | | |
| Planning Envelope C | 8 | | | | | → | → | → | → | |
| Planning Envelope D | TBD | | | | | | | | | → |
| Planning Envelope E | TBD | | | | | | | | | → |
| Final End-State Report | TBD | | | | | | | | | → |
| Request to Terminate DPWF Licence, CNSC Acceptance, and Transfer of Site | TBD | | | | | | | | | → |

TBD stands for “To be determined”.

## 4. SAFETY AND CONTROL AREA - MANAGEMENT SYSTEM

CNL's Management System is the platform to enable the continuance of safe operational practices. The Management System ensures safe, effective and efficient conduct of work, delivering against commitments within appropriate accountabilities and controls.

CNL's Management System is comprised of an integrated set of documented policies, expectations, standards, procedures, and responsibilities through which CNL is governed and managed, from the high-level setting of direction through to day-to-day operations, all within a coherent control and accountability framework. The system applies to all CNL locations including DPWF.

CNL's corporate policies continue to provide direction and expectations to management and employees for all business activities performed at DPWF, and all other site locations. As itemized below, CNL operates under nine corporate policies. All policies have been authorized by the CNL Board of Directors and approved by the CNL President and Chief Executive Officer.

- Nuclear Safety
- Safety and Health
- Environment
- Quality
- Security
- Property (Asset) Management
- Supply Chain
- Intellectual Property
- Ethics & Business Conduct

A core prerequisite for CNL's success in consistently bringing high value to its customers and stakeholders is the effective and efficient governance and management of the company. CNL is committed to excellence in management, thereby providing the foundation on which the company and its employees can thrive. The Management System has been specifically developed to the requirements of the new GoCo business model and contracts of CNL, ensuring the achievement of regulatory compliance.

The Management System applies to all CNL management and execution activities. The management activities include setting expectations, enabling, planning and budgeting, and assessing all aspects of business, thereby ensuring delivery against commitments within appropriate accountabilities and controls. The execution activities include the safe, effective and efficient conduct of work across all CNL lines of business, performed by CNL employees as well as third parties engaged through external partnerships, collaboration and CNL's Supply Chain.

Internal reviews of performance provide CNL senior management with the ability to assess the performance and effectiveness of the management system through the following mechanisms:

- Nuclear Performance Assurance Review Board (NPARB), which reviews the performance of site-wide facilities and programs on a quarterly basis. As part of CRL NPARB, the DPWF NPARB provides a mechanism for executing the Site Licence Holder's functional oversight of activities (processes and health, safety, security, environment, and quality programs) and facilities important to continued licensing of the DPWF site. The board meets quarterly to review the performance and effectiveness of CNL's processes, programs, and nuclear facilities, in order to identify opportunities for improvement and the need for change.
- Corrective Action Review Board, which reviews the status of the corrective actions program, its outcomes, and the results of internal audits.
- Contractor Assurance System, which is used to integrate various performance measures and indicators to provide an evaluation of contractor performance.

CNL's Management System aligns with Canadian Standards Association (CSA) N286-12 [7].

## 4.1 Management of Safety

CNL's safety culture continued to be enhanced through execution of an action plan, focussed on safety culture, which included actions addressing the following key areas:

- improve equipment reliability;
- drive desired behaviour;
- improve problem identification and resolution;
- improve use of operating experience and reduce isolationism;
- improve standards of operation; and
- improve management oversight.

In 2013, AECL/CNL released its Nuclear Safety policy aligned with the industry's ten Traits of a Healthy Nuclear Safety Culture. The traits evolved from eight Nuclear Safety Culture Principles with a focus on behaviour at all levels of an organization.

In 2016, an employee survey was conducted by a third-party organization for CNL. The results on safety and security questions ranked the highest overall, with a 76% positive rating. A key strength was the high positive rating on performance management and, specifically, clarity on job expectations, as well as a high positive scoring on collaboration within work groups. A number of high neutral scores, particularly in areas such as leadership and vision/direction indicated a need for more information on long-term plans. Overall survey results were published on CNL's intranet site enabling all employees to review the breakdown of the results.

In 2017 and 2018, CNL conducted additional employee surveys using a third party vendor to administer the confidential survey and report on the findings. Results from the 2017 and 2018 surveys continued to support steady engagement and enablement results relative to 2016. Results demonstrated that CNL remains close to the overall North American norm. Six of the top ten positive responses in the 2018 employee survey related to questions about workplace

safety showing CNL's safety culture was working, and remained successfully integrated into daily work and operations.

The organization continues to focus on safety culture through reinforcement of performance expectations in the Human Performance Management (HU) initiatives described in Section 5.

Both Human Performance Fundamentals and Nuclear Safety Culture courses are required training for all employees. The Human Performance Program continues to deliver both courses to all new employees during their new employee orientation, in addition to a variety of HU specific training facilitated throughout each year.

CNL exercises due diligence with respect to the health and safety, security, and environmental risks associated with hiring contractors or other external resources through:

- Evaluation of proposed work,
- Assessment of prospective Contractors, and
- Ongoing oversight of work activities.

## 4.2 Licensee Organization

Internal organizational changes have been executed to be consistent with the requirements of the Organizational Change Control process. The purpose of the process is to ensure that organizational changes are controlled in a manner such that safety and business risks are minimized, and will not adversely affect the safe and reliable operations of facilities and sites.

As part of the restructuring of AECL, in 2014, CNL was stood up as a wholly owned subsidiary of AECL, with almost all of the AECL workforce being transferred into CNL. Applications were made to the Commission and to CNSC staff to transfer from AECL to CNL the various licences and certificates issued by the Commission and by Designated Officers. Although the licensee name was changed to CNL, there were no changes in corporate vision, strategic outcome or value proposition.

On 2015 September 13, the restructuring of the AECL was completed with the transfer of shares of CNL to Canadian National Energy Alliance (CNEA), a private-sector entity. The final implementation of the GoCo model is shown in Figure 4-1.

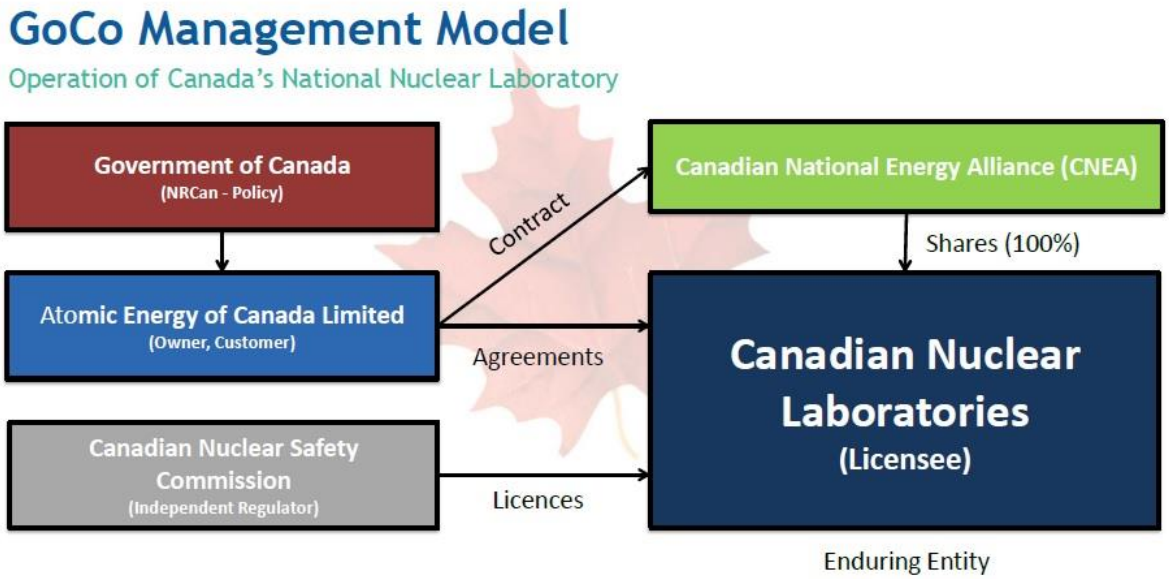


**Figure 4-1 GoCo Management Model for CNL Laboratories**

Responsibility for the management and operations of each element of CNL's organizational structure was assigned to executives and senior management reporting to the President and Chief Executive Officer. CNL's current organizational structure is depicted in Figure 4-2.

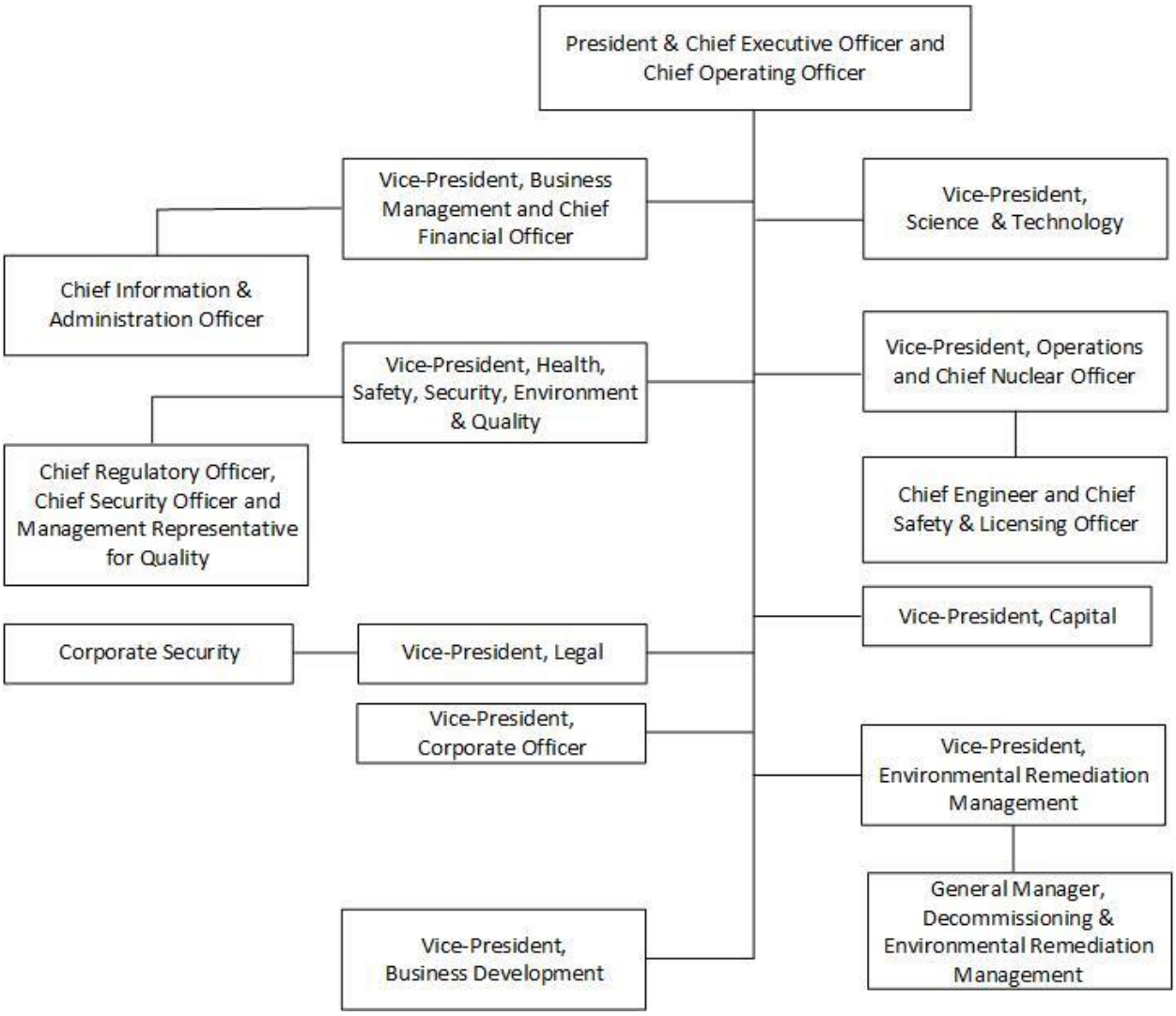


**Figure 4-2 Canadian Nuclear Laboratories Executive Team and Corporate Authorities**

Organizational reporting structure for Decommissioning project is shown in Figure 4-3. The General Manager, Decommissioning and Environmental Remediation, is the Site Licence Holder.

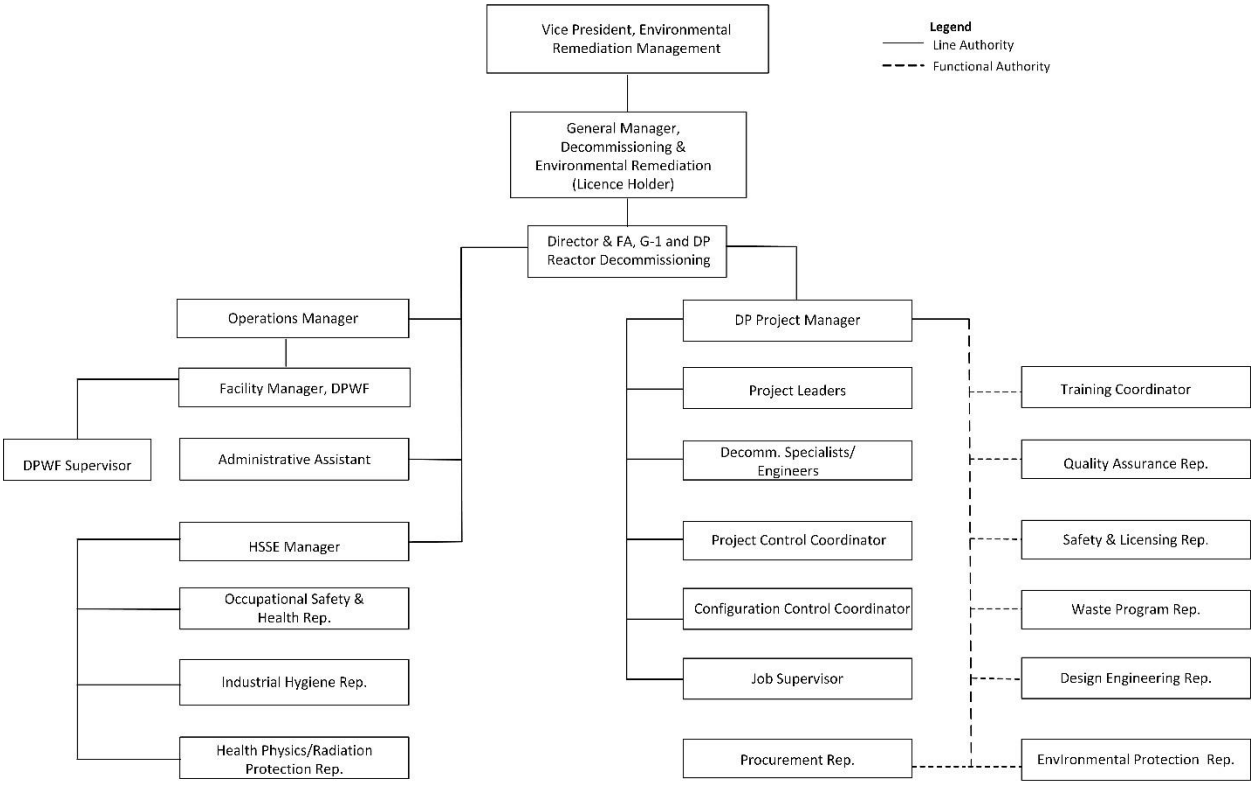


**Figure 4-3 Organization Chart - Decommissioning Projects Execution Team at DPWF**

## 4.3 Past Performance

AECL/CNL continued to strengthen the framework through which it manages and operates to provide assurance that DPWF is operated/decommissioned safely and in full compliance with CNSC licensing obligations. During the 2014-2016 period, the following actions took place to improve the Management System that was in place until the new (2017) system was implemented:

- A holistic, corporate framework for managing CNL was established to align and integrate safety, program delivery, people management, facilities management, and strategic improvement;
- Executive-level champions were appointed and held accountable for defining standards, institutionalizing enabling processes, and providing oversight for each area of the new corporate management system framework;
- Nuclear safety oversight mechanisms were strengthened by adjusting quarterly reporting to senior management to bring greater focus on health, safety, security, and environmental performance; and

- Oversight of health, safety, security, and environmental risk mitigation system comprises several mechanisms including: independent assessments, self-assessments, regulatory oversight, and review of status of health, safety, security, and environment priorities.

In 2014, AECL launched a wholly owned subsidiary under the name of CNL. In 2015, coincident with the transfer of the ownership of CNL from AECL to the CNEA, minor revisions to the Management System manual, the Management System Governing Documentation Index Sites, and the Management System Appointments Registry were made to capture administrative changes.

CNL has since embarked on a plan to significantly revise and improve the Management System suite of documentation whereby the company-wide support functions are centralized and standardized. The improved CNL Management System captures the development of the transformed organization from a federal entity to a GoCo company. Furthermore, there has been strengthening of the platform that enables CNL to satisfy the CNSC requirements for establishing and maintaining the 14 Safety and Control Areas (SCAs) as prescribed in the DPWF LCH [6].

In 2016, a multi-phased project was launched to align the management system to the requirements of the new CNL business model; simplification of the management system framework; clarification of roles, responsibilities, authorities, and accountabilities; and, a reorganization of the management system documentation suite.

In 2016, a project team was assembled to develop improvements, to resource the writing of the new documentation suite, and to provide oversight to ensure that change was managed in a controlled manner. The focus of the project was to improve and simplify the management system, while continuing its alignment with safety and operational principles already being implemented.

A new management system document type, Executive Management Directive, was developed to address and implement any actions from the President and Chief Executive Officer in a timely manner. The directives may be developed to address compensatory measures or emergent requirements and are typically in effect for a specified period of time (generally less than six months), after which they may be incorporated into permanent document types, as necessary. The directives may contain implementing details, until such details can be captured in lower-level documents. For example, three directives were released for use in 2016: “Working on Roofs”, “Gating and Sanctioning”, and “Project Charge Codes Creation or Amendment”.

The transformed Management System provides, enables, and defines a detailed framework for continued safe operation of the nuclear facilities and laboratories at all CNL sites, including DPWF. The various mature programs and processes, already in place, will continue to evolve to ensure that all regulatory requirements are achieved. The revised Management System manual and sub-tier documents were initially submitted to CNSC staff in 2017. The final (2018) phase of the multi-year Management System Evolution Project focused on the implementation level of processes and/or programs. The project provided a focus on safe operational practices and compliance with applicable regulator frameworks.

The major undertaking of upgrading CNL's Management System Framework which was started in 2016 successfully concluded on 2019 March 29.

As mentioned previously, the management system for decommissioning at DPWF is based on CSA N286-12 [7].

### 4.4 Future Plans

Plans for the next proposed licensing period of 2020-2034 include:

- Initiatives to ensure continued alignment to changing regulatory and standards requirements;
- Implementing a continuous improvement program to ensure that the integrated management system enables effective and efficient management of the company; and
- Reflecting best-of-class management practices as seen in the nuclear industry.

## 5. SAFETY AND CONTROL AREA - HUMAN PERFORMANCE MANAGEMENT

CNL has a responsibility to ensure safety for its employees and the public, and to protect the environment from any potential hazards associated with operating its sites and facilities including DPWF.

The Human Performance (HU) Program is managed by the Performance Assurance department within the Health, Safety, Security, Environment, and Quality organization at CNL. The Performance Assurance requires all functional support areas, line management, and employees to report different types of events and implement specific documented programs and processes in their respective areas. To achieve this goal, the Performance Assurance function provides tools, methods, training, and expertise. The program also interfaces with other programs with respect to risk management related to variability in human performance and maintains a high level of line engagement to provide efficient delivery of program services.

The main objectives of the program are to:

- Strengthen the safety culture at CNL;
- Evaluate human performance effectiveness in the work environment;
- Reinforce the use of human performance methodology through training, communication, and observations;
- Assist leaders in promoting and modelling safe work practices and behaviours;
- Assist employees to recognize and avoid error-likely situations;
- Evaluate error-likely situations, assess defences based on evaluations, and ensure defence-in-depth; and
- Reduce the error rates through the use of human performance tools.

### 5.1 Fitness for Duty

During the licensing period of 2014-2019, elements of a holistic approach to Fitness for Duty were in place and the process was initiated to articulate them within a formal program

architecture. CNL also continued pre-employment medical screening and annual physical testing for firefighters and specific emergency and protective service roles. For DPWF, the emergency and security services are provided through Bruce Power and CNL vetted the Bruce Power Fitness for Duty program to meet CNL's requirement as part of the contracting process.

Elements of a mature Fitness for Duty program have been in place at CNL since 2015 (e.g., Continuous Behavioural Observation program). The updated Fitness for Duty procedure addresses strategies for mitigating and recognizing the effects of fatigue in the workplace. The updates included guidance for employees on how to access assistance at any location where CNL operates.

Furthermore, a revision of the disability management and return-to-work programs was performed during 2015, and a third-party service provider has been contracted to support the disability management process for non-occupational illnesses and injuries.

CNL provides and continues to actively promote its third-party Employee and Family Assistance program in support of the overall health and the wellness of its employees.

CNL participated in industry meetings in order to provide comments to CNSC staff on REGDOC-2.2.4 (*Fitness for Duty*) [8].

### 5.1.1 Systematic Approach to Training

Training and Development provides centralized leadership and management of training functions at CNL. The primary function of the Training & Development Program is to ensure that employees are adequately and efficiently trained to safely and competently perform their roles and responsibilities. The Training & Development department is responsible for assessing, developing, implementing, and monitoring the effectiveness of programs for training, authorization, and certification activities for CNL personnel company-wide.

CNL's Systematic Approach to Training (SAT) process consists of four main areas:

- Training analysis;
- Training design and development;
- Conducting training; and
- Training evaluation.

Application of the SAT is mandatory for all personnel performing licence listed activities. The scale and scope of application for all other personnel is determined based on the importance of the job to nuclear safety. CNL's training procedures are aligned with REGDOC-2.2.2 (*Personnel Training*) [9] and are applied in a graded approach.

CNL's contracts stipulate the qualification requirements for contract staff performing specific work at CNL; this includes CNL's General Safety Orientation, and CNL's radiation protection training. In addition to training, CNL oversees all contract work and all CNL work control practices apply.

### 5.1.2 Past Performance

The HU Program has strengthened and ensured that relevant processes are in place to minimize human error and thus the frequency and severity of unplanned events in the CNL organization. Through the application of human performance concepts and tools (behaviours), CNL continues to improve its capability to recognize, predict, and safely respond to physical hazards and unsafe acts or conditions. The HU program is implemented for all CNL employees, at all CNL and customer sites, including DPWF.

The HU program has developed line-led human performance training which is geared towards creating a healthy safety culture based on internalization of human performance principles and personal accountability.

The following improvement initiatives were carried out under the program:

- Established the Human Performance Steering Committee;
- Developed, tested, and implemented an Event Free Day Reset (EFRD) program;
- Established the Human Performance Advocate program;
- Developed and implemented a Field Observation and Coaching Fundamentals Workshop;
- Improved training materials in support of a Safety Culture Workshop;
- Conducted a comprehensive Safety Culture Survey in 2019;
- Completed the implementation of a Nuclear Safety policy in 2014;
- Implemented and aligned the Traits of a Healthy Nuclear Safety Culture to the existing Nuclear Safety policy;
- Rolled out a communication strategy that included: Traits of a Healthy Nuclear Safety Culture posters, personalized booklets, and weekly-topic bulletins;
- Developed, piloted, and released Observation-and-Coaching software (ObservationWay), which allows for building custom observation cards based on the requirement of each line;
- Conducted Senior Management Observation to improve procedure execution and reduce safety related workplace incidents;
- Participated as a stakeholder in the development of Integrated Work Control and updated Event Free Tools standard document to reflect the changes in Pre-Job Brief;
- Continued to create and distribute a weekly communications article designed to initiate timely and relevant safety-related conversations at meetings throughout the organization;
- Developed and launched the “Focus of the Week” process; and
- Created “Eventicons”, which consisted of posters, magnets, and booklets, in order to promote Event Free Tools (a set of seven discrete behaviours and techniques that assist employees to maintain positive control of a work situation) awareness.

During the 2014-2019 licensing period, HU team delivered 540 training sessions on a variety of Human Performance Topics.

In 2017, new Human Performance Program documents were developed, based on revisions to existing documents, to align with the new CNL Management System.

Under a line-led training initiative, HU issues, weakness and/or gaps from across CNL were addressed during 2019. The completion rates of training for high-risk employees and low-risk employees were 90% and 80% respectively.

The HU program together with a cross-functional team from across CNL, and external resources, conducted a Safety and Security Culture Assessment in 2019. And a response plan was developed which will be implemented in the beginning of Fiscal Year 2020/2021.

CNL conducted a company-wide Safety Stand Down for all staff on 2019 May 30. CNL had determined that its industrial safety metrics were declining, and were not as good as those of similar nuclear laboratories. All normal work ceased for the day; the day was devoted to increased safety awareness, strengthening work practices, and identifying emergent safety issues where immediate action would produce quick gains, in addition to recognizing issues where improvements would take longer. A high level of engagement by all staff, supervision and management resulted in a renewed commitment to safety across CNL.

The HU group continued to collaborate with the business lines to support the reinforcement and internalization of event free tools. Realizing that peer leadership is a part of achieving accountability, Human Performance ensured that the trainings are tailored and geared towards creating a healthy safety culture based on personal accountability through the internalization of human performance principles. The line-led training format promotes learning across the organization.

### 5.2 Future Plans

The Training and Development program will continue to provide centralized leadership and management of training functions at CNL. This program will continue to be responsible for assessing, developing, implementing, and monitoring the effectiveness of training programs for training and authorization activities throughout the company.

CNL's Training and Development staff will continue to administer the CNL SAT documentation, the corporate training plans, and the Learning Management System.

The HU programs will continue to improve employees' capability to recognize, predict, and safely respond to physical hazards, and unsafe acts or conditions.

CNL will continue to vet the Bruce Power Fitness for Duty program to ensure it meets CNL requirements.

## 6. SAFETY AND CONTROL AREA - OPERATING PERFORMANCE

Monitoring of safety performance in the operational area is achieved through the concept of "events" and the associated record of "Event Free Days". This is a fundamental measure of CNL's safety performance, and is a key element in ensuring staff remains engaged and committed to safety at all times.

## 6.1 Operation

Douglas Point Waste Facility is being operated safely in accordance with site specific procedures and programs, and company-wide programs and procedures, as well as Action Levels specified in Section 9.2 of DPWF LCH [6]. For DPWF, the Dose Action Levels are equivalent to the Operational Limits and Conditions. The operating performance is monitored through internal and regulatory assessments and audits. Internal operating performance monitoring tools include Nuclear Performance Assurance Review Board (NPARB), self-assessments, and audits. The regulatory audits/inspections are conducted by the regulatory bodies such as the CNSC and IAEA.

## 6.2 Operational Experience and Corrective Action Program

The Operating Experience (OPEX) and Corrective Action programs review and analyze pre-existing events and issues, operating experience, and lessons learned, from both internal and external sources.

The OPEX program is CNL's learning mechanism to improve operational and safety performance. It utilizes tracking tools and database information, both from within CNL and from external sources, to improve the safety of operations, improve operational performance, and reduce the significance and occurrence of unplanned events at all CNL sites including DPWF.

The overall objective of the OPEX program is to achieve higher levels of operational safety and performance, and to reduce the significance and the occurrence of unplanned events at CNL. This is done by responding to and internalizing the "Lessons to be Learned" from unplanned events, both from CNL and from the industry in general.

The OPEX program provides and supports processes for identifying, recording, investigating, and implementing corrective actions, to prevent recurrence of internal events. This includes reporting those events internally, and externally to regulatory agencies and to the nuclear industry.

The OPEX program interfaces with facility and line management mainly through the Corrective Action Program. The Corrective Action Program is a real-time system that provides rapid identification of issues and an effective and efficient means for communicating certain issues to management. The purpose of the program is to document and (where warranted) remediate problems, prevent occurrence/recurrence of significant problems, and address opportunities for improvement and trending.

The Corrective Action Program includes a comprehensive process for:

- Identifying, investigating, documenting, and resolving problems;
- Capturing and disseminating opportunities for improvement and operating experience (OPEX program);
- Initiating, monitoring, completing and reviewing actions for effectiveness where warranted; and

- Extracting facts, data, and trends of events and sharing them within the organization through the OPEX process.

The Corrective Action process is structured to provide for the timely and effective resolution of identified issues affecting personnel safety, operational safety, regulatory compliance, or business operations, which are entered into the ActionWay application (software tool used for the ImpAct[3] process). Assessment and analysis of issues is facilitated through the use of different methods and techniques such as rapid learning, root cause analysis, and apparent cause analysis.

### 6.3 Past Performance

CNL's Conduct of Operations program ensures appropriate integration and adequate reflection of safe operating practices to meet business requirements. Inputs to the CNL Conduct of Operations program include:

- Site and facility licensing (acts, regulations, licences, handbooks);
- Industry standards;
- Compliance programs (under CNL's HSSE&Q organization);
- Policies; and
- Commitments.

The following improvement initiatives were developed for the OPEX Program to fulfill the program's objectives:

- OPEX bulletins were issued to the business lines. For example, in 2019, 233 external OPEX bulletins and 46 internal OPEX bulletins were shared with all business lines for review of applicability;
- Operating experience records from both internal and external sources were made available to line organizations; and
- The development and implementation of a new process called "Rapid Learning" was implemented company wide as part of a continued commitment to defence-in-depth and organizational learning.

Events at the DPWF site are reported to the CNSC staff as required by the *Nuclear Safety Control Act* (NSCA) [10], the regulations and the Waste Facility Decommissioning Licence of DPWF. In 2016, the CNL's reporting procedure document was revised to fully incorporate the additional requirements (reporting to Duty Officer) specified in the 12(2) letters from CNSC staff that were issued to CNL licensed locations including DPWF. Training and implementation of the revised procedure was subsequently completed for all sites including DPWF.

For each calendar year since 2014, an Annual Compliance Report (currently called Annual Compliance Monitoring Report) [11] has been provided to CNSC staff in accordance with the Licence Condition 5.1 of the DPWF LCH [6].

[3] ImpAct = Improvement Action (process).

Table 6-1 provides a summary of DPWF Impact Events by Significance Level (SL) for the licensing period of 2014-2019. During this period, no radiation incidents occurred at DPWF which resulted in exceedance of the Action Levels.

**Table 6-1**
**Number of DPWF ImpAct Events by Significance Level – 2014-2019**

| Year | Level 1 | Level 2 | Level 3 | Level 4 | Total |
|---|---|---|---|---|---|
| 2014 | 0 | 0 | 3 | 11 | 14 |
| 2015 | 0 | 0 | 4 | 66 | 70 |
| 2016 | 0 | 0 | 0 | 38 | 38 |
| 2017 | 0 | 0 | 0 | 13 | 13 |
| 2018 | 0 | 0 | 4 | 46 | 50 |
| 2019 | 0 | 0 | 5 | 33 | 38 |

Level 1 A highly significant problem that causes a major reduction in the margin of safety to the public or employees and/or which has a major impact on the environment, safety or business performance.

Level 2 A significant problem that causes some reduction in the margin of safety to the public or employees and/or which has some impact on the environment, safety or business performance.

Level 3 A problem, which is not significant by itself, but has the potential to be more significant or may be the precursor to a more significant problem.

Level 4 A minor problem, which will help to identify by means of trend analysis, those areas that need more attention. Improvements are assigned a significance Level 4.

### 6.4 Future Plans

Facility safety governance documentation (Action Levels, site specific programs, and procedures, and company-wide programs and procedures) will continue to be reviewed, updated (as required) and implemented during the proposed licensing period of 2020-2034, as activities and business needs change at the DPWF site.

## 7. SAFETY AND CONTROL AREA - SAFETY ANALYSIS

The Safety Analysis Program develops and controls the suite of nuclear safety analysis documents required to support the licensing basis of all nuclear facilities at CNL sites, including DPWF. This program applies to all safety analysis activities involving CNL's SSCs and all management, supervision and staff.

Safety Analysis Reports (SARs) are produced to demonstrate that the facilities are appropriately designed to meet health, safety, security, environmental, and regulatory requirements, and are operated safely. These SARs form part of the basis for a set of limiting conditions for safe operation. For DPWF, the Action Levels given in Licence Condition 9.2 of DPWF LCH serve as Operational Limits and Conditions [6].

## 7.1 Past Performance

CNL maintains a SAR for the current SWS Phase of DPWF. The DPWF SAR demonstrates that the continuation of SWS activities do not pose any unacceptable risk to workers, the public and the environment and the radiological consequences of accident scenarios do not exceed public dose limit. The DPWF SAR was updated as per Licence Condition 6.1 of the DPWF LCH [6] and submitted to the CNSC staff in 2019.

In support of DPWF final decommissioning planning, a Preliminary Hazard Analysis (PreHA) and a Bounding Accident Analysis (BAA) were conducted.

The purpose of PreHA was to:

- Identify and rank potential hazards to workers and the public from credible accidents during final decommissioning of DPWF; and
- Identify the methods for mitigating the risks associated with such hazards.

The PreHA was used to support the selection of bounding accidents for decommissioning activities to be conducted as a part of final decommissioning of DPWF.

The main objectives of the DPWF BAA were to:

- Determine the bounding events (i.e. higher than anticipated radiological conditions, dropped load and fires);
- Assess radiological risk to facility workers, on-site receptors, and off-site receptors due to final decommissioning activities; and
- Identify methods for mitigating the risks associated with the bounding events in accordance with the safety analysis requirements for decommissioning listed in the CSA N294-09 [12].

The BAA concluded that the dose consequences to the facility workers, on-site receptors, and off-site receptors are within the dose acceptance criteria.

## 7.2 Future Plans

During the proposed licensing period of 2020-2034, to support the planned decommissioned work and associated DDPs (Table 3-1), safety assessments will be conducted for each Planning Envelope with areas and facilities containing radiological contamination and materials. These assessments will identify potential radiological hazards to workers and the public from both routine decommissioning activities and credible accidents during decommissioning, and address methods for mitigating the risks associated with such hazards. The safety

recommendations will be captured in the respective DDPs and/or incorporated into associated Work Plans for implementation.

## 8. SAFETY AND CONTROL AREA - PHYSICAL DESIGN

Physical design is managed under the Design Authority and Design Engineering program. The Design Authority and Design Engineering program maintain and control the design basis within approved safety margins and regulatory requirements, and applies to all design engineering activities at all CNL sites including DPWF. The CNL Design Authority holds Professional Engineers Ontario (PEO) accountability for the design process.

The purpose of the design program is to ensure that design is planned, executed, verified, and documented according to applicable codes, standards, regulatory, and customer requirements. It ensures that safety-related structures, systems and components (SSC), and any modifications to them continue to meet the design basis. The Design Engineering program complies with CSA N286-12 (Management System Requirements for Nuclear Power Plants) [7].

The change control process at DPWF is governed by the Configuration Management program, and is the mechanism by which Design Engineering ensures changes are assessed, designed, reviewed, controlled, implemented, and appropriately captured in compliance with relevant safety and configuration management requirements. The program provides the framework to maintain and control the physical configuration of SSCs at CNL sites including DPWF. This program applies to all design, operations, decommissioning, and maintenance activities, as executed by all management, supervision, staff, and contractors. It applies to all Non-nuclear and Nuclear documents, policies, programs, and procedures which contain information or instructions that could impact:

- design documents (both regulatory and non-regulatory),
- any plant physical configuration, or
- any configuration item or information.

### 8.1 Past Performance

Design oversight and change control have been significantly strengthened, including new and improved processes for Design, Engineering Change Control, Field Change Control, and Item Equivalency Evaluations. The Chief Engineer position was appointed as the Design Authority for the nuclear laboratories at all CNL sites including DPWF. This role is responsible for authorizing all design changes, and ensuring that all design, safety and licensing requirements are addressed during the design prior to construction/modification.

Change control has been expanded to the DPWF site, and a more rigorous risk assessment process has been established to ensure changes are reviewed and approved by persons having an adequate understanding of the original and current requirements so as to allow assessment of the effect of the change. The Engineering Change Control Office monitors all changes from initiation through to closeout to ensure that the appropriate approvals are received and engineering and operational documents and drawings are updated prior to closeout. Events and trends are identified and corresponding corrective actions are taken.

Over the years, design oversight and change control have undergone process improvement. Streamlining of procedures to appropriately grade the process based on safety significance and risk has been implemented, as well as the addition of exclusions for very low risk changes that may be executed within the scope of the Maintenance Planning and Work Management Program.

CNL has begun the process of expanding the ability and accountability of staff who may execute the design process. The Chief Engineer position continues to be an important oversight position and retains the responsibility to ensure that staff executing design processes understand their accountabilities. In addition, the Chief Engineer has authority and provides oversight to the execution of the design program. Recently a Design Authority was delegated to DPWF to ensure that the design basis of SSCs continues to be maintained, and to provide technical oversight of execution of design engineering work that includes outsourced design.

CNL continues to perform process reviews of the design program to appropriately grade the application of the program across all sites including DPWF.

### 8.2 Future Plans

During the next proposed licensing period of 2020-2034, CNL plans to design and construct a number of supporting facilities to increase reliability and enable safe decommissioning of DPWF. This includes the design and implementation of a new Class IV power, which will allow the facility to regain configuration control of this system. The Class IV system configuration control was lost due to several changes in ownership of the facilities. Furthermore, this new Class IV system will make isolation of the Non-nuclear and Nuclear buildings and structures safer and easier during their final decommissioning. To increase reliability, an upgraded ground water sump pumping system will be design and installed. This system is anticipated to remain operational until final end state of the facility.

## 9. SAFETY AND CONTROL AREA - FITNESS FOR SERVICE

Since 1995, the DPWF is under Phase 2 Decommissioning i.e. SWS phase. The SWS activities include routine care and maintenance and periodic monitoring, testing and surveillance of the SSCs and ensures that the continued storage of facilities at DPWF do not pose any undue risks to the health and safety of the workers and the public or to the protection of the environment.

CNL continues to implement the SWS and ageing management plans at DPWF to ensure that the required SSCs are available to perform the intended design functions by following company-wide Maintenance procedures, DPWF Life Management Program, and DPWF SWS Activities & Schedules and fully meets the requirements of Licence Conditions 1.3 and 8.1 of DPWF LCH [6] and REGDOC-2.6.3 [13].

### 9.1 Past Performance

CNL performed routine inspections, housekeeping, regular monitoring, calibrations, and maintenance of the facilities/buildings/SSCs to ensure that the DPWF is kept in a sustainable safe shutdown state allowing SWS activities to continue so that there is no hazard to the public or adverse impact on the environment.

The details of the notable routine care and maintenance activities that were performed at DPWF during the 2014-2019 licensing period are provided in Section 2.1.

### 9.2 Future Plans

Fitness-for-service programs will continue for SSCs at DPWF by implementing SWS activities and schedules including ageing management plans. The *Douglas Point Waste Facility Storage with Surveillance Activities & Schedules* document will continue to be reviewed and updated (as required) as DPWF decommissioning progress to ensure the facilities are being maintained in a safe state over the final decommissioning period.

## 10. SAFETY AND CONTROL AREA - RADIATION PROTECTION

CNL's Radiation Protection (RP) program applies to the operation and activities that affect the safety of staff and equipment in terms of exposure to ionizing radiation at all CNL sites including DPWF, and applies to all employees and other personnel (visitors, contract staff, etc.) conducting work at CNL sites.

CNL's RP program provides an overall framework, including organization and responsibilities, processes and procedures, and other related activities as it relates to radiation protection.

The overall objective of the CNL's RP program is to keep doses as low as reasonably achievable (ALARA). In doing so, the RP program will meet its objectives to:

- Comply with, or exceed, the level of radiation safety that is required by the Nuclear Safety Control Act [14] and the CNSC Regulations [15], [16], [17];
- Limit the doses to less than the regulatory limits;
- Limit detrimental stochastic health effects in employees and members of the public to levels as low as reasonably achievable, social and economic factors being taken into account (ALARA principle); and
- Prevent detrimental non-stochastic (deterministic) health effects caused in employees and members of the public.

CNL's RP program at DPWF applies to all licensed activities including monitoring, surveillance, maintenance, and decommissioning.

### 10.1 Past Performance

CNL's RP Program was monitored and improved as necessary to ensure that CNL's radiation safety complied with or exceeded the requirements specified in the *Nuclear Safety and Control Act* [14] and the associated *Radiation Protection Regulations* [15], [16], [17].

During the licensing period of 2014-2019 no radiation incident occurred at DPWF which resulted in an individual exceeding the 6 mSv (600 mrem) action level per four-week period for DPWF as per the Licence Condition 9.2 of the DPWF LCH [6].

The maximum individual whole-body dose, with inclusion of committed effective doses, for DPWF has remained well below the DPWF's Action Level of 6 mSv every four week period during the licensing period of 2014-2019. The highest annual individual dose was 0.43 mSv

(43 mrem) received by a radiation surveyor, with a significant portion of the dose occurring from the resin retrieval project (Table 10-1). The trend of doses is shown in Figure 10-1.

Recently, CNL conducted its 5-year documented review of the action levels for DPWF. Based on the upcoming decommissioning activities at the DPWF site and review of historical dosimetry results, CNL recommended a reduction in the action levels to provide early warnings of any actual or potential loss of control of the radiation protection program. Following feedback and discussion with CNSC staff, action levels will be finalized and implemented.

Successful implementation of the RP program has ensured DPWF's continued operation in compliance with CNSC regulations with no regulatory limits or Action Levels being exceeded during the licensing period of 2014-2019, and the individual and collective doses remaining ALARA. Through the use of the CNL's Management System and ImpAct reporting process, issues were identified, reported, and resolved in a timely manner.

**Table 10-1**
**Distribution of External Whole-Body Dose including Tritium plus Committed Effective Dose from Non-Tritium Intakes**

| Category | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 |
|---|---|---|---|---|---|---|
| Total Persons Monitored | 45 | 78 | 90 | 105 | 135 | 80 |
| Average Effective Dose (mSv) | 0.03 | 0.0017 | 0.005 | 0.005 | 0.01 | 0.01 |
| Maximum Individual Effective Dose (mSv) | 0.15 | 0.06 | 0.11 | 0.37 | 0.43 | 0.24 |

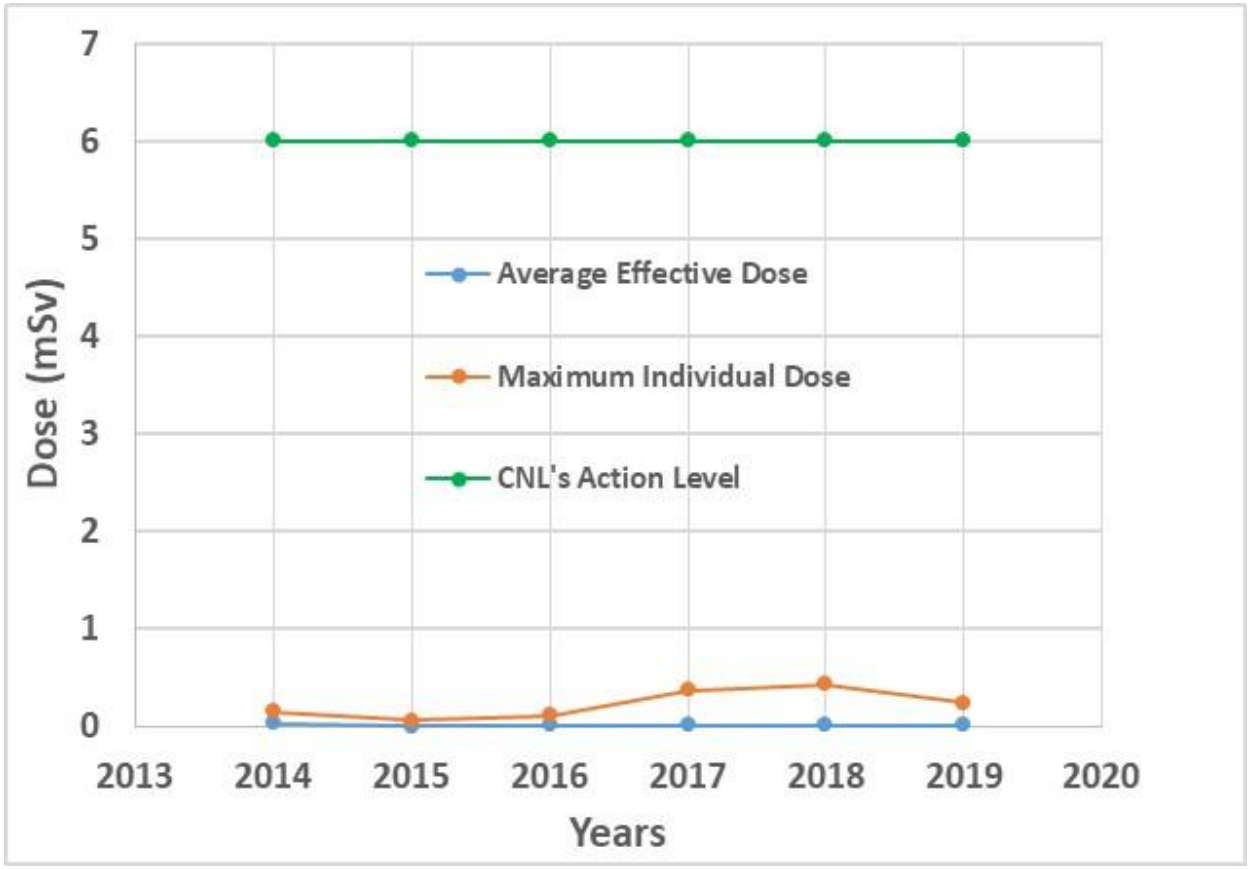


**Figure 10-1 Average Effective and Maximum Individual Effective Doses Trend**

## 10.2 Future Plans

Planned changes and improvements in the provision of radiation protection for CNL include:

- Reduction of radiological controlled areas to optimize provisions of RP controls, monitoring and resources to the decommissioning of remaining nuclear facilities;
- Acquisition and use of enhanced nuclear industry PPE&C options such as air pressurized suits;
- Review, assess and acquire (as appropriate) new and updated RP equipment; and
- Use of Visual Survey Data System (VSDS) which records all radiological surveys and provide electronic storage of the survey data.

In addition to the actions and initiatives already tracked through CNL's ImpAct and ActionWay processes, the RP program will continue to update documentation in the radiation protection requirements document and the RP manuals in response to changes in future work planned at CNL sites including DPWF and changes in regulatory requirements.

As all remaining facilities are planned to be decommissioned at DPWF, CNL will continue to re-evaluate the radiological source term hazard in these areas to ensure that protection is optimized and exposures remain ALARA during the proposed licensing period of 2020-2034.

During the final decommissioning period, CNL will continue to evaluate all non-routine activities and assess for radiological risks and document the appropriate mitigating measures as required per the RP program. The RP resources required will be evaluated and adjusted as the final decommissioning progress.

## 11. SAFETY AND CONTROL AREA - CONVENTIONAL HEALTH AND SAFETY

CNL's Occupational Safety and Health (OSH) program applies to all work performed by CNL employees, and to work performed by others including contractors on sites or work places controlled by CNL including DPWF.

The scope of the OSH program, as an element of CNL's Health, Safety, Security, Environment, and Quality organization, includes the processes for the management of hazards to health and safety of employees and other persons at CNL sites and workplaces.

The purpose of the CNL's OSH program is to prevent accidents and injuries to health arising out of, linked with or occurring to employees in the course of employment, and to all persons on sites or workplaces controlled by CNL. DPWF continues to be proactive in the approach to safe operational practices.

### 11.1 Site Safety and Health Committee

Under the Canada Labour Code Part II, employers are responsible for providing safety-related information, instruction and training to employees, and for developing and implementing an OSH program. As an important and mandatory component of the program, group safety meetings provide an effective venue for the transfer of occupational safety and health related information between employers and employees.

The CRL Site Safety and Health Committee is a forum for joint employee/management consultation and development of solutions for safety and health concerns at all CNL managed sites. The committee meets on a monthly basis and various subcommittees meet on an as needed basis.

The committee provides a mechanism for management/employee cooperative engagement on a range of safety issues, and a forum for addressing employee safety concerns. Activities conducted by the committee include the inspection of all DPWF work locations, participation in incident investigations, and provision of a two-way conduit for communication of safety concerns and improvement initiatives between management and employees.

### 11.2 Health and Safety Policy Committee

CNL has a corporate Health and Safety Policy Committee that meets on a quarterly basis. The committee is the principal corporate wide forum for joint employee/management consultation for the development of health and safety policies for CNL sites including DPWF.

The policy committee provides perspective on programmatic safety issues, independent of the OSH program, and supports the development or revision of CNL's procedures related to safety.

### 11.3 Past Performance

As part of the Integrated Work Control Process, the dedicated DPWF OSH, Industrial Hygiene and RP team members have significant involvement in the planning process. This combined with improvements to contractor management have contributed to DPWF's strong health and safety performance. DPWF continued to participate in the CNL Rapid Learning Morning Call to quickly share safety information with all CNL sites, as well as to collect safety information relevant for the DPWF site.

During the licensing period of 2014-2019, there have been no serious work related injuries or illness at DPWF. This may be attributed to a robust Integrated Work Control process and permitting system that incorporates a hazard prevention program.

CNL continues to actively promote its third-party Employee and Family Assistance program, and provides this service to support employee health and wellness.

### 11.4 Future Plans

The health and safety programs together with the supporting work processes and facility-specific procedures will be continuously developed, updated (as required), and implemented to ensure that conventional hazards from routine activities and decommissioning projects are identified, assessed, and managed adequately to protect the environment and protect the health and safety of workers and the public.

Furthermore, CNL will continue to evaluate all future works for specific hazards and document mitigation measures, as hazards will change as decommissioning progresses. Experience gained from other decommissioning projects and operations within CNL and internationally will be considered while developing mitigation measures for the identified hazards.

## 12. SAFETY AND CONTROL AREA - ENVIRONMENTAL PROTECTION

CNL's Environmental Protection program is designed to ensure protection of the environment and the public with respect to its activities, products, and services. The Environmental Protection program requirements apply to all CNL employees for the CNL-operated sites including the DPWF site.

The Environment policy, issued under the authority of the CNL Board of Directors, states CNL's commitment to protecting the environment and establishes the overall principles and goals for environmental responsibility and performance expected of all CNL employees.

The environmental protection program at DPWF conforms to ISO 14001 and is governed by Federal regulations and legislation and, where applicable, Provincial and municipal regulation and legislation in the jurisdictions where CNL sites are located.

The assurance and validation of compliance with CNL Environmental Protection program requirements at DPWF is achieved through the implementation of DPWF specific procedures and processes which include:

- Douglas Point Waste Facility Effluent Monitoring Plan; and
- Douglas Point Waste Facility Effluent and Operational Control Sampling.

The effluent monitoring activities at DPWF include:

- An annual check against the National Pollutant Release Inventory reporting requirements;
- An annual check against the Greenhouse Gas Emissions reporting requirements;
- Monitoring and reporting any losses of halocarbon refrigerants and fire suppressants over 10 kg, in compliance with the Federal Halocarbon Regulations;
- Airborne release monitoring through tritium and gross particulate (i.e. gross alpha and gross beta) monitoring of the ventilation stack emissions; and
- Waterborne release monitoring through tritium, gross alpha, and gross beta monitoring of the Reactor Building and Service Building external sumps.

## 12.1 Past Performance

Environmental Performance results are reported to CNSC staff every year through an Annual Compliance Report. During the licensing period of 2014-2019, the DPWF releases were minimal and below the reporting thresholds of National Pollutant Release Inventory, Greenhouse Gas Emissions, and Halocarbons.

The airborne and waterborne releases at DPWF are monitored and compared with the Derived Release Limits (DRLs[4]) to ensure workers and members of the public are safe. The airborne releases and waterborne releases during the 2014-2019 licensing period at DPWF remained stable and far below the DRLs.

The radiological airborne emission data along with the Reactor Building HEPA filter Ventilation System performance is presented in Table 12-1. The DRL for gross alpha and gross beta is based on Sr-90, the most conservative radionuclide. The airborne tritium release trend is shown in Figure 12-1.

The radiological waterborne emission data along with the liquid effluent releases as a result of the external groundwater diversion system is presented in Table 12-2. The DRL for gross alpha and gross beta is based on Cs-134, the most restrictive radionuclide. The trends of waterborne tritium, gross alpha, and gross beta are shown in Figure 12-2, Figure 12-3, and Figure 12-4 respectively. Note that in Figure 12-1, Figure 12-2, Figure 12-3, and Figure 12-4, for clear comparison between the measured activities and their respective DRL values, the activities are shown on a logarithmic scale.

[4] Derived Release Limits are calculated for routine discharges of radioactivity in airborne and liquid effluents. Various exposure pathways to workers on the site to members of the public outside the site boundary are considered in the calculations. The DRL represent upper limits for routine emissions of radioactivity.

**Table 12-1**
**Reactor Building HEPA-filter Ventilation System Performance and Airborne Releases for the 2014-2019 Period**

| Year | HEPA Filter Operation Time (Hours) | Airborne Release (Bq) | | | |
|---|---|---|---|---|---|
| | | Tritium (DRL[1]) | Gross Alpha (DRL[1]) | Gross Beta (DRL[1]) | Carbon-14 (DRL[1]) |
| 2014 | 2,048 | 2.74E+11 (1.59E+17) | -[2] | -[3] | 3.07E+08 (2.88E+15) |
| 2015 | 753.5 | 1.33E+10 (5.46E+17) | -[2] | -[3] | <4.49E+08 (1.48E+15) |
| 2016 | 1,535 | 1.59E+11 (5.46E+17) | <1.68E+03[4] (3.69E+12) | <1.91E+04[4] (3.69E+12) | 6.10E+09 (1.48E+15) |
| 2017 | 834 | 1.12E+11 (5.46E+17) | 1.64E+03 (3.69E+12) | 2.29E+04 (3.69E+12) | -[5] |
| 2018 | 2273.5 | 7.96E+11 (5.46E+17) | 3.07E+03 (3.69E+12) | 4.55E+04 (3.69E+12) | 1.51E+09 (1.48E+15) |
| 2019 | 1,017.5 | 2.41E+11 (5.46E+17) | 4.94E+03 (3.69E+12) | 3.9E+04 (3.69E+12) | -[5] |

[1]DRL stands for Derived Release Limit and its unit is Bq/a
[2]Parameter added as of 2016 April
[3] Parameter added as of 2016 April
[4]Samples from the April sub-period were compromised due to operator error and an average of all other monthly analysis results was used for the April data point.
[5]C-14 was not measured as there was no project identified in 2017 and 2019 that generated C-14 emissions

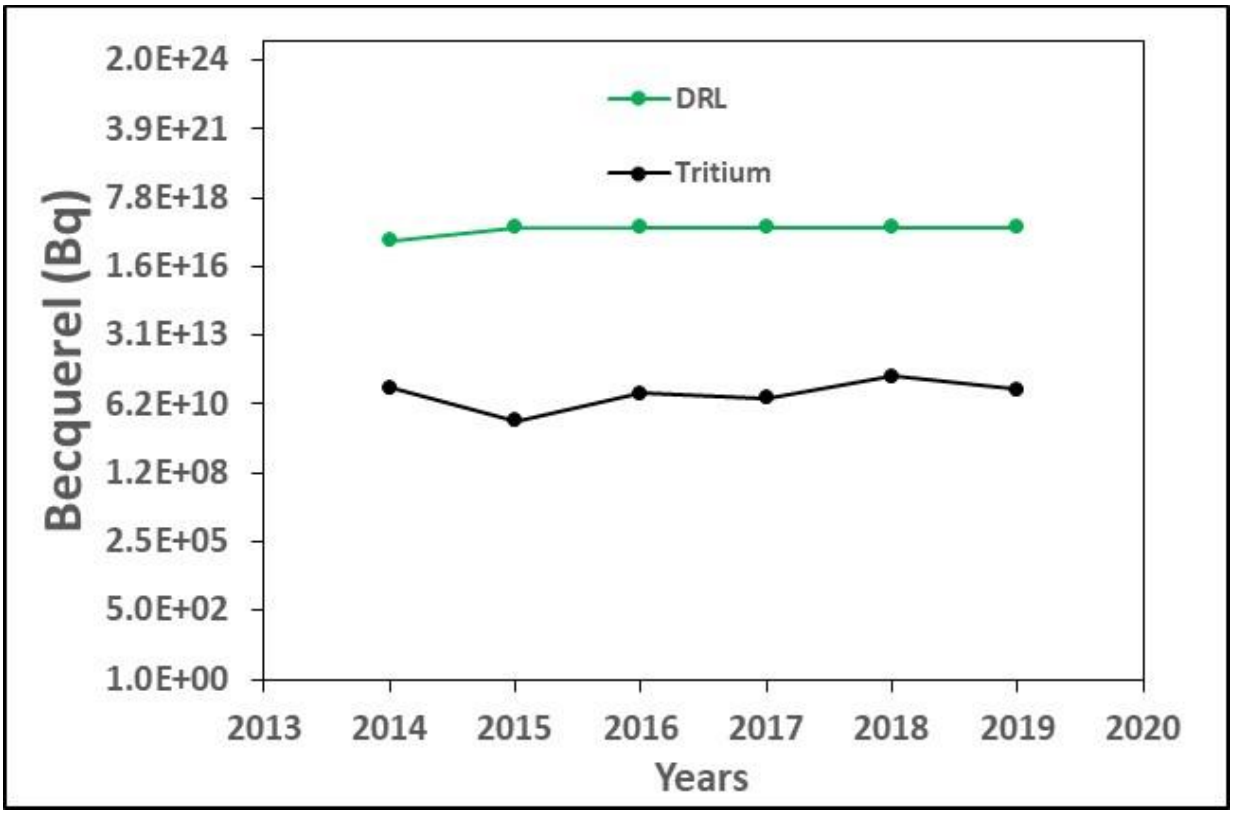


**Figure 12-1 Airborne Tritium Release Trend for the 2014-2019 Period**

**Table 12-2**
**Groundwater Waterborne Releases for the 2014-2019 Period**

| Year | Groundwater Release (Litres) | Waterborne Release (Bq) | | | |
|---|---|---|---|---|---|
| | | Tritium (DRL[1]) | Gross Alpha (DRL[1]) | Gross Beta (DRL[1]) | Carbon-14 (DRL[1]) |
| 2014 | 51,400,440 | 5.19E+10 (1.94E+17) | -[2] | 6.37E+07 (3.71E+12) | 4.16E+09 (1.02E+14) |
| 2015 | 38,050,740 | 4.24E+10 (2.04E+17) | -[2] | 7.31E+07 (3.43E+13) | <3.17E+09 (2.02E+14) |
| 2016 | 32,687,928 | 2.23E+10 (2.04E+17) | 8.98E+06 (3.43E+13) | 1.05E+07 (3.43E+13) | -[3] |
| 2017 | 34,506,108 | 3.57E+10 (2.04E+17) | 1.12E+07 (3.43E+13) | 2.56E+07 (3.43E+13) | -[3] |
| 2018 | 34,463,520 | 2.73E+10 (2.04E+17) | 1.18E+07 (3.43E+13) | 3.43E+07 (3.43E+13) | -[3] |
| 2019 | 37,107,252 | 3.73E+10 (2.04E+17) | 6.75E+06 (3.43E+13) | 4.52E+07 (3.43E+13) | -[3] |

[1]DRL stands for Derived Release Limit and its unit is Bq/a
[2] Parameter added as of 2016
[3]Parameter removed as of 2016

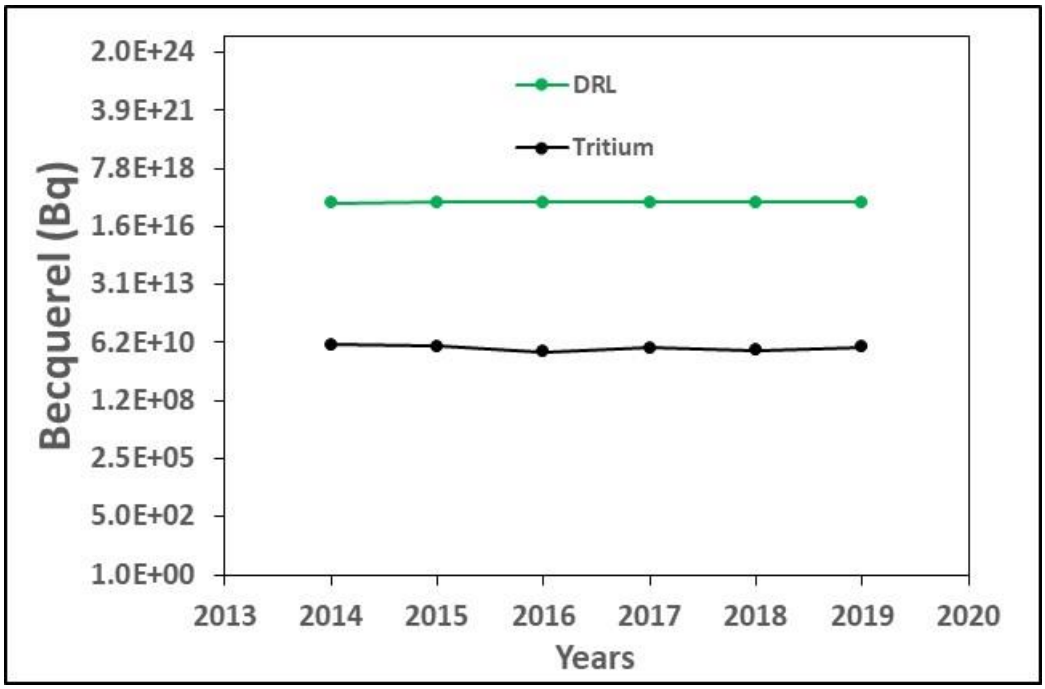


**Figure 12-2 Groundwater Tritium Release Trend for the 2014-2019 Period**

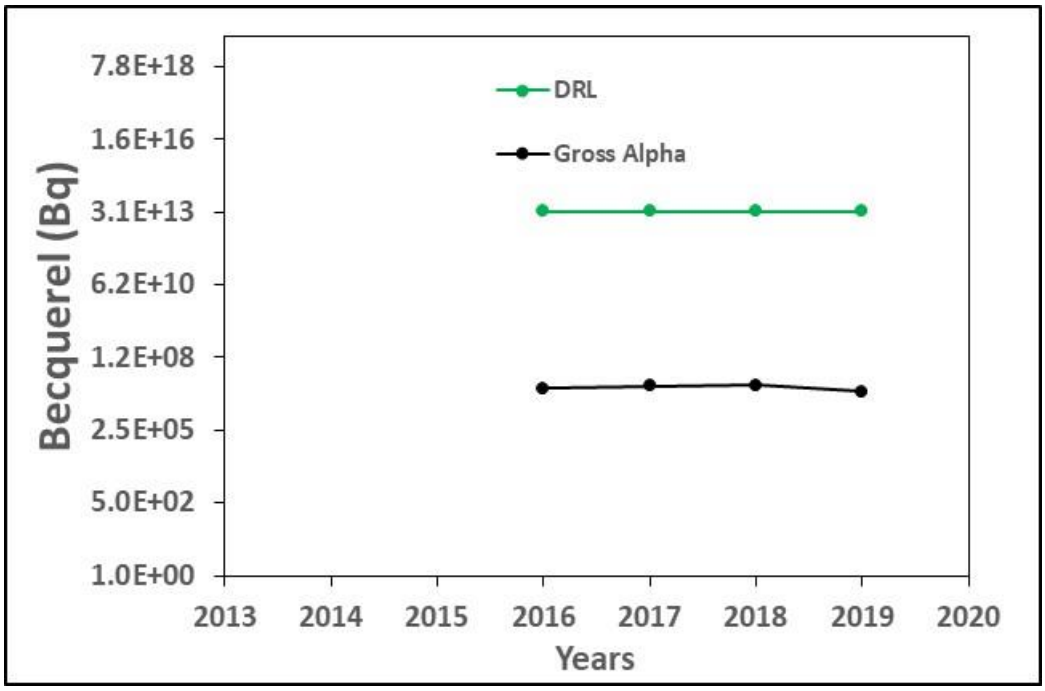


**Figure 12-3 Groundwater Gross Alpha Release Trend for the 2014-2019 Period**

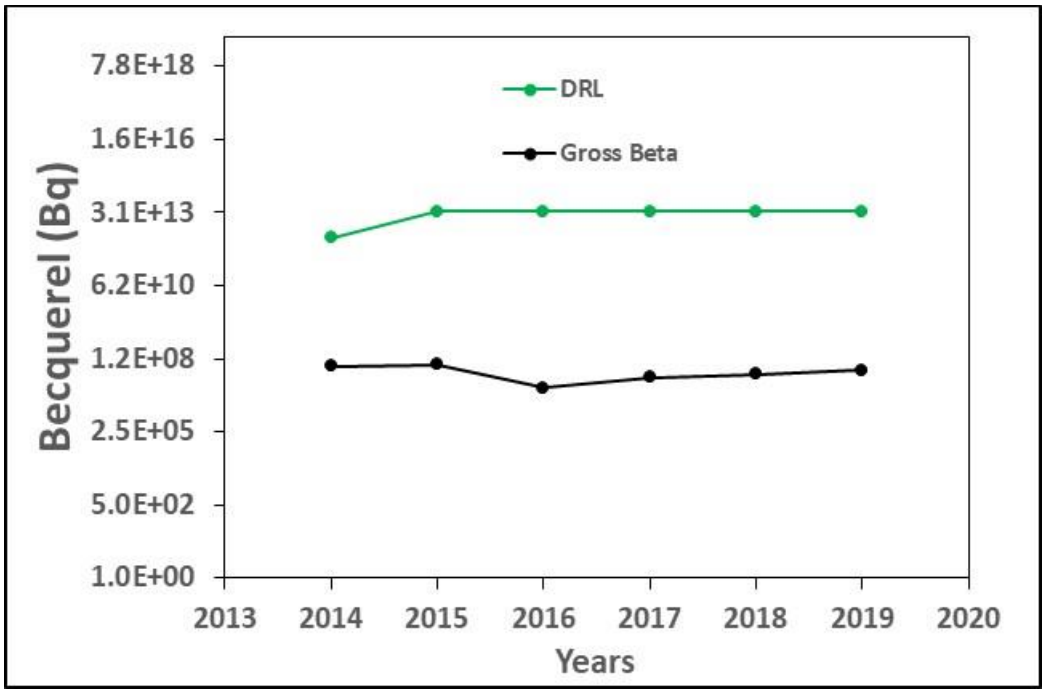


**Figure 12-4 Groundwater Gross Beta Release Trend for the 2014-2019 Period**

In 2019 an Environmental Risk Assessment (ERA) was prepared. The DPWF ERA included both Human Health Risk Assessment and Ecological Risk Assessment and assessed the potential effects of both radiological and chemical/physical stressors resulting from authorized discharges in the facility's current SWS state.

An Environmental Review (ER) was also conducted in accordance with the CNL procedure *Environmental Review of Non-routine Work* to meet Section 67 requirements of CEAA 2012 [18]. This ER study examined the potential effects of the final decommissioning activities on CNL personnel, the public and the environment, and proposed the mitigation measures to ensure that these effects will have minimal/no impact on the workers, the public, and the environment. The ER study concluded that no significant adverse environmental effects will likely result during final decommissioning activities at DPWF provided appropriate mitigation measures are in place.

## 12.2 Future Plans

Over the next proposed licensing period of 2020-2034, improvements in the DPWF Environmental Monitoring Program will be gained through the implementation of:

- CSA N288.7-15, *Groundwater Protection Programs at Class I Nuclear Facilities and Uranium Mines and Mills* [19]; and
- CSA N288.8-17, *Establishing and Implementing Action Levels for Releases to the Environment from Nuclear Facilities* [20].

# 13. SAFETY AND CONTROL AREA - EMERGENCY MANAGEMENT AND FIRE PROTECTION

## 13.1 Emergency Preparedness

CNL's Emergency Preparedness (EmP) program focuses on the prevention and mitigation of, preparedness for, and recovery from abnormal or emergent events. The Program applies to design, operations, and other activities including decommissioning work that may affect EmP at CNL Canadian sites, including the DPWF site. A graded approach to EmP requirements is applied based upon an assessment of the most credible events that could occur at any given location.

Emergency Preparedness provides the oversight to ensure personnel, equipment, and response facilities are maintained in a state of readiness to ensure that both response and site licensing requirements are met. To this end, the EmP program interfaces with internal and external stakeholders to ensure that effective plans, training, equipment, and resources are in place to prevent emergencies and to respond in an integrated and timely manner in the unlikely event that an emergency occurs.

In reason of the Douglas Point Waste Facility location and the Bruce Power Emergency Services capabilities, the Fire and Security emergency responses for the DPWF was contracted to Bruce Power. Additionally, DPWF staff maintain and follow the facility specific emergency procedures.

At the DPWF, the Facility Authority takes the overall responsibility to ensure that facility/building hazards are identified with strategies to respond to abnormal and emergent events. An Officer-in-Charge is assigned by the FA for the overall preparedness and management of emergent events. Employees including contractors are responsible to be familiar with their work area and building emergency procedures, and promptly respond to emergencies as trained or as requested. They shall conduct their work and use equipment, devices, and facilities in accordance with EmP program requirements and the DPWF emergency procedures. Any contractors working at DPWF, in case of emergency, will follow DPWF Emergency Procedures. A CNL staff person is responsible for maintaining a roster of personnel present on the site at all times.

### 13.1.1 Past Performance

A gap analysis was performed in 2019 October to determine DPWF's full compliance to REGDOC-2.10.1 [21] and no areas of concern were found. The gap analysis showed that the procedures, personnel, and equipment are in place to deal with hazards identified by the facility, making DPWF compliant to the regulations set out by the CNSC in REGDOC-2.10.1 [21]. It was recommended that facility shall endeavour to keep all training records and emergency procedure up to date. The emergency procedure has been updated and fully implemented.

### 13.1.2 Future Plans

CNL will continue to review, update (as required) and implement both EmP program and DPWF site specific emergency procedures and complies with the requirements of DPWF LCH [6] and REGDOC 2.10.1 [21].

As part of the decommissioning project execution requirements, emergency instruction will be posted at the entrance to the work area to instruct workers where to shelter and to provide emergency contact information. CNL General Safety Orientation training and daily pre-job briefs will be continued to be conducted with all contractor staff and associated CNL site staff. Supervision of staff, contractors and visitors at the decommissioning site during working hours including any occurrence of extended hours will be established to ensure that the approved work control requirements are being implemented and to monitor the site to ensure proper emergency response, if required. Further, project-specific emergency responses will be recorded in the detailed Work Plans.

In the event of any conventional emergencies including severe weather conditions on the Bruce site, DPWF staff, contractors and visitors shall follow the instruction provided by Bruce Power Emergency personnel, unless otherwise instructed by the Facility Authority. Bruce Power Emergency Response Plan provides direction for emergency evacuation, which applies to all staff including contractors and their staff and visitors at the DPWF site. The Emergency Operations Centre at the BP site will work with DPWF emergency staff to mitigate serious events by coordinating additional resources to the DPWF facility. The CNL/CRL will provide support in Crisis Management and recovery.

### 13.2 Fire Protection

CNL has a comprehensive Fire Protection program, which identifies the requirements, processes and responsibilities to fulfill regulatory obligations pertaining to fire protection at CNL including its DPWF on the Bruce site. The CNL Fire Protection program is applicable to all CNL employees and to other personnel (contractors, consultants, etc.) conducting work at all CNL sites, including routine monitoring and maintenance work and non-routine decommissioning activities at the DPWF. The Fire Protection program applies a risk graded approach in conjunction with defence-in-depth principles to its operations and activities insofar as they may affect fire protection.

The fire protection system at DPWF includes a Fire Alarm and Detection System, consisting of both conventional and a Commercial Wireless Systems International integrated into one system. The inspection, testing, and maintenance of fire protection systems at the DPWF is sourced-out to a third party contractor and the work is carried out to meet the requirements of NFPA 25 [22], NFPA 10 [23], NFC 2015 [24], and CAN/ULC S536 [25].

#### 13.2.1 Past Performance

Due to the close proximity of the DPWF to Lake Huron shoreline, inclement weather events occur occasionally and affects the systems such as fire protection. During 2016-2017 multiple false fire and trouble alarms annunciation events occurred at the DPWF. The fire alarms issues developed after installation of a new Fire Alarm and Detection System as a part of improvement to the existing Fire Alarm Detection System proposed in the FHA. The investigations showed that these alarm events were triggered because of the failure of the detectors, loss of power, and/or wireless system issues. In fact there were no fire events in the facility. A report was prepared which summarized the false fire alarms and trouble alarms

issues and their proposed resolutions. After the implementation of resolutions, the frequency of the false fire and trouble alarms annunciation events has decreased.

The activities which were conducted during the licensing period of 2014-2019 include:

- Routine testing, inspection, and maintenance of the fire protection equipment including fire extinguisher stations, smoke detectors, heat detectors, and sprinkler systems;
- Removal of combustible materials including flammable liquids and chemicals;
- Installation of a new Fire Alarm and Detection System in 2016;
- FHA completed in 2017; and
- Updating Fire Protection procedures and staff training.

### 13.2.2 Future Plans

CNL will continue review, update (as required) and implement Fire Protection program and complies with the requirements of DPWF LCH, CSA Standard N393-13 [26], National Building Code [27], and National Fire Code [24].

As required in the Fire Protection program, inspection, maintenance and testing of the fire protection and fire alarm detection equipment will continue. Furthermore, Fire Hazard Analysis will be completed and their recommendations implemented at least every 5 years.

In addition to complying with the Fire Protection requirements, all DPWF decommissioning projects and non-routine works will continue to be subject to the Fire Protection Screening process by Fire Protection Engineering staff. The Fire Protection Screening process evaluates proposed non-routine work against applicable codes and standards and documents the requirements to be implemented to ensure compliance is maintained. The Fire Protection Engineering staff is involved in all non-routine work for CNL and benefits from other CNL sites decommissioning experience. The recommendations resulting from the Fire Protection Screening assessments are incorporated in individual Work Plans of the decommissioning projects and non-routine works.

## 14. SAFETY AND CONTROL AREA - WASTE MANAGEMENT

### 14.1 Waste Management Program

CNL's Waste Management program provides oversight, compliance, and services for waste management, supporting all waste generators to meet strategic priorities for all phases of the waste management lifecycle, and associated business needs.

CNL is enhancing management of waste in order to have a truly integrated strategy across the company. The Waste Management program continues to refine and communicate the CNL Integrated Waste Strategy to integrate waste lifecycle management across all CNL-operated sites including DPWF, and to capture the CNL baseline waste strategies and defined pathways for all CNL wastes. CNL is taking a holistic view to manage the volumes of waste in an efficient and safe manner, and has produced a CNL lifecycle waste forecast.

In an effort to reduce the waste being generated from CNL activities, the waste hierarchy presented in Figure 14-1 is applied through the lifecycle of the project.


**Figure 14-1 CNL's Waste Hierarchy**

As part of the Integrated Waste Strategy, CNL has developed a baseline strategy for the different type of waste being generated. The Table 14-1 presents the baseline strategy per waste classification (and their definition). CNL provide waste processing and storage services that protect the environment, comply with regulations, and assure health, safety, and security for future generations of Canadians.

**Table 14-1**
**DPWF Baseline Waste Strategy per Waste Classification**

| Waste Type | Description | Baseline Waste Strategy for DPWF |
|---|---|---|
| Non-Radioactive Waste | **Clean Waste** - Non-hazardous material that is declared to be non-radioactive by its history, location and use; or non-hazardous material that has been determined to meet regulatory requirements for unconditional clearance by means of suitable radiological monitoring. | Identify re-use and recycle opportunities<br>Manage waste through local municipal landfills and processing facilities |
| | **Hazardous waste** - Solid, liquid or gaseous waste material, other than a radioactive | Manage as per Hazardous Waste Regulations |

| Waste Type | Description | Baseline Waste Strategy for DPWF |
|---|---|---|
| | material, that may pose a potential hazard to human health or the environment when improperly treated, stored, transported or disposed of, or otherwise managed, and as specified in applicable regulations. | |
| Radioactive Waste | Any material (liquid, gaseous or solid) that contains radioactive "nuclear substances", as defined in Section 2 of the *Nuclear Safety and Control Act* [10] and which the Waste Generator has declared to be waste.<br>The waste classification system is generally organized according to the degree of containment and isolation required to ensure safety in the short and long term. It also considers the hazard potential of the different types of radioactive waste. | |
| | **High Level Waste (HLW)** - Used (i.e. irradiated) nuclear fuel that has been declared as radioactive waste and/or is waste that generates significant heat (typically more than 2 kW/$m^3$) via radioactive decay. | HLW will eventually be emplaced in the Nuclear Waste Management Organization's HLW disposal facility. Once the selected site is announced - scheduled for 2023 - a decision will be made on whether to continue interim storage of the fuel at the Douglas Point site or to transfer it to central interim storage at the CRL site. |
| | **Intermediate Level Waste (ILW)** - Waste which exhibits levels of penetrating radiation sufficient to require shielding but needs little or no provision for heat dissipation during its handling and transportation. ILW generally contains | Segregate ILW using waste hierarchy to optimize storage and disposal requirements.<br>Process ILW, where required, to address hazardous |

| Waste Type | Description | Baseline Waste Strategy for DPWF |
|---|---|---|
| | long- lived radionuclides in concentrations that require isolation and containment for periods greater than several hundred years (i.e., more than 300 to 500 years). | constituents and ensure waste is disposal ready.<br>Consolidate packages at CRL in engineered storage until a geological disposal facility becomes available. |
| | **Low Level Waste (LLW)** - Waste with radionuclide content above established clearance levels and exemption quantities, but that generally has limited amounts of long-lived activity. LLW requires isolation and containment for periods of up to a few hundred years. LLW does not require significant shielding during handling and transportation. | Consolidate LLW at CRL in interim storage until a disposal facility becomes available.<br>Process LLW, where required to address hazardous constituents and ensure waste is disposal ready.<br>Align decommissioning strategy to waste storage and disposal availability. |

### 14.1.1 Past Performance

The waste generated during the licensing period of 2014-2019 due to routine operations, hazard reduction campaigns, and decommissioning activities were managed in accordance to the CNL's waste management procedures and processes and federal and provincial regulations. The details of the waste types and quantities that were removed from DPWF and their disposition pathways are provided in Section 2.2 and Section 2.3.

### 14.1.2 Future Plans

CNL will continue to review, update (as required), and implement a WM program and comply with the requirements of CSA N292.0 [28], CSA N292.3 [29], and all other applicable provincial and federal regulations.

DPWF site specific waste management procedures and plans will also be reviewed, updated (as required) and implemented during both routine operations (i.e. SWS) and non-routine operations i.e. decommissioning. If required, new waste management procedures and plans will be developed, reviewed, and implemented for new projects during final decommissioning of DPWF.

The wastes generated at DPWF will continue to be managed following waste hierarchy and stored or disposed of as per the CNL Integrated Waste Strategy. The baseline strategy for the disposal of stored legacy waste and decommissioning waste that will be produced due to final

decommissioning activities of the Planning Envelopes A through E is provided in the Table 14-1. The specific details on decommissioning wastes and their disposal pathways for each Planning Envelope will be documented in their respective DDPs and Waste Management Plans.

At present, the stored waste at DPWF includes ~0.02 MT Hazardous Waste, ~103 $m^3$ LLW, and ~6 $m^3$ ILW. The summary of the estimated decommissioning waste for the whole DP site excluding Spent Fuel Canister Area (i.e. PE-A, B, C, and E) is provided in Table 14-2. It is expected that ~96% of the total Clean Waste produce from the future decommissioning activities will be recycled.

The anticipated fingerprint (i.e. dominant radionuclides) of the waste to be generated from the main nuclear buildings as a result of both hazard reduction campaigns and future decommissioning activities is as follows:

- Reactor Building
  - Reactor Core Components: Co-60, Fe-55, Ni-63, and Zr-95
  - Primary Heat Transport and Moderator Systems: Co-60 followed by Cs-137 and Eu-154
- Service Building: Cs-137 followed by Ni-63, Sr-90, and Co-60
- Purification Building: Cs-137 followed by Ni-63, Sr-90 and Co-60

These fingerprints will be confirmed through the characterization surveys and will be included in their respective DDPs.

**Table 14-2**
**Decommissioning Waste Estimates for DPWF (PE-A, B, C, and E)**

| Waste Type | PE-A | PE-B | PE-C | PE-E | Total |
|---|---|---|---|---|---|
| Clean Waste($m^3$) | 24,562 | 9,987 | 185 | 38,905 | 73,639 |
| Hazardous Waste ($m^3$) | 350 | 0 | 0 | 0 | 350 |
| LLW ($m^3$) | 0 | 28 | 66 | 173 | 267 |
| ILW ($m^3$) | 0 | 0 | 0 | 308 | 308 |

## 14.2 Decommissioning

CNL has a mandate to safely and cost-effectively reduce the federal legacy liabilities and associated risks, based on sound waste management and environmental principles, in the best interest of Canadian taxpayers.

CNL's Decommissioning & Demolition (D&D) program fully meets the requirements of CSA N294-09 [12], and lists the key process steps associated with decommissioning activities.

### 14.2.1 Past Performance

The *Douglas Point Waste Facility Preliminary Decommissioning Plan* was revised in 2016 as per Licence Condition 13.2 of DPWF LCH. In 2019, CNL submitted *Douglas Point Waste Facility Detailed Decommissioning Plan Volume 1: Program Overview* document to the CNSC staff for their acceptance. The DDP Volume 1 is under review and upon the CNSC staff acceptance will supersede *Douglas Point Waste Facility Preliminary Decommissioning Plan*.

During the licensing period of 2014-2019, CNL conducted hazard reduction campaigns and also removed some of the Non-nuclear buildings and structures upon CNSC staff acceptance of their respective DDPs. This work was completed to reduce the federal legacy liabilities and associated risks and to prepare the DPWF site for final decommissioning activities. The details are provided in Section 2.2 and Section 2.3.

### 14.2.2 Future Plans

CNL is seeking approval to start final decommissioning involving removal of all remaining facilities. The DPWF in its entirety is planned under five separate Planning Envelopes with each Planning Envelope being the subject of an individual DDP (see Section 3.3 for details). Based on the overall site decommissioning priority, individual DDPs covering the respective planning envelope will be developed and submitted to the CNSC staff for review and acceptance prior to execution. The details of the final decommissioning planning and a conceptual decommissioning schedule is given in Section 3.3. While the decommissioning work is in progress all required SWS activities will continue.

CNL will continue review, update (as required), and implement D&D program to fully meet the requirements of the CSA N294-09 [12].

## 15. SAFETY AND CONTROL AREA – SECURITY

CNL Security program meets the requirements of DPWF LCH [6], the Government of Canada's security policies, applicable statues and regulations and applies to the operation and activities that may affect the security and to all employees and other personnel (visitors, contract staff, etc.) conducting work at CNL sites. As such, the Security program ensures protection of CNL employees, facilities and nuclear materials and meets the objectives of the CNL Security Policy. By implementing a strong Security program, CNL also supports Canada's interest in ensuring the protection of assets, information, safeguarding of the public and personnel, and resumption of business.

The routine activities (i.e. SWS) and non-routine activities (i.e. decommissioning) at the DPWF are subject to CNL's Security program. All Contractors must be security-cleared through CNL Security before working at the DPWF and must comply with the Facility's access control requirements.

The physical security at the DPWF site is provided by Bruce Power Security personnel, whose program meets the requirements of CNL's Security program. Since road access to DPWF requires that all personnel pass through the Bruce site security gate, visitors and contractors to the DPWF also require authorization in accordance with established Bruce Power procedures.

CNL performs site security reports and threat risk assessments as required. The routine inspections, testing and maintenance of Security systems at the DPWF are performed by Bruce Power personnel.

### 15.1 Past Performance

During 2016-2017, there were multiple false security alarms at the DPWF and Bruce Power Emergency Response Team activated and responded to the emergency calls. The investigations showed that those events were triggered because of the inclement weather (high winds, snow, fog, etc.) and/or power loss conditions. There were no intrusion attempts to gain access to the Protected Areas of the DPWF. In the past few years, the DPWF security system was upgraded.

### 15.2 Future Plans

CNL will continue to review, update (as required), and implement its Security program at DPWF and meets the requirements of the DPWF LCH [6], the Government of Canada's security policies, applicable statues and regulations. The DPWF follows the Bruce Power's access control procedures and receives the support of Bruce Power Security personnel for inspections, testing, and maintenance of DPWF's Security systems. Bruce Power will continue to provide physical security for DPWF.

## 16. SAFETY AND CONTROL AREA - SAFEGUARDS AND NON-PROLIFERATION

CNL's Nuclear Materials and Safeguards Management (NM&SM) program fully meets the requirements of the DPWF LCH [6], Canada/IAEA Safeguard Agreement, and CNSC-REGDOC-2.13.1 [30] and this program applies to all nuclear materials and safeguards management activities performed at CNL facilities, including DPWF. It covers procurement, receipt, transfer, accountancy, safeguards management, storage, and inventory management of nuclear material. The primary focus of the NM&SM Program is on facilities that contain fissionable material, and are therefore subject to regulatory safeguards measures and reporting requirements.

### 16.1 Past Performance

During the licensing period of the 2014-2019, four inspections were conducted by IAEA and no enforcement actions were issued.

### 16.2 Future Plans

CNL will continue to review, update (as required), and implement its NM&SM program and meet the requirements of the DPWF LCH [6], Canada/IAEA Safeguard Agreement, and CNSC REGDOC-2.13.1 [30].

## 17. SAFETY AND CONTROL AREA - PACKAGING AND TRANSPORT

CNL's Transport of Dangerous Goods (TDG) program provides an operational framework for the safe transport of dangerous goods and fully meets the requirements of DPWF LCH [6], *Transportation of Dangerous Goods Regulations* (TDGR) [31] and the P*ackaging and Transport*

*of Nuclear Substances Regulations* [32].

CNL's TDG program requirements apply to any activities involving the transportation of dangerous goods to or from any of the CNL sites, by all personnel, and all modes of transport, and ensures that all the regulatory and licence requirements are completed prior to packaging and shipment.

### 17.1 Past Performance

The TDG program has developed and implemented a package program to fully meet the requirements of Section 42 of the *Packaging and Transport of Nuclear Substances Regulations* [33].

Qualified Transportation Specialists apply the *Canada Transportation Act* [34]*, Transportation of Dangerous Goods Regulations* [31], CNSC and IAEA regulations [35], and implement the TDG program requirements with a high level of proficiency and diligence. The shipping documentation generated by Transportation Specialists, as applicable to various types of shipments, is consistent and in compliance with relevant requirements.

During the 2014-2019 licensing period, under the TDG program, DPWF made safely 13 shipments of ILW and 22 shipments of LLW to CRL and other licensed waste management facilities.

The TDG program continues to meet all regulatory expectations and requirements with a high level of cooperation and communication between CNL personnel involved in TDG shipments (including both Shippers (Consignors) and Receivers (Consignees)) and staff representing external organizations.

The TDG program has implemented, and continues to maintain compliance in the following areas:

- Training of personnel who customarily prepare shipments of dangerous goods for off-site consignees;
- Preparation of all types of packages containing dangerous goods;
- Shipment and receipt of packages containing dangerous goods from off-site consignors; and
- Preparation of the documentation required by the *Packaging and Transport of Nuclear Substances Regulations* [32] and *Transportation of Dangerous Goods Regulations* [31].

### 17.2 Future Plans

While CNL strategy to safely accelerate decommissioning, environmental remediation, and waste management, will result in a significant increase in shipments involving the TDG program, however the number of shipments from DPWF will not increase. Table 17-1 presents the summary of anticipated waste and shipments associated with the hazard reduction campaigns and decommissioning activities (within PE-A, B, and C) that will be carried out in the next proposed licensing period (2020-2034). The number of estimated shipments provided in Table 17-1 for the next proposed licensing period (2020-2034) will vary depending on the

volume reduction factor that will be achieved at the time of disposal considering ALARA principle.

**Table 17-1**
**Summary of Anticipated Radioactive Waste and Associated Shipments**

| Period | LLW | | ILW | |
|---|---|---|---|---|
| | Waste Amount | No. of Shipments | Waste Amount | No. of Shipments |
| 2020-2025 | 60 $m^3$ | 6* | 6 $m^3$ | 1** |
| 2026-2030 | 140 $m^3$ | 14* | - | - |
| 2031-2034 | <1 $m^3$/year*** | - | - | - |

* For estimation purpose it is assumed that each LLW shipment will carry 10 $m^3$ of waste.

** For estimation purpose it is assumed that each ILW shipment will carry t 6 $m^3$ of waste.

*** This will be mainly contaminated PPE&C produced due to the SWS activities.

The staff of the TDG program will continue to work with WM program staff, DPWF Decommissioning Projects staff, and all appropriate CRL staff to implement an efficient and effective program. This strategy will achieve an overall reduction of risk to members of the public, workers, and the environment.

## 18. OTHER MATTERS OF REGULATORY INTEREST

### 18.1 Indigenous Engagement

CNL initiated engagement with First Nation and Métis communities in 2019 October on activities related to the DPWF Decommissioning Project. These engagement activities with the Indigenous communities are ongoing and conducted in accordance with the CNSC Indigenous Engagement Regulatory Document REGDOC-3.2.2 [36]. CNL's engagement activities for First Nations and Métis communities include letters, phone calls, meetings, information sharing, facility tours, community outreach, and email correspondence. Through engagement activities, CNL seeks to understand the perspectives of each Indigenous community, exchange information, pursue meaningful participation, respond to any input received, and develop meaningful relationships with the First Nations and Métis communities.

Indigenous communities were engaged based on the identified potential or established Indigenous or treaty rights of First Nation and Métis communities in the vicinity of the DPWF decommissioning project. Table 18-1 provides a log of engagement activities.

**Table 18-1**
**Overview of the Indigenous Engagement Activities**

| Date | Event | Communities |
|---|---|---|
| 21-Oct-19 | Notification letter and information package (including link to DDP, licence amendment application and Quick Facts) sent to identified Indigenous communities | Chippewas of Nawash Unceded First Nation<br>Saugeen First Nation<br>SON Environment Office<br>MNO<br>HSM |
| 01-Nov-19 | Follow-up calls to identified Indigenous communities | HSM<br>MNO |
| 08-Nov-19 | Emails planning meeting between HSM and CNL | HSM |
| 13-Nov-19 | Follow-up emails between SON Environment Office and CNL | SON Environment Office |
| 21-Nov-19 | Emails planning meeting between MNO and CNL | MNO |
| 26-Nov-19 | Emails planning meetings between SON and CNL | SON Environment Office |
| 11-Dec-19 | Presentation and meeting between CNL and the HSM | HSM |
| 12-Dec-19 | Presentation and meeting between CNL and the MNO, Georgian Bay Traditional Territory Consultation Committee | MNO |
| 14-Jan-20 | Emails planning meeting and presentation with CNL and the SON | SON Environment Office |
| 06-Feb-20 | Emails sharing CNSC public notice for hearing dates | MNO<br>SON Environment Office<br>HSM |
| 11-Feb-20 | Emails sharing revised DDP | MNO<br>SON Environment Office<br>HSM |
| 26-Feb-20 | Meeting with HSM | HSM |
| 03-March-20 | Emails sharing revised EER, ERA and 2018 Annual Compliance and Monitoring Report | MNO<br>HSM |
| 04-March-20 | Email sharing revised EER, ERA and 2018 Annual Compliance and Monitoring Report | SON Environment Office |

| Date | Event | Communities |
|---|---|---|
| 09-March-20 | Meeting with the SON Environment Office | SON Environment Office |
| 20-March20 | Email sharing new hearing dates and postponing in-person engagements | MNO<br>SON Environment Office<br>HSM |
| 22-April-20 | Sharing of Indigenous Engagement Report with Indigenous communities | MNO<br>SON Environment Office<br>HSM |
| 01-May-20 | Sharing of two requested documents to support hearing participation | SON Environment Office |
| 12-June-20 | Emails sharing invitation to webinar on June 25, providing link to revised notice of hearing and offering community-specific webinar | MNO<br>SON Environment Office<br>HSM |
| 18-June-20 | Signed short-term contribution agreement with the HSM | HSM |
| 30-July-20 | Community Webinar with the HSM | HSM |
| 25-August-20 | Community Mail-Out to the HSM | HSM |
| 25-August-20 | Facility and site tour | SON Environment Office |
| 25-August-20 | Facility and site tour | SON Environment Office |
| 25-August-20 | Signed short-term contribution agreement with the MNO | MNO |

### 18.2 Cost Recovery

AECL/CNL is in good standing with respect to the provision of CNSC licensing fees, and will continue to provide all necessary fees, as and when required.

### 18.3 Financial Guarantees

While ownership of CNL has transferred to the CNEA, AECL retains ownership of the lands, assets, and liabilities associated with CNL's licences. These liabilities have been officially recognized by the Minister of Natural Resources in a letter dated 2015 July 31, as per the Licence Condition 2.2 (Financial Guarantee) of DPWF LCH. This recognition is reaffirmed by the AECL on 2020 August 12.

### 18.4 Public Information Program and Public Disclosure

The Public Information Program document is intended to cover communication activities that occur between CNL and its immediate neighbouring communities for all its sites including DPWF site. This document was prepared in accordance with CNSC regulatory document

*Public Information and Disclosure,* REGDOC-3.2.1 [37].

### 18.4.1 Information Material

CNL uses various communication modes to reach specific audiences (e.g., neighbouring communities, industry, customers, and employment prospects). All communication products are maintained and kept up to date; this includes the dedicated corporate website (www.cnl.ca), marketing materials, posters, advertisements, recruitment materials, and related products. CNL also makes material available through various social media outlets.

CNL continues to utilize numerous tools for advertising including targeted social media advertising to publicize community events and other opportunities to learn about CNL's activities such as DPWF Decommissioning Project.

Information material specifically for Douglas Point is available online at www.cnl.ca/dp, as well as through social media. Presentations on the project have been shared at council meetings for the Municipality of Kincardine and the County of Bruce. Each of these local governments made these presentations available online. Information on the DPWF Decommissioning Project was also made available through CNL's booth at the virtual Association of Municipalities of Ontario (AMO) conference August 17-19, 2020.

An online webinar was hosted on June 25, 2020, in which plans of DPWF Decommissioning Project were presented to the local communities. The video of this webinar was posted on YouTube and has garnered over 100 views. Furthermore, the readership of this webinar has reached over 30,000.

Information materials will also be shared through Virtual Open Houses, webinars, meetings with interested stakeholders and other, events such as online conferences and panel discussions. CNL continues to share additional information with the interested stakeholders upon their request.

### 18.4.2 Website

The corporate website www.cnl.ca informs the public on unique facilities and nuclear science and technology activities. The corporate website is a key part of the Public Information Program, and is used as a mechanism to highlight significant activities such as major projects, provide environmental performance reporting, event reporting, attract potential employees, maintain contact with staff, alumni, and to provide access to many publications and reports. This includes an archive of recent news releases.

CNL makes available, through its corporate website, a list of events reported to CNSC staff; this list is published within 60 days following the end of the preceding quarter. In addition to posting event titles, CNL also publishes voluntary disclosures for specific events.

Where reasonable, the website content is prepared in both official languages. Visitors to www.cnl.ca may contact CNL for more information through the "Contact Us" page.

Online content on www.cnl.ca includes the web page relating to the decommissioning of Douglas Point (www.cnl.ca/dp).

### 18.4.3 Social Media

CNL's social media accounts have become an integral part of communications with the public. Social media are utilized to disseminate information in a timely manner and are able to reach specific audiences through targeted boosting of selected messages. CNL's social media pages have developed the capacity to be a direct line to the public. CNL has activated LinkedIn, Flickr, YouTube, Facebook, Instagram, and Twitter accounts to further engage the public.

CNL is using these established company social platforms to inform communities on the DPWF Decommissioning Project. Information on the project, such as hearing dates and the sharing of local media coverage has been shared through Facebook, Instagram, Twitter and LinkedIn.

Table 18-2 provides details of social media engagement since October 2019:

**Table 18-2**
**Details of the Media Engagement**

| Social Media Platform | Posts | Engagement (Reactions, Comments, Shares, Impressions and Engagement) |
|---|---|---|
| Facebook | 8 | 1,380 |
| LinkedIn | 4 | 628 |
| Twitter | 7 | 5,975 |
| YouTube | 1 | 105 |

### 18.4.4 Douglas Point Decommissioning Project Public Inquiries

Since the launch of the application for final decommissioning of the DPWF (i.e. 2019 October), 21 individuals have made inquiries. Many of those inquiries expressed their interest in the project and/or the historic nature of the facility due to having worked at Douglas Point or having known someone who worked at Douglas Point. Other inquiries were information requests to support hearing interventions. CNL has responded to each inquiry and has shared all requested documents with the exception of one document consisting of sensitive information on the labour and cost.

### 18.4.5 Newsletters

*Voyageur* is an internal newsletter for CNL employees. It is focused on nuclear science and technology activities and accomplishments. *Voyageur* is distributed both electronically and in hard copy, and employees are welcome/encouraged to take the newsletter home and share it with others. *Voyageur* is also provided to a limited external audience along with a monthly package of relevant internal news that is issued to CNL alumni, a group of former employees and retirees. In 2019 November, a story on the plans to decommission Douglas Point was published in *Voyageur*.

### 18.4.6 Media Releases and Public Disclosures

CNL news releases issued through www.cnl.ca are sent directly to local media. Members of the local media are also on the CNL's email distribution list for Douglas Point and therefore receives updates directly. In accordance with the ongoing commitment to voluntary public disclosure of events related to CNL, three public disclosures were made in 2019. Note that none of those were related to the DPWF.

### 18.4.7 Media Coverage

Table 18-3 provides details of the media coverage events in support of DPWF Decommissioning Project. Note that there has been local media coverage regarding CNL's proposed decommissioning of DPWF and to date CNL staff have been interviewed three times by the local media.

**Table 18-3**
**Details of the Media Coverage Events**

| Date | Article Title | Media Outlet | Author | Web page |
|---|---|---|---|---|
| 06-Feb-20 | Original Douglas Point Nuclear Plant to be Removed | The Sun Times (Owen Sound) | Don Crosby | https://www.owensoundsuntimes.com/news/local-news/original-douglas-point-nuclear-plant-to-be-removed |
| 05-Feb-20 | Douglas Point to be Decommissioned | Bayshore broadcasting news centre | John Divinski | http://bayshorebroadcasting.ca/news_item.php?NewsID=115137 |
| 06-Feb-20 | Original Douglas Point Nuclear Plant to be Removed | The London Free Press | Don Crosby | https://lfpress.com/news/local-news/original-douglas-point-nuclear-plant-to-be-removed/wcm/c37512f0-ced3-4756-94a5-98ea746556a3 |
| 07-Feb-20 | Original Douglas Point Nuclear Plant to be Removed | Shoreline Beacon | Don Crosby | https://www.shorelinebeacon.com/news/local-news/original-douglas-point-nuclear-plant-to-be-removed-2 |
| 11-Feb-20 | First CANDU reactor to be decommissioned | My FM Shoreline Today | Gabe Butchert | https://shorelinetoday.ca/2020/02/11/first-candu-reactor-to-be-decommissioned/ |

| Date | Article Title | Media Outlet | Author | Web page |
|---|---|---|---|---|
| 13-Feb-20 | Hearing Set for Douglas Point Decommissioning | Bayshore broadcasting news centre | Megan Johnson | https://www.bayshorebroadcasting.ca/news_item.php?NewsID=115308 |

#### 18.4.7.1 Public Engagement and Outreach

CNL shares information with the public through a number of activities including conducting public information sessions, media releases, the corporate website, a toll-free line, social media accounts and involvement in community events. The CNL also engages with the public at a number of local, national, and international events.

Employee communication is another part of CNL's outreach. The CNL shares information with employees via the intranet and CNL's employee newsletter (*Voyageur*). The CNL began outreach on the decommissioning plans for Douglas Point in October 2019.

Engagements and events since then are listed below:

- Extended project-specific web content available at www.cnl.ca/dp, including a feedback form, an infographic, the recorded webinar, Quick Facts on the project, FAQs, and links to the CNSC website for public hearing related information such as Licence Amendment Application and Revised Notice of Hearing;
- Dialogue with other nuclear organizations who have operations regionally;
- Internally informing CNL employees (~3,000) via intranet;
- Informing Bruce Power employees (~4,000 individuals who live in the surrounding area) via internal email;
- Outreach via email to the Bruce Power Pensioners Association (~1,800 individuals);
- Presentations with the County of Bruce and the Municipality of Kincardine;
- Three interviews with local media outlets, which resulted in more than five instances of media coverage;
- Participation in the International Joint Commission Water Quality Board's Panel on Nuclear Decommissioning;
- Three emails sent to email distribution list; and
- Responses to greater than 21 inquiries.

Planned engagements for the next six months include the following:

- Virtual meetings with interested stakeholders including local government;
- Virtual Open Houses;
- Advertising;
- Community mail-outs;
- Virtual site tours;
- Webinars;
- Presentations to municipal councils and staff; and
- Participation in virtual events.

Outreach leading up to the hearing for the licence amendment application is also a requirement. To support this process, CNL has made information available (and continues to make information available) to CNL neighbouring communities and stakeholder groups through a variety of mechanisms (mentioned above) to ensure accessibility of fact-based information.

## 19. REFERENCES

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## 20. ACRONYMS

| | |
|---|---|
| **AECB** | Atomic Energy Control Board |
| **AECL** | Atomic Energy of Canada Limited |
| **ALARA** | As Low As Reasonably Achievable, economic and social factors taken into account |
| **AOO** | Anticipated Operational Occurrence |
| **BAA** | Bounding Accident Analysis |
| **CAP** | Corrective Action Plan |
| **CAN** | Canada |
| **CANDU** | Canada Deuterium Uranium (registered trademark) |
| **CMD** | Commission Member Document |
| **CEEA** | Canadian Environmental Assessment Act |
| **CNEA** | Canadian National Energy Alliance |
| **CNL** | Canadian Nuclear Laboratories |
| **CNSC** | Canadian Nuclear Safety Commission |
| **CRL** | Chalk River Laboratories |
| **CSA** | Canadian Standards Association |
| **CWSI** | Commercial Wireless Systems International |
| **DDPs** | Detailed Decommissioning Plans |
| **DPWF** | Douglas Point Waste Facility |
| **D&D** | Decommissioning & Demolition |
| **DPNGS** | Douglas Point Nuclear Generating Station |
| **DRL** | Derived Release Limit |
| **DPWMF** | Douglas Point Waste Management Facility |
| **ECIS** | Emergency Coolant Injection System |
| **EFDR** | Event Free Day Reset |

| | |
|---|---|
| **EIS** | Environmental Impact Statement |
| **EmP** | Emergency Preparedness (Program) |
| **ER** | Environmental Review |
| **ERA** | Environmental Risk Assessment |
| **ERM** | Environmental Remediation Management |
| **FHA** | Fire Hazard Assessment |
| **FP** | Fire Protection |
| **G1WF** | Gentilly-1 Waste Facility |
| **GoCo** | Government –Owned, Contractor-Operated |
| **HSSE** | Health, Safety, Security and Environment |
| **HSSE&Q** | Health, Safety, Security, Environment and Quality |
| **HU** | Human Performance (Program) |
| **IAEA** | International Atomic Energy Agency |
| **ImpAct** | Improvement Action (Process) |
| **ISO** | International Organization for Standardization |
| **LCH** | Licence Conditions Handbook |
| **LLW** | Low Level Waste |
| **LMP** | Life Management Program |
| **MAPLE** | Multipurpose Applied Physics Lattice Experimental (Reactor) |
| **MPF** | Molybdenum-99 Production Facility |
| **MS** | Management System |
| **MTC** | Modular Trailer Complex |
| **NFPA** | National Fire Protection Agency |
| **NM&SM** | Nuclear Materials and Safeguards Management |
| **NPARB** | Nuclear Performance Assurance Review Board |

| | |
|---|---|
| **NPDWF** | Nuclear Power Demonstration Waste Facility |
| **NSCA** | Nuclear Safety and Control Act |
| **OH** | Ontario Hydro |
| **OIC** | Officer-in-Charge |
| **OSH** | Occupational Safety and Health |
| **OPEX** | Operating Experience (Program) |
| **OPG** | Ontario Power Generation |
| **PCBs** | Polychlorinated Biphenyls |
| **PE** | Planning Envelope |
| **PreHA** | Preliminary Hazard Analysis |
| **PSW** | Provincially Significant Wetland |
| **REGDOC** | Regulatory Document |
| **RP** | Radiation Protection (Program) |
| **S&T** | Science and Technology |
| **SAR** | Safety Analysis Report |
| **SAT** | Systematic Approach for Training |
| **SCA** | Safety and Control Area |
| **SMR** | Small Modular Reactor |
| **SOW** | Scope of Work |
| **SSCs** | Structures, Systems, and Components |
| **SWS** | Storage With Surveillance |
| **TDG** | Transportation of Dangerous Goods |
| **TDGR** | Transportation of Dangerous Goods Regulations |
| **TLD** | Thermoluminescent Dosimeter |
| **ULC** | Underwriters Laboratories of Canada |

| | |
|---|---|
| **WFOL** | Waste Facility Operating Licence |
| **WMA** | Waste Management Area |
| **WMF** | Waste Management Facility |
| **WWMF** | Western Waste Management Facility |