

1160 Monaghan Rd. Peterborough, Ontario Canada

ANNUAL COMPLIANCE MONITORING REPORT

January 1- December 31 2024

The information contained in this report concerns the performance and operation of BWXT Nuclear Energy Canada Inc.'s (BWXT NEC) Class IB nuclear fuel facility located in Peterborough, Ontario. This report is prepared to meet nuclear fuel facility licence FFL-3620.00/2030 condition 3.2. The content demonstrates adherence to the BWXT NEC commitment to operate a safe Class IB nuclear fuel facility, as well as demonstrate compliance with applicable regulations and licence conditions specified by the Canadian Nuclear Safety Commission.

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1 EXECUTIVE SUMMARY

BWXT Nuclear Energy Canada Inc. (BWXT NEC) has been involved with the Canada Deuterium Uranium (CANDU®) industry from its earliest years. BWXT NEC produces nuclear fuel bundles used by the CANDU fleet to generate clean electricity that powers homes, business, and the Canadian economy. BWXT NEC operates in three plant locations: Arnprior, Toronto and Peterborough, Ontario. BWXT NEC's Toronto and Peterborough facilities are Class IB nuclear facility operations. The Licence issued by the Canadian Nuclear Safety Commission (CNSC) authorizes BWXT NEC to operate and modify its nuclear fuel facility to produce natural and depleted uranium dioxide (UO₂) pellets and to produce and test fuel bundles in Peterborough at 1160 Monaghan Rd. The facility is additionally authorized to receive, repair, modify and return contaminated equipment from off-site nuclear facilities.

The purpose of this annual compliance report is to demonstrate that BWXT NEC Peterborough has successfully met the requirements of the *Nuclear Safety and Control Act*, associated regulations, and the Class IB Nuclear Fuel Facility Licence FFL-3620.00/2030 issued by the CNSC on January 1, 2021, and expiring on December 31, 2030. This report is prepared based on the CNSC's regulatory document REGDOC-3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class 1 Nuclear Facilities and Uranium Mines and Mills*. Appendices containing confidential, proprietary, or prescribed information are submitted to the CNSC separately.

BWXT NEC is committed to continuously improving systems to protect employees, the environment, and communities against environmental, health and safety hazards. We work to implement programs to conserve natural resources, prevent pollution and minimize waste. Maintaining a safe and healthy work environment for our employees is a top business priority. BWXT NEC has implemented a business management system that defines the requirements for the licensed activity, which ensures applicable buildings and facilities, equipment, and processes used in support of licensed activities are conducted in accordance with the *Nuclear Safety and Control Act*, associated regulations, applicable CNSC requirements, jurisdictional requirements, and compliance best practices.

BWXT NEC has established CNSC accepted Action Levels for various radiological and environmental parameters. An Action Level is defined in the *Radiation Protection Regulations* as "a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's Radiation Protection Program, and triggers a requirement for specific action to be taken." Action Levels are also applied to environmental protection. Action Levels are facility-specific and set below regulatory limits; however, exceedances are CNSC reportable events. Accordingly, BWXT NEC has established Internal Control Levels for various radiological and environmental parameters that are set even lower than Action Levels to act as an early warning system. Internal Control Level exceedances result in internal investigation and correction and are not CNSC reportable events.

Employee workplace radiation exposures are measured by CNSC approved methods and systems. Overall, whole-body dose trends have remained steady over a five-year period, with skin, extremity, and eye dose slightly increasing. This is likely as a result of the introduction of the Sort and Stack workstation, leading to an increase in product handling. Dose reduction continues to remain a priority, with ongoing efforts towards shielding, material movement, improving ALARA awareness (e.g., use of leaded blankets on product), and Thermoluminescent Dosimeter (TLD) wear and storage compliance. All measured radiation exposures received by personnel in the reporting period were within regulatory limits, Action Levels, and Internal Control Levels.

BWXT NEC has established conventional health and safety programs to manage the nonradiological workplace safety hazards to protect personnel. Key performance indicators are used to



measure the success of the programs throughout the year. There were zero lost time injuries during the reporting period.

BWXT NEC recognizes that an effective way of maintaining public trust is to maintain environmental excellence. This requires a demonstrated commitment to operating in accordance with the highest environment, health, and safety standards. The facility maintains an effective environmental management system to achieve environmental goals and objectives and keep all environmental impacts well within applicable standards and as low as reasonably achievable. This program demonstrates compliance with relevant provincial and federal legislation. The environmental protection program is also compliant with the following standards:

- Canadian Standards Association (CSA) N288.6-12, Environmental risk assessments at Class I nuclear facilities and uranium mines and mills.
- CSA N288.5-11, Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills.
- CSA N288.4-10, Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills.

Air and water emissions are routinely measured to demonstrate compliance with the CNSC's environmental protection requirements and with the principle of keeping radiation exposure As Low As Reasonably Achievable (ALARA). Annual releases were a very small fraction of regulatory limits, and all measurements were below Action Levels. Soil samples were taken surrounding the Peterborough facility with all measurements within applicable guidelines.

An established emergency response plan is in place that describes the actions to be taken to minimize health, safety and environmental hazards to workers and local members of the public which may result from fires, or the release of hazardous materials. The plan intends to reduce the risk of emergencies such as fires and assist emergency staff and personnel in understanding key emergency response issues. The plan assists the facility in protecting employees, the local community, and the environment through sound emergency management practices. The emergency response plan was developed in accordance with CNSC Licence requirements.

BWXT NEC has implemented and maintains a Safeguards Program and undertakes all required measures to ensure safeguards implementation in accordance with International Atomic Energy Agency (IAEA) commitments and CNSC regulatory document REGDOC-2.13.1 *Safeguards and Nuclear Material Accountancy.* Movement (inventory changes) of natural and depleted uranium are documented and reported to the CNSC as required. The IAEA and the CNSC jointly conduct annual verifications.

BWXT NEC safely transports dangerous goods, including Class 7 radioactive material shipments as governed by the *Transportation of Dangerous Goods Act* and regulations and the *Packaging and Transport of Nuclear Substances Regulations*. Shipments occur routinely between suppliers and BWXT NEC's Toronto and Peterborough facilities, customers, and waste vendors.

BWXT NEC places great importance on its relationships with local indigenous communities, government, and residents in the communities in which it operates and works to ensure there is open communication and awareness of BWXT NEC's operating activities. The public information program defines the process for providing information about BWXT NEC operations. The Community Liaison Committee (CLC), whose mandate is to provide a forum for a cross-section of neighbours and other community stakeholders to share information and ideas, continued to meet regularly.





This compliance monitoring report demonstrates that BWXT NEC has successfully met the requirements of the *Nuclear Safety and Control Act*, associated regulations and CNSC Class IB Nuclear Fuel Facility Licence conditions.



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2 INTRODUCTION

The purpose of this compliance report is to demonstrate that BWXT NEC has successfully met the requirements of the *Nuclear Safety and Control Act*, associated regulations, and the Class IB Nuclear Fuel Facility Licence FFL-3620.00/2030 issued by the Canadian Nuclear Safety Commission (CNSC) on January 1, 2021, and expiring December 31, 2030. This report is prepared based on the CNSC's regulatory document REGDOC-3.1.2 *Reporting Requirements, Volume I: Non-Power Reactor Class 1 Nuclear Facilities and Uranium Mines and Mills*. Appendices containing confidential and proprietary information are submitted to the CNSC separately.

BWXT Nuclear Energy Canada Inc. (BWXT NEC) has been involved with the CANDU® industry from its earliest years. BWXT NEC produces nuclear fuel bundles used by the CANDU® fleet to generate clean electricity that powers homes, business, and the Canadian economy. BWXT NEC operates in three plant locations: Arnprior, Toronto and Peterborough, Ontario. BWXT NEC's Toronto and Peterborough facilities are Class IB nuclear facility operations. Nuclear substance use is regulated federally by the *Nuclear Safety and Control Act* and associated regulations through the CNSC.

The Peterborough facility is located within a mixed residential and industrial area in central Peterborough (Figure 1). The buildings are located on the existing General Electric (GE) plant complex. The licensed facility consists of four buildings: Building 21, 24, 26 and 28, which are leased from GE. Building 21 is a two-floor building and houses the uranium fuel bundle manufacturing operation on the first floor and office personnel on the second floor. Building 24 is a one floor warehouse used to store sealed radioactive material including completed uranium fuel bundles, drums of UO₂ powder, and contaminated equipment as required. Building 26 is principally a conventional fabrication and assembly operation. It also houses the main shipping and receiving docks for Building 26 and is directly accessible through Building 26.





Figure 1: BWXT NEC Peterborough



2.1 Processes and Materials

Fuel manufacturing operations involve the loading of fuel pellets into Zircaloy tubes, sealing, and welding of the tubes to produce fuel elements and the assembly of the fuel elements into fuel bundles. The basic assembly process is described in Figure 2 and shows the interconnections with the other BWXT NEC plants.



Figure 2: Fuel Bundle Fabrication Process

Although the CNSC Licence authorizes production of fuel pellets in Peterborough, subject to certain conditions, fuel pellet production does not currently take place in Peterborough. Fuel pellet production is performed at BWXT NEC's Toronto facility, in accordance with its Class IB Nuclear Fuel Facility Licence FFL-3621.00/2030.

In addition to fuel fabrication, contaminated equipment from off-site nuclear facilities may be periodically received at the facility for repair and/or modification. No contaminated equipment was received in the reporting period.

BWXT NEC is federally regulated for health and safety. The federal health and safety legislation is the *Canada Labour Code Part II* and the *Canada Occupational Health and Safety Regulations*. The *Canada Labour Code* is enforced by Employment and Social Development Canada. The purpose



of Part II of the *Canada Labour Code* is to prevent accidents and injury to health arising out of, linked with, or occurring in the course of employment. BWXT NEC is additionally regulated environmentally through municipal sewer use bylaws and provincially by the Ontario Ministry of the Environment, Conservation and Parks (MECP). The BWXT NEC facility is also regulated federally by Transport Canada.

BWXT NEC is committed to the establishment and continuous improvement of a healthy safety culture. Safety culture refers to the core values and behaviours resulting from a collective commitment by our Company's leaders and individuals to emphasize safety, quality, ethics, and security over competing goals to ensure protection of people and the environment. The Environment, Health and Safety (EHS) Mission Statement defines it as a top business priority to continuously improve our EHS systems to protect fellow employees, the environment, and our communities against known and potential environmental, health and safety hazards. The BWXT NEC management team reviews, prioritizes, and controls workplace hazards and ensures compliance with the pertinent regulatory requirements, applicable codes, and company policies.

The primary radiological hazard from uranium is the inhalation of UO₂ particles. A lesser radiological hazard exists in the form of low-level external gamma and beta radiation exposure to employees. Measurements are performed for various parameters to confirm hazards are mitigated. Measurements for airborne and surface traces of uranium are an indicator of process containment efficiency. Urine samples provided by employees are used to indicate if inhalation may have occurred. Whole body, skin, eye, and extremity dose measurements are conducted to demonstrate compliance with the dose limits specified in the *Radiation Protection Regulations* and the ALARA principle. All measurement results for employees were below regulatory limits and Action Levels.

Air and water emissions are routinely measured to demonstrate regulatory compliance and the ALARA principle. Annual releases were a small fraction of regulatory limits, and all measurements were below Action Levels.

Table 1 defines the acronyms used in this report.

Acronym	Definition
ALARA	As Low As Reasonably Achievable
ATS	Action Tracking System
BWXT NEC	BWXT Nuclear Energy Canada Inc.
CANDU®	CANadian Deuterium Uranium
CCAB	Canadian Council for Aboriginal Business
CCME	Canadian Council of Ministers of the Environment
CLC	Community Liaison Committee
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
CTS	Critical-to-Safety
DIV	Design Information Verification

Table 1: Definition of Acronyms



Acronym	Definition
dom	Disintegrations per minute – unit of measure for radioactivity
чрп	1 dpm = 0.017 disintegrations per second
EASR	Environmental Activity and Sector Registry
EHS	Environment, Health and Safety
EMO	Emergency Management Organization
FHA	Fire Hazards Analysis
HWIN	Hazardous Waste Information Network
IAEA	International Atomic Energy Agency
IEMP	Independent Environmental Monitoring Program
MECP	Ministry of the Environment, Conservation and Parks
MP	Member of Parliament
MPP	Member of Provincial Parliament
mSv	milliSievert – unit of measure for radiation dose
11130	1 mSv = 0.001 Sv = 1,000 μSv
NEW	Nuclear Energy Worker
PAR	Progressive Aboriginal Relations
PDP	Preliminary Decommissioning Plan
PIT	Physical Inventory Taking
PIV	Physical Inventory Verification
POI	Point of impingement
ppm	Parts per million
RPRA	Resource Productivity and Recovery Authority
SSC	Systems, structures and components
TEDE	Total Effective Dose Equivalent
TLD	Thermoluminescent Dosimeter
UO ₂	Uranium Dioxide
μSv	microSievert – unit of measure for radiation dose
WSC	$\mu_{SV} = 0.001 \text{ mSV} = 0.000001 \text{ SV}$
WSC	Workplace Safety Committee



3 SAFETY AND CONTROL AREAS

3.1 Operating Performance

The "Operating Performance" Safety and Control Area covers an overall review of the licensed activities.

BWXT NEC has successfully implemented and maintained a program for safe operation of the facility and that reflects the facility safety analysis. BWXT NEC has established essential documentation (as specified by the Business Management System) including procedures describing the program or system process and work instructions outlining the steps required to complete an individual or set of tasks. This includes the written work instructions for handling of radioactive materials by workers to ensure activities are conducted in a manner that is protective of workers, the public and the environment; as well as full and accurate records to show the acquisition of nuclear substances, inventory of all radioactive nuclear substances and the disposition of all nuclear substances acquired for use or processed by BWXT NEC.

Over the reporting period, BWXT NEC continued to operate in a manner that supports the company mission to continuously improve EHS systems to protect fellow employees, the environment, and communities against known and potential environmental, health and safety hazards. Operating performance is monitored with key performance indicators and program goals. Reporting of EHS-related concerns is encouraged through a rewards program. These are assigned and tracked to completion in the Gensuite® software system and is used as a measure of employee engagement. In accordance with EHS program requirements, internal audits and self-assessments are conducted routinely to assess conformance to internal and external requirements. Licensed activity audits and self-assessments are summarized in subsequent sections.

The BWXT NEC management team continued to review, prioritize, and control workplace hazards and ensure compliance with the pertinent regulatory requirements, applicable codes, and company policies. Facility operations continued routinely and safely. Fuel pellets were assembled into CANDU® reactor fuel bundles and were then safely shipped to customers. Plant personnel followed procedures satisfactorily, as reflected in internal and external audits, self-assessments, radiation surveys, contamination monitoring, air sampling measurements and other safety inspections. Details are provided in subsequent sections of this report. There were no Action Level exceedances during the reporting period. Additionally, there were no significant modifications made to the facility in 2024.

The President of BWXT NEC is responsible for all activities within the company. The various functional groups, such as EHS, Quality and Communications report directly or indirectly to the President. Senior management accountability for the effectiveness of the management systems is defined. The Director, EHS & Regulatory is responsible for the overall EHS program. The company organization structure is shown in Figure 3 below.



BWXT NEC - Senior Management Team



Figure 3: BWXT NEC Organization Structure

BWXT NEC Peterborough maintains five EHS related committees that review activities including proposed changes to ensure safe plant operations. They are:

- Health and Safety Policy Committee comprised of unionized workers and management to contribute to making the company as safe as possible by promoting health and safety awareness, and making recommendations to workers and management regarding policies and procedures for safe working practices.
- Workplace Safety Committee (WSC) comprised of unionized workers and management to prevent accidents and occupational illness by promoting health and safety awareness, and making recommendations to workers and management regarding safe work practices and monitoring health and safety issues until resolved.
- As Low As Reasonably Achievable (ALARA) Committee comprised of unionized workers and management to continuously improve the radiation safety program and implement ALARA practices where practical to ensure that radiation doses are as low as reasonably achievable.
- Beryllium Safety Committee comprised of unionized workers and management to continuously improve the beryllium safety program and reduce potential beryllium hazards to workers.
- Ergonomics Committee comprised of unionized workers and management to develop, monitor, and administer the ergonomic procedure and recognize, reduce and where possible eliminate physical and cognitive ergonomic risk factors.

3.1.1 Possession and Processing

All possession and processing limits, as specified in the CNSC facility Licence were met. Production data is proprietary and is provided separately to the CNSC in Appendix A.



Production shutdowns were scheduled throughout the year for engineering projects, equipment maintenance and continuous improvements. Shutdowns in the reporting period included three weeks in the third quarter, and one week in the fourth quarter.

3.1.2 Regulatory Inspections

Excluding safeguards related inspections, which are described in section 3.13 of this report, there were two regulatory inspections during the reporting period.

- 1. An inspection was completed in February, focused on the Fire Protection Program. Four non-compliances, and one recommendation were issued. The actions issued are related to storage, housekeeping, and integrity of fire separations.
- An inspection was completed in November, focused on the Public Information & Disclosure Program. One non-compliance (adding a contact name to the public disclosure section of the website and a PDF of the protocol), and six recommendations were issued. The actions are of low safety significance and focus on internal documentation and clarity of requirements.

When applicable, all corrective and preventative actions related to non-compliances are submitted to the regulator and tracked to closure.

3.2 Management System

The "Management System" Safety and Control Area covers the framework which establishes the processes and programs required to ensure that the organization achieves its safety objectives and continuously monitors its performance against these objectives, as well as fostering a healthy safety culture.

The management system is a set of policies and procedures designed to ensure applicable buildings and facilities, process equipment, and processes used in support of licensed activities are conducted in accordance with the *Nuclear Safety and Control Act* and associated regulations, applicable CNSC requirements, jurisdictional requirements, and compliance best practices. A graded approach is used in the application of the management system program elements, such that the requirements are applied in a manner commensurate with the safety significance of the licensed activity, system, component, or structure.

The management system is comprised of the following core program elements:

- 1. Organization and Responsibilities
- 2. Personnel Capability
- 3. Use of Experience
- 4. Work Planning Control
- 5. Work Processes Control
- 6. Verification
- 7. Problem Identification and Resolution
- 8. Corrective Action
- 9. Change Control
- 10. Document Control and Records
- 11. Audits



- 12. Management Self-Assessment
- 13. Management Program Review
- 14. Supply Chain

The President of BWXT NEC is responsible for all activities within BWXT NEC. Operations and the various functional groups, such as Environment Health and Safety, and Quality Assurance, report directly or indirectly to the President.

Senior Management accountability for the effectiveness of the management systems has also been defined. For example, the Quality Manager has been assigned the responsibility for monitoring and assessing the effectiveness of the business licensed activity management system and is responsible for identifying problems, initiating or recommending solutions, and confirming their implementation and effectiveness. The company senior management organization structure is shown in Figure 3.

The management system is fully implemented and compliant with CSA N286-12, *Management System* Requirements *for Nuclear Facilities*. All management system documentation required by Licence Condition 2.1 is in place. The EHS Policy establishes the direction for the management system. Continuous improvement is achieved through several review processes, including self-assessments, audits, and management reviews. There were no major changes to the management system or responsibilities during the reporting period.

BWXT NEC's corporate policy describes BWXT NEC's commitments to the establishment and continuous improvement of a safety culture. The safety culture refers to the core values and behaviors resulting from a collective commitment by BWXT NEC leaders and individuals to emphasize safety, quality, ethics, and security over competing goals to ensure protection of people and the environment.

BWXT NEC is committed to maintaining a strong safety culture and clearly states the expected safety culture behavior. For example, the promotion of a standard set of human error reduction tools for job-site workers and knowledge workers, which include:

- 1) Procedure Use and Adherence;
- 2) Questioning Attitude;
- 3) Situational Awareness;
- 4) Self-Checking.

BWXT NEC's commitment to a strong safety culture is measured by tools such as employee concerns, incident investigations, audits and self-assessments, use of experience and corrective action program metrics that measure the effects of safety culture improvements. External agencies such as the CNSC audit BWXT NEC operations against CSA standards, which include safety culture requirements (e.g., CSA N286-12).

In the reporting period, there were no major program changes. Where required, revised documents were submitted to CNSC staff in accordance with the requirements in the Licence Conditions Handbook.

3.2.1 Licensed Activity Related Self-Assessments

The Self-Assessment program governs a proactive process for self-critical, candid, and objective evaluation of performance by a functional area measuring their process performance against internal procedures, expectations, goals established from business plans or external benchmarking standards. The Self-Assessment Program is a management tool used to engage the workforce in



early and proactive detection of organizational or systematic weaknesses. It is a functional manager's opportunity to take a structured look at their own function. Self-Assessments help identify low level issues or trends for early resolution before more significant problems occur.

A Self-Assessment schedule is prepared annually and ensures that each program element is reviewed periodically based on a risk-related approach. A summary of self-assessments conducted in the reporting period is provided in Table 2. The identified deficiencies were of low consequence, such as: multiple Contractor Respirator Medical Clearance Forms are missing and the EHS Specialist and Facilities Manager need to obtain the missing records for any contractors currently approved to wear a respirator on site; Procedure EHS-P-E-3.0P, "Waste Management" requires revision to include the requirement for the record for subject waste 90-day limit to be retained at the subject waste storage location; and any changes to the stored subject waste need to be updated on the Resource Productivity and Recovery Authority (RPRA) online portal. Several opportunities for improvement were also identified, such as: EHS-P-E-3.0P procedure alignment with the change to online hazardous waste manifest creation and the use of the RPRA portal; the respirator fit testing cards require updating to include the 6-month respirator cartridge change out frequency, which was found to be industry best-practice; and adding a Gensuite Compliance Calendar task for the EHS Technician along with an update to the respirator cleaning logbook to lower the risk of missing the annual respirator inspection for infrequent respirator users. There were no systemic deficiencies identified. The assessed program elements were determined to be effective.

In addition to the Self-Assessment Program, routine compliance reviews are periodically completed against regulatory EHS requirements, such as general environmental, water management, safety management and emergency response.

Program Element	Number of Deficiencies and Opportunities for Improvement
Calibration	1
Change Control	1
Respiratory Protection	9
Procurement	1
Emergency Preparedness	0
Environment Protection	1
Waste Management	2
Total	15

3.2.2 Licensed Activity Internal Audits

Internal auditing is an independent, objective activity designed to add value and continuously improve programs. Periodic assessment of program effectiveness is conducted through systematic internal audits that are planned and carried out on behalf of management to measure performance, the effectiveness of the program element processes and to promote continuous improvement. An audit schedule is prepared annually. Table 3 provides a summary of internal audits conducted in the reporting period (2024). The two identified non-conformances were of low significance. A preventative maintenance task was found completed but three months late with no adverse



consequence. The other non-conformance was that the procedure of approving EHS preventative maintenance work orders did not involve the EHS function. All identified non-conformances were assigned and tracked to closure. There were no systemic deficiencies identified. The assessed program elements were determined to be effective.

In addition, a summary review of all the non-conformances is conducted as part of the management review to determine if any systemic deficiencies have been identified. Based on the review, continuous improvement opportunities are discussed and documented in meeting minutes with actions tracked to closure.

Audit Scope	Number of Non-Conformances
Document Control and Records	0
Environment Protection Program (Air)	0
Maintenance	2
Radiation Protection Program	0
Operating Experience (OPEX)	0
Total	2

Table 3: Summary of Internal Audits

3.2.3 Management Reviews

Management reviews for EHS program elements are conducted annually before the end of April to review the previous calendar year activities. The EHS management reviews encompass the following items:

- > Status and follow-up of actions from previous management reviews;
- Results of applicable external agency audits;
- Open regulatory compliance obligations;
- Results of "Reg Auditor" (Gensuite) compliance evaluations;
- Results of licensed activity management system internal and external audits (where applicable);
- Results of licensed activity management system management self-assessments;
- > Trends in non-conformances (Gensuite Action Tracking System items) for closure metrics;
- EHS related quality assurance program actions;
- > Trends in Incident and Measurement (Gensuite) items for root cause;
- Status of EHS training activities;
- Procurement process;
- Extent to which Environmental, Health and Safety and ALARA objectives and targets have been met;
- Radiation dose trends;
- Communications and changes in the needs and expectations of interested parties, including complaints;



- > Changing external and internal issues, including compliance obligations;
- Changes in risks and opportunities;
- > Opportunities for continuous improvement;
- Evaluation of the effectiveness and continuing suitability of the EHS Mission Statement and the Environment, Health and Safety Program, which includes the EHS management system and hazard prevention program.

The above inputs are reviewed to ensure continuing suitability, adequacy, and effectiveness of the management system. The criteria for these are:

- Suitable: Does the system satisfy the requirements and represent the best way of doing things for our business?
- > Adequate: Is the system fit for its current purpose?
- Effective: Does the system enable the right things to be done? Is it driving continuous improvement?

Formal meeting minutes are prepared. The previous management review of 2022 resulted in five actions that were formally issued for follow-up by the applicable functional lead(s) and were tracked to closure in the Action Tracking System (ATS). The review of 2023 held in April 2024 resulted in five Opportunities for Improvement, as follows: one involved a minor procedural revision to include Arnprior in the scope for annual management reviews; one involved formulating a plan for monitoring ATS closures; one involved implementing another visualization method to track ATS closures; one involved obtaining radiation dose data for NEWs working offsite to ensure dose is managed from an ALARA perspective; and lastly a revision of the employee training checklists in Fuel Assembly to include a review of the EHS Mission Statement. Overall, the implemented management system for the licensed activity program was considered suitable, adequate, and effectively implemented. Continuous improvement remains a priority.

3.3 Human Performance Management

The "Human Performance Management" Safety and Control Area covers activities that enable effective human performance, through the development and implementation of processes that ensure that BWXT NEC staff members are sufficient in numbers in all relevant job areas, and have the necessary knowledge, skills, and tools in place to safely carry out their duties.

The training program is outlined in the licensed activity management system manual, and businesswide training procedures. Qualifications and training requirements are identified, and personnel are given the appropriate training to ensure they are competent at the work they do. This training includes on-the-job training, radiation protection and safety risk assessment training. Workers only perform functions for which they are qualified. Compliance with regulatory training completion is a key performance indicator that is tracked throughout the year. Key EHS course completion details are provided in Table 4. Note: N/A indicates that zero employees required the course during the reporting period.

Course Name	% Complete	
911 Transition Training	100%	
Aerial Lift Practical	100%	



Course Name	% Complete
Aerial Lifts	100%
Authorized Person Security	100%
Back Safety and Injury Prevention 2.0 – Canada	100%
Compressed Gas Safety	100%
Confined Spaces 2.0 – Canada	100%
Electrical Hazards: Shock, Electrocution, Arc Flash & Arc Blast	100%
Electrical Safety 2.0 – Canada	100%
Emergency and Disaster Preparedness – Canada	100%
Emergency Response Awareness	100%
Ergonomics in the Workplace 2.0 – Canada	100%
Fall Protection Advanced	100%
First Aid (Standard)	100%
Hearing Conservation 2.0 – Canada	100%
Indoor Hoisting and Rigging – Canada	100%
Laser Safety – Canada	100%
Lockout Tagout (LOTO) Procedure	100%
Lockout Tagout (LOTO) Try-Out Demonstration	100%
Lockout/Tagout 2.0 – Canada	100%
Manufacturing Area Hazards Awareness (Includes Radiation, Beryllium, Asbestos, and General Health & Safety)	100%
Overhead Cranes Level 1 Practical	N/A
Overhead Cranes Level 2 Services & Practical	100%
Portable Fire Extinguisher Training (Practical)	91%
Portable Fire Extinguishers – Canada	*99%
Powered Industrial Truck Safety with Propane Handling	100%
Powered Walkie Stacker Safety	100%
PPE: Personal Protective Equipment 2.0 – Canada	100%
Radiation Instrumentation	100%
Respirator Selection Use and Care	N/A
Respiratory Protection 2.0 – Canada	100%



Course Name	% Complete
Security Awareness – Peterborough	100%
Slips, Trips, and Falls 2.0 – Canada	100%
Transportation of Dangerous Goods	100%
Uranium Transportation Emergency Response Assistance	100%
Workplace Harassment and Violence Overview	100%
Workplace Hazardous Materials Information System (WHMIS)	100%

*The courses that were less than 100% complete by December 31, 2024, were completed by January 31st, 2025.

Note: Portable Fire Extinguisher Training (Practical) is provided by Peterborough Fire Services annually. The target audience is trained annually on portable fire extinguisher theory and have had practical training in years past. The training is anticipated to occur again in 2025.

The Peterborough facility is staffed with a sufficient number of qualified workers as well as the minimum number of responsible people to carry on the licensed activities safely and in accordance with the *Nuclear Safety and Control Act* and associated regulations. EHS and other staff are available after business hours as needed through cell phones and paging devices.

3.4 Safety Analysis

The "Safety Analysis" Safety and Control Area covers the maintenance of the safety analysis which supports the overall safety case for the facility. The safety analysis is a systematic evaluation of the potential hazards associated with the conduct of an activity or facility and considers the effectiveness of preventative measures and strategies in reducing the effects of such hazards. The safety analyses utilize a combination of What-if Analysis, Hazards and Operability and Quantitative Risk Analysis and documents a systematic evaluation of hazards associated with the licensed facility.

Modifications to the facility are made in accordance with the business-wide Change Control program, which requires review of EHS parameters for new or modified facilities, processes, and new or relocated machinery, apparatus and equipment. Under this process, a proposed modification is screened for potential impact on the facility safety analysis. Where screening identifies a potential impact, a more detailed review of the proposed modification is conducted to identify if the change impacts a safety system, or the basis of the safety assessment (e.g., materials, quantities, locations, etc.). Third-party reviews or regulatory approvals are conducted as required. In this way, impacts on the safety analysis is validated and updated, where necessary.

During the reporting period, a five-year update of the safety analysis report was made. The safety analysis report concludes that the engineered and administrative controls provide protection over a broad range of operating conditions that both restricts the likelihood of events and adequately protects the public and environment. The safety analysis report is scheduled for a routine five-year update in 2029.



3.5 Physical Design

The "Physical Design" Safety and Control Area relates to activities that impact on the ability of Systems, Structures and Components (SSC) to meet and maintain their design basis, given new information arising over time and taking into account changes in the external environment.

Changes made to the physical facility, equipment, processes, procedures, or practices that could adversely affect product quality, employee health and safety, the environment, or the public as a result of the operation are assessed through the Change Control program. Any changes to the design basis are identified and assessed by key stakeholders through this program, including third-party reviews as required. Adequate mitigations are applied including modification of the proposed change, up to rejection of the proposed change.

During the reporting period, there were no modifications to the physical facility that altered the design basis.

3.6 Fitness for Service

The "Fitness for Service" Safety and Control Area covers activities that impact on the physical condition of SSCs to ensure that they remain effective over time. This includes programs that ensure all equipment is available to perform its intended function when called upon to do so.

A Critical to Safety (CTS) program is in place. CTS items are those hardware items that directly ensure the safety of workers, protection of the environment, or regulatory compliance in the following three categories:

- Equipment and infrastructure identified as Safeguard Measures in the Facility Safety Analysis Reports;
- Respiratory personal protective equipment; and
- > Instrumentation generating data to demonstrate Regulatory Compliance.

BWXT NEC documentation describes the CTS program for the production of nuclear fuel, including CTS items common to both business units, Fuel Manufacturing and Fuel Handling and Engineered Solutions. Equipment identified on the CTS list is governed by a number of assurance procedures.

The CTS program elements include the following:

- Process to identify CTS equipment;
- CTS inventory list revision control;
- Procurement controls governing ordering and incoming verification to confirm CTS equipment received matches the CTS equipment list requirements;
- Requirements in the established change management program to adequately capture new additions and ensure sufficient detailed review of changes to existing CTS equipment; and
- > The factors determining the preventative maintenance schedule of CTS Equipment.

The facility is using an asset management and preventative maintenance software system. Maintenance Connection®, a web-based maintenance management software for work order and asset management. Maintenance Connection assists BWXT NEC in efficiently managing preventative maintenance tasks as well as to control and identify maintenance on CTS and Criticalto-Quality assets and components. Preventative maintenance tasks on CTS equipment are designated in this system as described in the business wide *Enterprise Asset Management Program Procedure*.



Certain CTS tasks have associated immediate independent post-maintenance verification or testing. For example, independent verification is in place on the beryllium ventilation systems during filter changes.

All CTS tasks issued in the reporting period are closed. In the reporting period, 87% of CTS tasks issued were completed within 14 days of the target completion date.

Preventative maintenance is considered during the assessment of changes as part of the businesswide Change Control program. Additionally, in the event of a near miss, incident, injury, inspection or suggestion, the preventative maintenance program for related equipment is reviewed as applicable. As a result, during the reporting period, the following improvements were implemented:

- Development of an electronic database to replace outdated printers in beryllium coating area. The aging equipment becomes a failure risk as spares and consumables for the printers become scarce. This eliminates the need to conduct maintenance (preventative or otherwise) on the printers.
- Added tracking sheets to develop a life cycle for the Reprofile workstation. Any dismantled fuel elements are reprofiled using custom-machined mill heads which were only replaced after poor performance was noted. The life cycle data will now drive the replacement of mill heads instead of observation of degraded performance. This establishes a documented process for driving predictive tool changes.
- Unifying engineered sketch process with the rest of BWXT methodologies. This includes updated standardized labelling of all components to eliminate unfamiliar or unknown parts on hand. All new engineered components are recorded in a configuration database to associate them with each workstation and are engraved or otherwise marked with part numbers to simplify identification for all employees. This improves the speed at which preventative maintenance can be completed, assists in adding clarity to preventative maintenance instructions (as we may now refer to specific part numbers directly in Work Instructions and require Technicians to verify part numbers), improves traceability of inventory, and standardizes the communication/component language for operators, technicians, and engineering.

Managing aging means ensuring the availability of required safety functions throughout the service life of the plant, with account taken for changes that occur with time and use. Aging management applies to SSCs that can, directly or indirectly, have an adverse effect on the safe operation of the plant. The asset management program accounts for aging through the CTS program inspection, testing and maintenance tasks. These processes provide warning signs and initiate corrective and preventative maintenance activities. Items identified for replacement are assessed through the Change Control program.

The preventative maintenance program is periodically assessed through self-assessments and internal audits, discussed in section 3.2 of this report. Key performance indicators are in place and are routinely reviewed. The program is adequate and effective and is continually improved.

3.7 Radiation Protection

The "Radiation Protection" Safety and Control Area covers the implementation of the Radiation Protection Program, in accordance with the *Radiation Protection Regulations*. BWXT NEC has a well-established and effectively implemented Radiation Protection Program, which includes a commitment to ALARA and continuous improvement. The program addresses the radiation hazards associated with UO₂. This program ensures that surface/airborne contamination and radiation doses



to employees and the public are monitored and controlled. The Director, EHS & Regulatory, has oversight of BWXT NEC's Radiation Protection Program.

Internal radiation hazards exist in the form of loose uranium which may enter the body by inhalation, ingestion, or absorption. As a result, air monitoring is conducted at various workstations within the facility as appropriate. Workstation air monitoring is a key performance indicator that speaks to effective administrative and engineered controls. A respiratory protection program is in place in accordance with CSA Z94.4-18, *Selection, use, and care of respirators*. Additionally, surface contamination measurements (swipes) are conducted in manufacturing areas to monitor and reduce the amount of loose radioactive material available for potential internal exposure of employees. As these monitoring processes produce large quantities of data, trending of data is performed at least annually and reviewed by the ALARA Committee.

Additionally, urine samples are regularly provided by employees to indicate if inhalation may have occurred. Sampling frequency is once per three months, based on established criteria such as job function and worker location within the facility. Criteria which determine the frequency of urine sampling for an employee are documented in the Radiation Protection Program.

A second radiological hazard exists in the form of low-level external gamma and beta radiation doses to employees. Routine gamma surveys are conducted, and Nuclear Energy Workers (NEWs) are issued Thermoluminescent Dosimeters (TLDs) to measure whole body, skin, eye, and extremity dose to ensure compliance with the regulatory radiation dose limits and the ALARA principle. Dose results are reviewed by EHS staff on receipt from the licensed dosimetry service provider. In addition, the ALARA Committee reviews trending data from radiation monitoring results through routinely scheduled meetings and provides recommendations to improve ALARA implementation.

As external radiation hazards from the storage and use of radioactive materials may result in radiation doses to workers, routine gamma radiation surveys are conducted within the facility using real-time portable handheld radiation detectors. Measured dose rates are compared to established dose rate targets for a given area based on area classification and occupancy. When necessary, items are moved to alternative storage locations and/or shielded. Areas that appear routinely higher than target dose rates are investigated for permanent improvements, such as shielding or reconfiguration.

A component of the Radiation Protection Program is area classification. Areas of the facility are classified into four different categories for the purpose of controlling the spread of radioactive contamination and ensuring appropriate engineered and administrative controls are in place. These classifications are defined in the *Radiation Protection Manual* as follows:

- Unclassified Area these areas do not involve nuclear substances and are considered public domain. Incidental contamination does not exceed the unclassified area Internal Control Levels.
- Active Area these areas are designed for handling materials with loose contamination that is potentially above unclassified area Internal Control Levels. External radiation hazards are not of significant concern.
- R1 Area these areas are designed for operations where only external radiation is of concern, and loose contamination is below R1 Area Internal Control Levels.
- R2 Area these areas are designed for operations involving exposed non-dispersible nuclear substances, where external radiation is of concern and loose contamination may be above R1 Internal Control Levels.



BWXT NEC has established CNSC accepted Action Levels for various radiological and environmental parameters. An Action Level is defined in the *Radiation Protection Regulations* as "a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's Radiation Protection Program, and triggers a requirement for specific action to be taken."

Action Levels are established in accordance with the CNSC regulatory document G-228, *Developing and Using Action Levels*, which are accepted by the CNSC and specified in the Licence Conditions Handbook (refer to Table 5). Although Action Levels are set below regulatory limits, exceeding an Action Level is considered a CNSC reportable event in which BWXT NEC must notify the Commission within 24 hours of becoming aware that an Action Level has been exceeded. Accordingly, BWXT NEC has established Internal Control Levels for various radiological and environmental parameters that are set even lower than Action Levels to act as an early warning system. An Internal Control Level exceedance results in internal investigation and corrective and preventative action. During the reporting period, all measurements were below Internal Control Levels, Action Levels and regulatory limits.

Nuclear Energy Worker	Period	Action Le	vel (mSv)	
Effective dose	Quarter of a year	4.0		
Effective dose	1 year	12.0		
Effective dose	5 years	60.0		
Skin dose	1 year	100		
Extremity dose	1 year	200		
Pregnant NEW	Balance of the pregnancy	3.5		
Parameter Acti		Action	Level	
Urinalysis		10 µg/L for any period		
Nuclear Substance and Form	m Action Level			
Uranium in Airborne	Unclassified Area	R1 Area	R2 Area	
Contamination	12 dpm/m ³	12 dpm/m ³	36 dpm/m ³	

Table 5: Summary of Action Levels	for the Radiation Protection	Program
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BWXT NEC has a well-established integrated management system for environmental, health and safety program excellence. The Radiation Protection Program is effectively implemented. BWXT NEC has an established *EHS Mission Statement* that is reviewed and signed annually by the President of BWXT NEC. The *EHS Mission Statement* includes a commitment to ALARA and continuous improvement. Elements of the Radiation Protection Program such as dose monitoring, contamination monitoring, and radiation field surveys, etc. are conducted by qualified workers and reviewed internally by EHS staff and Committees on a regular basis. Details of the reviews are recorded in meeting minutes.

An internal audit and self-assessment of the Radiation Protection Program, with a focus on elements of Radiation Protection Program effectiveness and compliance, are conducted routinely. Non-conformances are addressed and tracked to completion in accordance with program requirements.



In accordance with the *Radiation Protection Regulations* and CNSC Guidance Document G-129, *Keeping Radiation Exposures and Doses As Low As Reasonably Achievable*, BWXT NEC has implemented a Radiation Protection Program. This document establishes the Radiation Protection Program in place and identifies corresponding procedures to ensure that radiation exposures and doses are kept ALARA.

Key components of the Radiation Protection Program include:

- Compliance with all relevant regulatory requirements;
- The setting of ALARA goals and objectives;
- > Hazard recognition, risk assessment and change control processes;
- > A comprehensive worker training program; and
- Documented safety concerns, near misses and incidents with appropriate root-cause analysis, preventative and corrective actions.

The Radiation Protection Program includes all worker radiation safety elements that demonstrate compliance with relevant regulations, codes, and standards:

- EHS policy commitment to ALARA,
- Area classifications and requirements,
- Material handling,
- Non-routine or high-risk work controls,
- > Internal and external radiation hazard assessments, and
- Internal and external radiation monitoring and recording.

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, near miss and incident investigations, self-assessments, and internal and external audits. There were no major changes to the Radiation Protection Program during the reporting period. Minor continuous improvements were instituted as follows:

- The Thermoluminescent Dosimeters work instruction was revised to incorporate instructions for eye dose monitoring.
- The Radioactive Waste Management work instruction was revised to include the use of the ALARA principle for the safe handling and disposal of radioactive waste.

The Radiation Protection Program is well-established and effective. Effective whole-body dose trends have remained steady over the past 5 years, while skin, extremity, and eye equivalent doses are trending with a slight increase. These increases are likely the result of the addition of the Sort and Stack workstation, which has resulted in an increase of product handling. The company maintains its commitment to ALARA. Dose reduction continues to remain a priority, with ongoing efforts towards shielding, material movement, improving ALARA awareness (e.g., use of leaded blankets on product), and TLD wear and storage compliance. Program goals are monitored through the site's ALARA Committees as summarized in section 3.7.1.

3.7.1 ALARA Committee Performance

The ALARA Committee works to review and continuously improve elements of the Radiation Safety Program and implement ALARA practices where practical in order to ensure that radiation dose levels are as low as reasonably achievable. Committee members consist of both unionized and





management employees. The ALARA Committee targets quarterly meetings; in 2024 the committee met four times during the reporting period. Dose results, radiation protection related events, audits, and employee concerns were reviewed and discussed. Actions are assigned and tracked as part of the meeting minutes. Committee activities are communicated to all workers via email distribution and employee notice board postings.

ALARA Committee goals and results for the reporting period are provided in Table 6. Goals that are not achieved are reviewed by the ALARA Committee to discuss probable causes. The feasibility of achievement is discussed, and implementation plans revised as needed. As radiation doses continue to be well below the regulatory dose limits, dose reductions become increasingly challenging.

All three of the Committee goals were achieved this year. TLD audits are conducted periodically to ensure workers are wearing and storing their dosimeters as required to ensure accurate measurements. Overall, the site achieved 99.8% compliance which demonstrates a strong adherence to requirements. A shielding project at final inspection was completed, this project is expected to expand in 2025. The area around the fuel rack was painted and marked as a 'higher dose area' to improve visual awareness for employees, contractors, and visitors.

The results of swipes, air sampling, urinalysis, gamma surveys and radiation dose monitoring were reviewed with the Committee. No areas of concern were noted. Monitoring continues in accordance with the Radiation Safety Program requirements.

2024 ALARA Committee Goals	Actual	Result
>99% compliance in TLD audits	99.8%	Achieved
Complete final inspection shielding project	Complete	Achieved
Improve visual awareness and paint area around fuel rack	Complete	Achieved

Table 6: ALARA Committee Goals and Results

2025 ALARA Committee goals are established as follows:

- 1. >99% compliance in TLD audits.
- 2. Review a section of the regulations and/or internal program at each meeting.
- 3. Complete a session of ALARA training for the committee in addition to the quarterly meetings.
- 4. Improve the layout and housekeeping for the QA bench in the R2 Area.

3.7.2 Radiation Protection Training Program and Effectiveness

Radiation protection training programs are compliant with the Systematic Approach to Training (SAT) methodology. An internal or external specialist in radiation protection periodically provides classroom training to new and continuing NEWs or those working in areas with radioactive materials. Online training is also available to employees with computer access. Testing is performed on completion of the training to demonstrate employee understanding. Radiation protection training is rolled into the site-wide Manufacturing Area Hazards Awareness course. Course content includes general shop floor rules, radiation fundamentals, sources of ionizing radiation, health effects, emergency response and other safety-related content. Training completion is monitored using a learning management software system, which tracks and triggers retraining as required. Course completion details are



provided in section 3.3. Training effectiveness is monitored through radiation dose results, internal inspections, self-assessments, and audits as well as incident investigations.

3.7.3 Radiation Device and Instrumentation Performance

Radiation detection instrument error can occur due to a variety of factors: drift, environment, electrical supply, addition of components to the output loop, process changes, etc. The facility maintains a system for managing radiation detection instrument calibrations. Calibration is conducted to ensure accurate indication during field use. Calibrations are performed under environmentally controlled conditions suitable for the inspections, measurements, and tests being performed, as determined by the equipment manufacturer. Calibration intervals are established, so that calibration occurs before any anticipated significant changes occur in measurement capability. Radiation detection equipment calibrations are conducted within 12 months of the previous calibration as required by regulation.

All active radiation devices and instruments were maintained in a state of safe operation. Where calibration is expired or where detectors fail calibration, they are removed from service until they are repaired and meet radiation calibration expectations.

There were no changes to the calibration program during the reporting period.

3.7.4 Contamination Control Data

When radioactive material is handled in a non-sealed container, there is the potential for it to be spread onto other objects. This is known as radioactive contamination. Radioactive contamination refers to small amounts of nuclear substances on surfaces or within the air, where its presence is unintended or undesirable.

Surface contamination measurements (swipes) are conducted in manufacturing areas of the facility. Contamination by itself is not necessarily an indicator of exposure potential but can be used as an indicator of housekeeping conditions; however, significant amounts of loose surface contamination have the potential to become airborne. If this occurs, the air monitoring results will reflect increased airborne concentration, and appropriate corrective action is then taken. Internal Control Levels are applied to each area classification. In the event a swipe measurement exceeds an Internal Control Level; the area is cleaned and re-swiped to verify cleanliness. Trends are monitored. There were no significant personnel contamination events during the reporting period.

Routine surface contamination measurement results are summarized in Table 7. Surface contamination remains low. Surface contamination results are reviewed by EHS staff and discussed, if necessary, at ALARA Committee meetings. Overall, 98.6% of routine swipes were within Internal Control Levels, indicative of effective contamination control measures and cleaning schedules.

Eighteen of the exceedances for 2024 occurred in the R2 Area: sixteen were at the Sort and Stack location, one at the QA bench, and one on a tote cart. In all instances, the area was cleaned and reswiped to ensure contamination was cleaned and not spread elsewhere. The majority of the Internal Control Level exceedances at the Sort and Stack location occurred in the first quarter of 2024. Increased cleaning frequencies and the replacement of an ergonomic mat resolved persistent contamination issues. The R2 Area is rigorously cleaned and is expected to have potential surface contamination. Two of the exceedances occurred in the unclassified area, in both instances it was the floor outside of the entry/exit to the R2 area. These exceedances occurred in weeks where cleaning staff were limited due to illness and/or vacation. The importance of cleaning in this area has been communicated with the team.



Surface Contamination							
Clossification			2023		2024		
and Area Description	Control Level	Number of Samples	Number Samples Exceeding Internal Control Level (%)	Number of Samples	Number Samples Exceeding Internal Control Level (%)		
R2 – Pellet Loading, Element Welding and Pellet Storage	2,200 dpm /100 cm²	739	10 (1.4%)	661	18 (2.7%)		
R1 – Bundle Assembly, Inspection, Receiving, Building 24	220 dpm /100 cm ²	129	0 (0%)	117	0 (0%)		
Active – Met Lab, Waste Room	220 dpm /100 cm²	91	0 (0%)	84	0 (0%)		
Unclassified – Items, Main Hallway	220 dpm /100 cm²	540	0 (0%)	518	2 (0.4%)		

Table 7: Summary of Surface Contamination

3.7.5 Air Monitoring

As part of a well-established and implemented industrial hygiene program, breathing air is sampled for measurement of uranium content. Workstation air monitoring is a key performance indicator that speaks to effective administrative and engineered controls. A respiratory protection program is in place. Non-routine work functions, such as machine maintenance, modifications, etc. are controlled by EHS Work Permits. These processes specify protective measures, including those to reduce exposure to airborne UO₂. This may or may not include air monitoring and/or respirator use.

Each process workstation where open UO_2 pellets are handled are periodically monitored during routine operations for airborne UO_2 . Filter papers are analysed in-house and verified by an independent external laboratory using delayed neutron activation analysis. Workstation air sampling results are summarized in Table 8. Both the maximum and the average workstation air monitoring results continue to remain well below Internal Control Levels, with the average concentration increasing since the introduction of the Sort and Stack operation. In 2024 the number of different workstations sampled was reduced to three, this was a result of less workstations being in use for production throughout the year compared to past years.



Workstation Air Monitoring		2021	2022	2023	2024
Number of Different Workstations Sampled		6	6	5	3
Total Number of Samples Collected		81	46	64	46
Total Number of Samples Exceeding Internal Control Level (facility and area specific)		0	0	0	0
Total Number of Samples Exceeding Action Level (facility and area specific)	0	0	0	0	0
Average Concentration (dpm/m ³)		0.09	0.19	0.25	0.43
Maximum Value Recorded (dpm/m ³)	0.17	0.67	0.85	8.52	2.44

Table 8: Workstation Air Monitoring Summary

3.7.6 Facility Radiological Conditions

Radiation fields from use and storage of radioactive materials may result in external radiation doses to workers. To ensure that radiation dose rates are ALARA, routine gamma radiation surveys are conducted periodically using calibrated portable handheld radiation detectors. Measured dose rates are compared to targets for areas based on area classification and occupancy. When necessary, items are moved to alternative storage locations and/or temporarily shielded. Areas that appear routinely higher than target dose rates may be investigated for improvements, such as permanent shielding or reconfiguration. Routine dose rate measurements are summarized in Table 9. Dose rates remain low and stable. The gamma surveys focus on radioactive material handling and storage areas and adjacent occupied locations. Variability due to the timing of the surveys is a factor in the results, as production levels and movement of materials vary over the course of a day.

Gamma Dose Rates		2021	2022	2023	2024
Total Number of Locations Surveyed	366	361	380	417	357
Average Dose Rate (μ Sv/h) on Shop Floor	2.7	3.1	2.7	3.7	3.6
Average Dose Rate (μ Sv/h) in Storage Areas	4.3	5.5	4.6	4.9	5.7

Table 9: Routine Dose Rate Survey Summary

3.7.7 Urinalysis Results

The presence of uranium in the urine is an indication of recent inhalation of UO₂ dust or the systemic clearance of an established thorax burden. At BWXT NEC, urinalysis is used as a screening tool to initiate further review of internal dose control measures and practices but is not used to estimate internal dose.

All employees working where exposed UO_2 material is processed (R2 classified area) for a period greater than 30 hours per quarter, or working as a roving inspector during the quarter, submit urine samples for uranyl ion analysis. Samples are analyzed by an external laboratory for uranium content using Inductively Coupled Plasma – Mass Spectrometry (ICP-MS) with a minimum detectable concentration of 0.1 µg uranium per Litre (U/L). Results are compared to Internal Control Levels and Action Levels and entered and retained in an electronic database. Urinalysis results are summarized in Table 10.



Of all urinalysis samples processed between 2005 and 2024, <1% of samples (19/2383) have measured above the minimum detectable concentration of 0.1 μ g U/L. These occurrences were well below the Internal Control Level of 5 μ g U/L. This confirms that the inhalation hazards at the facility are negligible and that current engineered and administrative controls, where applicable, are effective.

Urinalysis	2020	2021	2022	2023	2024
Number of urine samples analyzed	86	103	105	110	101
Number of samples above Internal Control Level (5 µg U/L)	0	0	0	0	0
Number of samples above Action Level (10 µg U/L)	0	0	0	0	0
Maximum result (µg U/L)	0.4	0.1	0.2	0.1	0.9

Table 10: Urinalysis Results Summary

3.7.8 Radiation Doses

Radiation dose refers to the energy deposited or absorbed in materials through which it passes. Equivalent dose is used to assess how much biological damage is expected from the absorbed dose. It takes the properties of different types of radiation into account. Effective dose is used to assess the potential for long-term effects that might occur in the future. It is a calculated value, measured in millisieverts (mSv), which takes into account the absorbed dose to all organs of the body, the relative harm level of the type of radiation, and the sensitivities of each organ to radiation. All radiation exposures received by employees in the reporting period were within the Internal Control Levels, Action Levels and regulatory limits. Action Levels are site specific and are accepted by the CNSC through the Licence Conditions Handbook. Regulatory limits are specified in the Radiation Protection Regulations. Regulatory limits are listed in Table 11 and Table 12.

Effective Dose Limits					
Person	Period	Effective Dose (mSv)			
NEW, including a pregnant NEW who has yet to disclose pregnancy status	(a) One-year dosimetry period(b) Five-year dosimetry period	50 100			
Pregnant NEW	Balance of the pregnancy	4			
A person who is not a NEW (i.e., a member of the public)	One calendar year	1			



Equivalent Dose Limits					
Organ or Tissue	gan or Tissue Person Period		Equivalent Dose (mSv)		
Lens of an eve	(a) NEW	One-year dosimetry period	50		
(b) Any other pers		One calendar year	15		
Skin	(a) NEW	One-year dosimetry period	500		
	(b) Any other person	One calendar year	50		
Hands and feet	(a) NEW	One-year dosimetry period	500		
	(b) Any other person	One calendar year	50		

Table 12: Regulatory Equivalent Dose Limits

All workers are classified as either NEWs or non-NEWs. All NEWs are deemed to have a reasonable probability of receiving a dose of radiation that is greater than the prescribed limit for a member of the public (1 mSv/year) in the course of the person's work with nuclear substances or at our nuclear facility. All Fuel Manufacturing NEWs are assigned personal passive dosimeters known as TLDs (Thermoluminescent Dosimeter). These passive dosimeters measure the whole body and skin doses received in each monitoring period and are analyzed by the licensed dosimetry provider to calculate an eye lens dose. TLD rings are worn on certain employee's hands for a one-week period each quarter. The test results and the weekly hours of contact are used to estimate the extremity dose for that quarter. TLDs are exchanged quarterly and analyzed by a CNSC licensed external dosimetry service provider. The dosimetry service provider reports the measured doses to BWXT NEC and to the Health Canada National Dose Registry. On receipt, knowledgeable staff reviews the monitoring results, and compares them to associated Internal Control Levels, Action Levels and regulatory limits. During the first quarter an extremity study took place where employees assigned extremity rings wore them fulltime for the duration of the first quarter. This was a continuation of the study from the fourth quarter of 2023.

The annual dose assignment for employees consists of external dosimetry inputs, for which dose summaries are tracked for quarterly, year-to-date, five-year and lifetime. All NEWs who are monitored for radiation exposure receive an annual dose letter identifying their annual dose.

Dosimetry results are summarized in the following sub-sections. Employees are divided into workgroups based on job function for dosimetry analysis and trending. Operators are employees who directly manufacture product. Technicians are employees who support the licensed activities, (Fuel Manufacturing or Fuel Handling and Engineered Solutions), e.g., electrical, mechanical, quality control, laboratory, etc. Staff includes management and professional employees who support the operation and includes the Customer Site Representatives.



3.7.9 Total Effective Dose Equivalent

Total Effective Dose Equivalent (TEDE) includes TLD monitored external dose. As a result of operations involving sintered ceramic pellets, the facility does not have any measurable internal dose; therefore, the TEDE is the measured TLD external whole-body dose. Table 13 provides a summary of TEDE dosimetry measurements with monitored workers grouped in various ranges of exposure. Approximately 64% of TEDE are less than 1 mSv.

Voor	Total #	Total # of Individuals in Dose Range (mSv)								
rear Ir	Individuals	0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500	
2024	67	43	17	7	0	0	0	0	0	
2023	79	53	21	5	0	0	0	0	0	
2022	69	47	17	5	0	0	0	0	0	
2021	73	50	16	7	0	0	0	0	0	
2020	72	53	14	5	0	0	0	0	0	

Table 13.	Total Effective	Dose Fr	nuivalent	Distribution
Table 13.		DOJE LU	Juivalette	Distribution

TEDE by workgroup over the last 5 years is listed in Table 14. The average dose results include zero measurements.

	Year	All Workgroups	Operators	Technicians	Staff
(\)	2024	8.57	8.57	1.53	0.86
Sm)	2023	6.78	6.78	1.72	0.79
m	2022	7.65	7.65	1.45	0.62
axim	2021	9.83	9.83	1.42	0.78
Ma	2020	6.51	6.51	1.36	0.35
(2024	1.59	2.53	0.67	0.26
ge 'son	2023	1.43	2.28	0.65	0.25
/per	2022	1.29	2.18	0.51	0.15
Av mSv	2021	1.38	2.51	0.48	0.22
Ξ	2020	1.12	2.05	0.31	0.07

Table 14: Total Effective Dose Equivalent Summary



The trends for maximum and average TEDE for all monitored individuals is shown in

Figure 4. The total collective dose for 2024 was 106.7 mSv. The average TEDE has trended upwards which can be attributed to increased product handling, the introduction of Sort and Stack in 2021, as well as staffing challenges.



Figure 4: 5-Year Maximum and Annual Total Effective Dose Equivalent

The maximum individual five-year dose listed in Table 15 is on track to be well below the 100 mSv regulatory limit and the 60 mSv Action Level, with four years of dose thus far. Dose reduction continues to remain a priority, with ongoing efforts towards shielding, material movement, improving ALARA awareness (e.g. use of shielding blankets on product), and TLD wear and storage compliance.



	Year	All Workgroups
	2021-2025	29.31
mun idua Sv)	2016-2020	23.34
laxil ndiv (m;	2011-2015	35.61
2 2	2006-2010	31.91

Table 15: Maximum Individual Dose for CNSC 5-Year Range

3.7.10 Equivalent Skin Dose

TLDs measure the skin doses received in each monitoring period. Skin dose is the measure of the radiation dose that is absorbed by the skin from the deposition of energy from low penetrating radiation. Table 16 provides a summary of equivalent skin dosimetry measurements with monitored workers grouped in various ranges of exposure. Approximately 55% of skin doses are less than 1 mSv. Equivalent skin dose by work group is summarized in Table 17. The average annual skin dose trend for all monitored individuals is shown in Figure 5. Skin doses have remained relatively stable, with no significant increase or decrease in the average dose. With the introduction of the Sort and Stack workstation in 2021, there was an increase in the maximum dose due to increased product handling. The equivalent skin dose continues to remain a fraction of the regulatory limit and Action Level.

Voor	Total # Total # of Individuals in Dose Range						se Range (mSv)	
rear	Individuals	0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500
2024	67	37	14	4	11	1	0	0	0
2023	79	47	15	5	9	3	0	0	0
2022	69	41	12	6	9	1	0	0	0
2021	73	39	18	3	12	1	0	0	0
2020	72	49	8	4	11	0	0	0	0

 Table 16: Skin Radiation Dose Equivalent Distribution



	Year	All Workgroups	Operators	Technicians	Staff
(V)	2024	25.76	25.76	1.97	1.59
(mS	2023	25.15	25.15	1.98	1.60
m	2022	21.67	21.67	1.94	1.85
axim	2021	30.87	30.87	1.97	1.66
Ň	2020	19.01	19.01	2.12	0.37
(2024	3.69	6.17	0.91	0.43
ge son	2023	4.11	7.11	0.84	0.41
/per	2022	3.50	6.26	0.74	0.29
Av mSv	2021	3.64	7.02	0.66	0.38
5	2020	2.81	5.37	0.45	0.08

Table 17: Skin Radiation Dose Equivalent Summary



Figure 5: 5-Year Maximum and Average Skin Dose Equivalent



3.7.11 Equivalent Extremity Dose

TLD rings are worn on certain individual's hands for a one-week period each quarter to measure extremity dose. A scaling factor is calculated based on hours worked in the quarter and is provided to the dosimetry service provider each monitoring period. The dosimetry service provider applies the scaling factor to the measured dose to estimate the exposure for the quarter. A study had started in the fourth quarter of 2023 and was continued into the first quarter for 2024. Workers in the first quarter wore their extremity rings full time. Table 18 provides a summary of equivalent extremity dosimetry measurements with monitored workers grouped in various ranges of exposure. All extremity doses were under 50 mSv for 2024. Equivalent extremity dose by work group is summarized in Table 19. Staff and Technicians do not routinely participate in the extremity monitoring program since there is minimal direct handling of product. The average annual extremity dose trend for all monitored individuals is shown in Figure 6. The extremity doses have remained relatively steady on average over the past five years.

Veer	Total #		Total # of Individuals in Dose Range (mSv)							
rear	Individuals	0 - 1	1 - 5	5 - 10	10 - 20	20 - 50	50 - 100	100 - 200	200 - 500	
2024	22	2	3	4	3	10	0	0	0	
2023	21	1	5	4	5	7	1	0	0	
2022	23	2	4	2	7	7	1	0	0	
2021	19	1	1	2	8	4	3	0	0	
2020	18	0	2	3	7	6	0	0	0	

Table 18: Total Extremity Dose Equivalent Distribution

	Year	All Workgroups	Operators	Technicians	Staff
(\)	2024	40.3	40.3	N/A	N/A
(mS	2023	63.8	63.8	N/A	N/A
unu	2022	52.01	52.02	0.4	N/A
axin	2021	59.00	59.00	N/A	N/A
Ň	2020	43.17	43.17	N/A	N/A
(2024	17.58	17.58	N/A	N/A
ge son	2023	18.39	18.39	N/A	NA
/per	2022	15.63	16.32	0.4	NA
A MSv	2021	23.70	23.70	N/A	NA
Ĵ	2020	18.77	18.77	N/A	N/A

Table 19: Extremity Dose Equivalent Summary



Figure 6: 5-Year Maximum and Average Extremity Dose

3.7.12 Equivalent Lens of an Eye Dose

Equivalent eye lens dose is measured using the whole body TLD. The dosimetry provider calculates the eye dose Hp(3), using the results from the multiple elements within the TLD. All workers wear safety glasses, which helps to shield against the beta radiation that contributes to eye lens dose.

The regulatory limit for a NEW is 50 mSv, shown in Table 12. Currently there is no Action Level in place at Peterborough for eye lens dose. An Internal Control Level was set at 4.25 mSv/quarter. The maximum dose for the year was 8.79 mSv and the average dose amongst all workgroups was 1.86 mSv. In 2024 all eye lens equivalent doses were under the regulatory limit and Internal Control Level.

A study began in October 2023 and continued into the first quarter of 2024 to examine the method and effectiveness of using the standard whole body TLD to calculate eye lens dose. The study determined that the whole body TLD was effective. Overall, doses to the lens of the eye are well under the regulatory limit.

3.7.13 Total Estimated Doses to Members of the Public

Total effective radiation dose equivalent to members of the public are specified in the *Radiation Protection Regulations* and listed in Table 11. It is a calculated value, measured in mSv, which takes



into account the absorbed dose to all organs of the body, the relative harm level of the radiation, and the sensitivities of each organ to radiation. To ensure compliance with this regulation, BWXT NEC has established Derived Release Limits (DRLs) for uranium emissions to the environment. The facility DRLs account for the realistic exposure pathways as described in the facility Radiation Protection Program to restrict dose to a member of the public to 1 mSv (1,000 μ Sv) per year, which is the regulatory dose limit. The DRLs assume that a member of the public occupies the BWXT NEC facility perimeter continuously (24 hours per day, 365 days per year). Note: Liquid effluent is not included in the calculation of public dose as the effluent is discharged directly to city sewer systems and is not used for drinking. The estimated effective dose as a result of air releases is calculated through direct correlation with the facility DRLs.

In addition, the contribution from gamma radiation emission to the nearest member of the public is calculated from the net sum of the nearest environmental TLD results from all monitoring periods. The calculation assumes that a member of the public occupies the nearest residence for 66% of their time for the entire year.

Over the reporting period, the radiation dose to members of the public surrounding the BWXT NEC Peterborough facility was a small fraction of the applicable regulatory dose limit as shown in Table 20. As a result of the facility operations, the total estimated radiation dose to a member of the public is 0.0 μ Sv (0.0 μ Sv from air emissions + 0.0 μ Sv from direct gamma radiation). In comparison to the 1 mSv (1,000 μ Sv) per year effective dose limit to a member of the public, dose from the operations is very low at 0%.

Period	Estimated Annual Public Dose (µSv)	% of Public Dose Limit (1,000 µSv = 1 mSv)
2024	0	0%
2023	0	0%
2022	11.5	1%
2021	0.0	0%
2020	0.0	0%

Table 20: Estimated Radiation Doses to Members of the Public

3.8 Conventional Health and Safety

The "Conventional Health and Safety" Safety and Control Area covers the implementation of a program to manage non-radiological workplace safety hazards and to protect personnel and equipment.

BWXT NEC has a well-established integrated management system for Environment, Health and Safety (EHS) Program excellence. This is ensured through the effective implementation of program elements. BWXT NEC has an established *EHS Mission Statement* that is reviewed and signed annually by the President of BWXT NEC. BWXT NEC's objective is to eliminate or minimize as low as reasonably achievable both known and potential environmental, safety and health hazards which could impact our employees and the communities in which they live. EHS is a shared responsibility, top business priority and is continually improved.



Key components of the Environment, Health and Safety Program include:

- > Compliance with all safety and health-related regulatory requirements;
- > The setting of EHS goals and objectives;
- > Hazard recognition, risk assessment and change control processes;
- > A comprehensive worker training program; and,
- Documented safety concerns, near misses and incidents with appropriate root-cause analysis, and preventative and corrective actions.

The EHS Program includes all worker safety elements that demonstrate compliance with relevant regulations, codes and standards:

- EHS Policy
- > Hazard Analysis and Regulatory Compliance
- Employee Involvement
- EHS Specialist
- Accident/Incident Investigation
- EHS Training
- Housekeeping
- Personal Protective Equipment
- Contractor Safety
- Emergency Preparedness/Response
- Risk Assessments
- High Risk Operations
- Industrial Hygiene
- Chemical Management
- > Ergonomics
- Lock-Out Tag-Out

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, and near miss and incident investigations. The effectiveness of the overall program is reviewed throughout the year and evaluated in the annual management review (section 3.2.3).

3.8.1 Workplace Safety Committees

Eleven meetings were held with quorum, and a total of 77 investigations and inspections were conducted in the reporting period. This includes Workplace Safety Committee (WSC) inspections, manager inspections, and near miss, incident and injury investigations. These investigations and inspections led to a total of 79 actions logged and tracked to closure. The top finding categories were 'housekeeping', 'egress', 'emergency equipment/fire protection', and 'chemical management and spill protection'. Established WSC goals for the reporting period are summarized in Table 21.



WSC Goals	Actual	Result
Meet at least 9 times/year	11/12	Complete
Beryllium Committee Guest Attendance and Discussion	1/1	Complete
Inspection tour completion target of 24 out of a possible 36 (12 months x 3 areas)	27/36	Complete
Gap analysis with Toronto inspection checklist	1/1	Complete

Table 21: Workplace Safety Committee Goals and Results

2025 WSC goals are established as follows:

- 1. Meet at least nine times as required by the Canada Labour Code Part II.
- 2. Beryllium Committee guest attendance and discussion.
- 3. Inspection tour completion target of 24 out of a possible 36 (12 months' x 3 areas).
- 4. Review a section of the *Canada Occupational Health and Safety Regulations* (SOR/86-304) each month).
- 5. Confined Space Entry review photos and entry points.

3.8.2 Hazardous Occurrences

Under the *Canada Occupational Health and Safety Regulations* there are several different types of hazardous occurrences including:

- Minor Injury: any employment injury or an occupational disease for which medical treatment is provided and excludes a disabling injury.
- Disabling Injury: any employment injury or an occupational disease that results in either time loss, or modified duties. Disabling injuries can be either temporary, or permanent, depending on whether the employee is expected to make a full recovery.
- > Loss of Consciousness: from an electric shock or a toxic or oxygen deficient atmosphere.
- Rescue / Revival or other Emergency Procedures: any incident that requires emergency procedures to be implemented, such as a hazardous substance spill, bomb threat or violence prevention procedure.

Annual reports are provided to the Minister of Employment and Social Development Canada as required by regulation.

3.8.2.1 Injuries and Illness

BWXT NEC Peterborough had nine consecutive years without a Lost Time Injury (LTI) prior to 2021 (Refer to Table 22). During the reporting period, there were zero lost time injuries, zero minor injuries and ten first aids. The top injury categories were 'contact with sharp object/cut or abrasion' and 'struck against'. There were 37 near misses logged following defined event classification criteria. The top noted root causes were 'human error', 'inadequate job planning, instruction, supervision', and 'Inadequate Mechanical Integrity / Maintenance Management'.



2020	2021	2022	2023	2024
0	1	2	0	0

Table 22: Lost Time Injuries

3.9 Environmental Protection

The "Environmental Protection" Safety and Control Area covers programs that monitor and control all releases of nuclear and hazardous substances into the environment, as well as their effects on the environment as a result of licensed activities.

BWXT NEC has an effective environmental protection program in place which identifies and controls environmental aspects and drives continuous improvement to enhance performance and minimize risk to employees and the public. The facility has a well-established environmental management system to ensure effective monitoring programs are in place to achieve environmental goals and regulatory compliance. The environmental protection program is compliant with:

- CSA N288.6-12, Environmental risk assessments at Class I nuclear facilities and uranium mines and mills,
- CSA N288.5-11, Effluent monitoring programs at Class I nuclear facilities and uranium mines and mills, and
- CSA N288.4-10, Environmental monitoring programs at Class I nuclear facilities and uranium mines and mills.

3.9.1 Environmental Risk Assessment

An Environmental Risk Assessment (ERA) has been completed in accordance with CSA N288.6-22. The ERA concluded that emissions from the facility were very low and no adverse effects to human health are expected.

The emissions of non-radioactive contaminants from the facility were below the MECP Point of Impingement (POI) standards; and water releases are also assessed to be minimal. Hence, it was concluded that the emissions of non-radiological substances resulting from the facility poses no adverse effect to human health.

The ERA also concluded that emissions of radioactive and non-radioactive materials from the facility pose no adverse effects to non-human biota.

The ERA is available on BWXT NEC's public information website: <u>www.nec.bwxt.com</u>.

3.9.2 Environmental Management System

BWXT NEC has a well-established integrated management system for Environment, Health and Safety Program excellence. This is ensured through the effective implementation of program elements. BWXT NEC has an established *EHS Mission Statement* that is reviewed and signed annually by the President of BWXT NEC. BWXT NEC's objective is to eliminate or minimize as low as reasonably achievable both known and potential environmental hazards which could impact our employees and the communities in which they live. EHS is a shared responsibility, top business priority and is continually improved.

An Environmental Management System is in place to identify and control environmental aspects and drive continuous improvement to enhance performance and minimize risk to the employees and the public.

Key components of the environmental protection program include:



- Compliance with all environmental-related regulatory requirements;
- > The setting of environmental goals and objectives;
- > Hazard recognition, risk assessment and change control processes;
- > A comprehensive worker training program; and,
- Documented environmental concerns, near misses and incidents with appropriate rootcause analysis, preventative and corrective actions.

The EHS program includes all environmental protection elements that demonstrate compliance with relevant regulations, codes, and standards:

- ≻ Air
- Water
- > Waste
- Dangerous goods shipping
- Boundary radiation monitoring
- Soil sampling

Continuous improvement is achieved through several review processes, including site inspections, reported concerns, near miss and incident investigations, self-assessments, and audits. Environmental goals performance is discussed in section 3.9.4. Following these proactive reviews, the findings are documented, and corrective actions identified and tracked to completion.

Internal inspections are completed on a routine basis and include all areas of the facility. The purpose of these inspections is to identify environmental as well as health and safety issues. WSC members carry out routine site inspections. After an inspection, the findings are documented, corrective actions identified and submitted to responsible personnel to address. Depending on the complexity of the finding immediate action may be required (e.g., equipment shutdown), or the action may be incorporated into meeting minutes, or tracked in the ATS.

There were no updates made to the Environmental Management System in the reporting period.

3.9.3 Effluent and Environmental Monitoring Programs

Small amounts of radiological and non-radiological substances are released to the environment as the result of operations at BWXT NEC. Environmental protection is regulated municipally for water effluent through sewer-use by-laws, provincially for air effluent, and federally by the CNSC for both air and water. Airborne and waterborne radiological and non-radiological emissions to the environment are monitored as part of the effluent monitoring programs. BWXT NEC's effluent and environmental monitoring program is comprised of the following components:

- 1. Air effluent
- 2. Water effluent
- 3. Soil sampling

BWXT NEC has established CNSC accepted Action Levels for various environmental parameters. An Action Level is defined in the *Radiation Protection Regulations* as "a specific dose of radiation or other parameter that, if reached, may indicate a loss of control of part of a licensee's Radiation



Protection Program, and triggers a requirement for specific action to be taken." Action Levels are also applied to environmental protection. Action Levels are set below regulatory limits; however, they are CNSC reportable events. Accordingly, BWXT NEC has established Internal Control Levels for various environmental parameters that are set even lower than Action Levels to act as an early warning system. Internal Control Level exceedances trigger an internal investigation and corrective actions; however, they are not CNSC reportable events. During the reporting period, basic process objectives were established for liquid effluent. No Action Levels or regulatory limits were exceeded during the reporting period.

3.9.3.1 Independent Environmental Monitoring Program

To complement existing and ongoing compliance activities and site monitoring programs, the CNSC implemented its Independent Environmental Monitoring Program (IEMP) to verify that the public and environment around CNSC-regulated facilities are not adversely affected by releases to the environment. This verification is achieved through independent sampling and analysis by the CNSC. This program applies to the BWXT NEC operations. The most recent results are available for sampling conducted in 2021. The results are compared to relevant provincial and federal guidelines and are available on the CNSC website.

3.9.4 Environmental Protection Program Performance

Environmental protection goals and results are summarized in Table 23, and were partially achieved. The installation of hand dryers resulted in a paper towel reduction of 18% in office spaces, however the consumption in manufacturing areas increased in 2024, resulting in the goal not being achieved.

Environmental Protection Program Goals	Actual	Result
Reduce paper towel consumption by 10%.	Reduced usage by 2%	Not Achieved
Complete one asbestos abatement project by year end	Complete	Achieved

Table 23: Environmental Protection Program Goals

2025 Environmental Protection goals are established as follows:

- 1. Improve chemical storage and handling in the boiler room.
- 2. Complete one asbestos abatement project.

3.9.5 Air Effluent Monitoring

BWXT NEC Peterborough is currently in the transition from an Environmental Compliance Approval (ECA) to an EASR (Environmental Activity and Sector Registry) with the MECP for air emissions. The site maintains emission summary and dispersion modelling reports and acoustic assessment reports that demonstrate compliance with relevant legislation. An annual summary report is submitted to the MECP. Monitoring of airborne emissions is not required by the MECP as the emissions are deemed to be insignificant in accordance with MECP methodology. Due to the additional regulation by the CNSC, uranium and beryllium stack emissions are both monitored and compared to CNSC Action Levels.

A single process uranium air emission point exists. The R2 Area exhaust system exhausts through a High Efficiency Particulate Air (HEPA) filter. The facility performs continuous in-stack monitoring drawing a sample of air across a filter capable of trapping uranium dust. The filter papers are



analyzed in-house and verified externally by an independent laboratory by delayed neutron activation analysis. The minimum detection limit is 0.01 μ g uranium. Results are compared to the previous results and to the Internal Control Level and Action Level of 1.0 μ g/m³. Measured uranium air emissions are included in the estimated dose to members of the public through direct correlation with facility DRLs. Details are provided in section 3.7.13.

The facility also uses beryllium as part of the fuel bundle manufacturing process. The *Environmental Protection Act of Ontario* (R.S.O. 1990, c. E. 19) and *Ontario Regulation 419/05 Air Pollution – Local Air Quality* determine the permitted concentration of contaminant release. The limit at the POI for Beryllium is 0.01 μ g per cubic meter of air (μ g/m³). The POI is the plant/public boundary. Three beryllium air emission points exist. The facility performs continuous in-stack monitoring drawing a sample of air across a filter capable of trapping beryllium. The filter is analyzed for beryllium using the Atomic Absorption method or the Inductively Coupled Plasma – Atomic Emission Spectrometer method at an accredited external independent laboratory. The result is related to the air volume passed through the filter. The minimum detection limit is 0.002 µg beryllium. A calculation of the concentration is then made based on the volume of air drawn across the filter. These values are compared to the previous results, and to the Internal Control Level of 0.01 µg/m³ and Action Level of 0.03 µg/m³ at the stack exit, which are both very conservative.

A summary of air effluent sampling results is in Table 24. Uranium air releases continue to remain low and well below the Action Level of 1 μ g/m³ as presented in Figure 7. Refer to previous annual compliance reports for past uranium stack air emissions that were previously compared to a massbased release limit, as opposed to the concentration-based limit established in the current Licence. The five-year trend graph of annual beryllium air concentrations presented in Figure 8 shows a stable performance consisting of very low measurements.

Stack Description	Emission Contaminant	Total Number of Samples	Action Level (μg/m ³) (# Samples Exceeding Level)	Licence Release Limit (µg/m³) (# Samples Exceeding Limit)	Highest Value Recorded (µg/m ³)	Average Value Recorded (μg/m ³)
R2 Area	Uranium	51	1.0 (0)	410 (0)	0.005	0.001
North	Beryllium	51	0.03 (0)	2.6 (0)	0.000	0.000
Acid	Beryllium	51	0.03 (0)	2.6 (0)	0.001	0.000
South	Beryllium	51	0.03 (0)	2.6 (0)	0.000	0.000

Figure 7: 5-Year Uranium in Air Effluent

Note: The above graph has a logarithmic scale.

Figure 8: 5-Year Beryllium in Air Effluent

Note: The above graph has a logarithmic scale.

3.9.6 Water Effluent Monitoring

All potentially uranium-contaminated wastewater is held for determination of the quantity and concentration of uranium prior to discharge. Liquid waste generated from routine activities, such as washing floors, walls and equipment in the uranium pellet loading and end closure weld area is held in a 205-Litre (45-gallon) drum stored in the maintenance area. Most of the potentially contaminated wastewater originates from floor washing. The water is filtered and agitated prior to sampling, and then sent for independent analysis at an accredited external laboratory. The minimum detectable concentration is 0.000002 mg U/L (parts per million (ppm)). After the wastewater sample result is verified to be below the Internal Control Level of 3 ppm (per batch) and the Action Level of 3 ppm (annual average), the wash water is discharged to the sanitary sewer.

A summary of uranium in water effluent sampling results is presented in Table 25. Uranium water releases continue to remain low and below the Action Level of 0.003 g/L (3 ppm (annual average)), and the licenced release limit of 0.14 g/L (weekly composite), as presented in Figure 9. Refer to previous annual compliance reports for past uranium in water emissions that were previously compared to a mass-based release limit, as opposed to the concentration-based limit established in the current Licence.

Uranium	2020	2021	2022	2023	2024
Total Amount of Liquid Discharged (L) from Uranium Processing Areas	1025	410	820	615	615
Average Concentration (at the point of release) (ppm)	0.20	0.22	0.30	0.07	0.01
Maximum Concentration (at the point of release) (ppm)	0.37	0.41	0.78	0.20	0.01
Number of Samples Exceeding Internal Control Level (3 ppm)	0	0	0	0	0
Number of Samples Exceeding Action Level (3 ppm annual average)		0	0	0	0

A second liquid effluent is beryllium in water that is generated from equipment use and cleaning activities in the beryllium classified areas. BWXT NEC has established an Internal Control Level of 4 μ g/L and Action Level of 40 μ g/L. The Internal Control Level is conservatively consistent with international drinking water guidelines for beryllium, noting that the discharge point is to the sanitary sewer (i.e., not to drinking water). All potentially beryllium-contaminated water passes through a weir settling system prior to release to the sanitary sewer. Regular sampling of the beryllium wastewater is conducted. The water sample consists of a 24-hour composite sample taken from the outflow line. It is sent for analysis at an external accredited independent laboratory. The minimum detectable

Note: The above graph has a logarithmic scale.

concentration is 0.007 μ g Be/L (0.000007 mg Be/L or parts per million (ppm)). Sampling results are presented in Table 26.

Beryllium average and maximum concentrations are trending steady, as presented in Figure 10. Where Internal Control Levels are exceeded, internal investigation is conducted to determine the cause and corrective/preventative actions are tracked to closure.

Beryllium	2020	2021	2022	2023	2024
Total Number of Samples Analyzed for Beryllium Concentration in Water	20	17	18	20	16
Average Concentration (at the point of release) (μ g/L)	1.4	0.9	0.8	0.6	0.4
Maximum Concentration (at the point of release) (µg/L)	9.1	3.1	3.3	3.8	1.4
Number of Samples Exceeding Internal Control Level (4 µg/L)	1	0	0	0	0
Number of Samples Exceeding Action Level (40 µg/L)		0	0	0	0

Table 26: Beryllium in Water Effluent Sampling Summary

Note: The above graph has a logarithmic scale.

3.9.7 Soil Sampling Measurements/Monitoring

Facility air emissions are the primary pathway for potential release into the natural environment by impingement on the ground surface in the immediate vicinity of the facility depending on the wind direction. Uranium and beryllium may be washed into the soil by rainfall, snow, etc. Depositions of uranium or beryllium are detected by taking small samples of surface soil and analyzing. Soil sampling for beryllium and uranium started in 2021 and is conducted annually by a third-party consultant. If soil analysis indicates concentrations higher than the background levels and MECP standards or rising levels, emissions may have increased, and investigation can be made into the cause.

Samples of surface soil are retrieved from 13 locations in accordance with a documented plan. The sampling methodology used is based on the MECP *Guidelines on Sampling and Analytical Methods for Use at Contaminated Sites in Ontario*, December 1996, ISBN-0-7778-4056-1. Three quality control soil samples at a background location more than 19 km west of the facility are also taken, along with two replicate samples for field quality control purposes. The soil samples are stored in a cooler with ice and transported the next day for analysis at an independent accredited laboratory by Inductively Coupled Plasma Mass Spectrometry for uranium and beryllium content. The minimum detectable concentration of uranium is 1.0 part per million (1.0 μ g U/g). The minimum detectable concentration of beryllium is 0.5 part per million (0.5 μ g Be/g). Results are compared to previous years and the MECP guidelines.

The results of the soil sampling program were compared to the stringent standards in MECP Table 1 (Full Depth Background Site Condition Standards). For residential, parkland, institutional, industrial, commercial, and community property uses, the standard is 2.5 μ g/g for both uranium and beryllium.

Table 27: 2024 Soil Sampling Result Summary					
	Uranium	Beryllium			
MECP Guideline (µg/g)	2.5 µg U/g	2.5 µg Be/g			
Minimum Detectable Limit (µg/g)	1.0	0.5			
Number of Samples Taken	13	13			
Average concentration (µg/g)	<1.0	<0.50			
Maximum concentration (µg/g)	<1.0	0.50			

A summary of results taken in the reporting period is listed in Table 27.

The analytical results for uranium and beryllium concentrations for all soil samples analyzed are without exception well below the acceptable standard published by the MECP Table 1 Background Site Condition Standards. Based on the results of the sampling program there is no evidence that uranium or beryllium used at the BWXT NEC facility has had any impact on Peterborough soils. No risk has been identified to the soils or to the public of Peterborough.

3.10 Emergency Management and Fire Protection

The emergency preparedness and fire protection programs are well-established and effective. The facility has an established emergency plan that describes the actions to be taken to minimize the health and environmental hazards, which may result from fires, explosions, or the release of hazardous materials. The plan includes effects to the local area and members of the public. The

plans are intended to reduce the risk of fires within the facility and assist emergency staff and plant personnel in understanding key emergency response issues, and assist the facility in protecting employees, the local community, and the environment through sound emergency management practices. The emergency plan is developed in accordance with applicable standards and meets the CNSC operating Licence requirements.

Continuous improvement is achieved through several review processes, including site inspections, reported safety concerns, near miss and incident investigations, drills, and self-assessments. Non-conformances are tracked to closure.

There were no events that activated the emergency organization during the reporting period.

On July 22 an overfilled cigarette butt receptacle located in a designated, outdoor, smoking area, began smoldering. This was reported to EHS, where subsequently EHS and a trained member of the ERT responded to the area and extinguished the smoldering cigarette butt receptacle. Peterborough fire was not required to respond to this event. Three preventative actions were entered into the ATS system to be tracked to closure.

3.10.1 Emergency Preparedness Program Activities

The facility continues to update and improve its Emergency Response Program. Program improvements including revisions to emergency response work instructions were made during the reporting period.

Emergency preparedness training is achieved through response drills where responses are critiqued to continually improve the effectiveness of the process. These are conducted at least annually. All employees are trained on established fire prevention measures, emergency situation responses, emergency evacuation routes and their responsibilities. Awareness training is conducted during new employee orientation and refreshed through response drills. On-site emergency responders are provided with the level of training necessary to allow them to effectively perform their designated functions as defined the training matrix. Training course completion is summarized in Table 4. Tests of the emergency response plans were performed in the following areas:

- 1. Fire safety/evacuation (two),
- 2. Full scale emergency exercise with Peterborough Fire Services and activation of the Emergency Management Organization (EMO) (one),
- 3. Remote activation of the Emergency Management Organization (EMO) (one),
- 4. Doffing of B3 contaminated individual (one).

Peterborough Fire Services participated in one of these drills and BWXT NEC's Emergency Organization was activated.

3.10.2 Fire Protection Program Activities

The Fire Protection Program describes the systems and resources available to prevent and detect fire and to minimize impact from a fire event and consists of the following key elements:

- Fire and Life Safety Features,
- Inspection and Maintenance,
- Fire Protection Assessment,
- Fire Protection,

- Housekeeping,
- Minimization of Combustibles,
- Ignition Source Control,
- Impairment,
- > Design for the Prevention and Mitigation of Fires,
- ➤ Training,
- Outside Coordination, and
- Program Assessment.

The documented Fire Hazards Analysis (FHA) identifies the facility fire hazards and their potential impact on worker and public safety, and asset protection. FHAs are available for Building 21, Building 24, and Buildings 26/28. In March of 2024 an on-site inspection for the FHA was completed, and the updated document expected to be issued in 2025.

The facility maintains a documented fire safety plan that is developed in accordance with the National Fire Code of Canada, the *National Building Code of Canada* and CSA N393-13, *Fire protection for facilities that process, handle, or store nuclear substances.* The fire safety plan is based on the documented FHA and ensures that measures are appropriate to the facility. The fire safety plan provides information on resources in the buildings, emergency procedures and actions to be taken in the event of a fire. It includes training, duties of designated personnel, details of maintenance procedures and fire protection measures. The information assists the occupants in utilizing life safety features in the buildings, ensures an orderly evacuation at the time of an emergency and provides a maximum degree of flexibility to achieve the necessary fire safety for the buildings. The fire safety plan was approved by Peterborough Fire Services on December 18, 2024.

Fire protection systems are inspected and tested in accordance with the *National Fire Code of Canada* following an established schedule. A third-party review and an internal self-assessment are conducted annually. Identified continuous improvements are tracked to completion using the ATS.

The program facilitates effective communication and exchange of relevant information, and assures timely, reliable, and effective decision making and response actions. Site hazard reviews and site familiarization tours are offered annually with Peterborough Fire Services. These tours did not occur in 2024 as Peterborough Fire Services had priorities on technical rescue, hazmat, mental health etc. The familiarization tours with Peterborough Fire Services will be offered again in 2025.

3.11 Waste Management

The "Waste Management" Safety and Control Area covers internal waste and by-product related programs which form part of the facility's operations, up to the point where the waste is removed from the facility to a separate waste and by-product management facility. This Safety and Control Area also covers the ongoing decontamination and planning for decommissioning activities.

Radioactive wastes are any materials that contain a nuclear substance, and which have been declared to be waste. BWXT NEC has an effective and well-established radioactive waste disposal program that ensures all radioactive waste disposals are compliant with the *Nuclear Safety and Control Act* and associated regulations and the facility operating Licence Conditions. Radioactive solid wastes generated from fuel manufacturing, which consist of, or are contaminated by uranium are accumulated in controlled and classified areas. A low volume of radioactive wastes from Peterborough are transported to and consolidated with the Toronto facility wastes. These are

combined, compacted for volume reduction where possible, and shipped routinely to a licensed radioactive waste disposal facility.

Waste management and generation details are further described in Appendix B, submitted to the CNSC separately.

BWXT NEC maintains a Preliminary Decommissioning Plan (PDP) and Financial Guarantees in accordance with CNSC Regulatory Guide G-219 *Decommissioning Planning for Licensed Activities*, CNSC Regulatory Guide G-206 *Financial Guarantees for the Decommissioning of Licensed Activities*, and CSA N294-09 *Decommissioning of Facilities Containing Nuclear Substances*. The PDP strategy and end-state objective of decommissioning is to release the site from regulatory control for industrial use or demolition of the structures. These are reviewed at least once every five years. The PDP summaries for Peterborough and Toronto remain available on our website (www.nec.bwxt.com).

In November of 2022, BWXT NEC submitted an updated PDP to CNSC staff, which was revised in August of 2023 and was accepted by CNSC staff in October of 2023. In 2024, the CNSC Commission accepted the revised financial guarantee amount and BWXT put in place the required financial guarantee instruments to reflect these accepted amounts.

The facility conducts an annual Waste Audit and Waste Reduction Work Plan due to the large office space, in accordance with *Ontario Regulation* 102/94 under the *Environmental Protection Act*. The audit serves to assess and advance the non-nuclear waste diversion initiatives and consists of the physical collection and sorting of generated waste and includes a waste composition study. It provides a prepared Waste Reduction Work Plan where areas of success are highlighted and opportunities for improvement are identified through waste reduction, reuse, and recycling. The results of the audit are communicated to employees and waste reduction and diversion initiatives are undertaken.

3.12 Security

The "Security" Safety and Control Area covers the programs required to implement and support the security requirements stipulated in the regulations and in the Licence.

The facility maintains a Security Program in accordance with the *General Nuclear Safety and Control Regulations*, *Class I Nuclear Facilities Regulations*, and the *Nuclear Security Regulations*. The Security Program outlines the systems, processes and responsibilities for performing security operations with the objective of maintaining a safe and secure facility. The program manual identifies the individual responsibilities for implementation and maintenance of the program. The manual includes instructions for administering the Security Program, provides the basis for security protocols and identifies the controls in place to meet regulatory requirements. Program details are prescribed information and confidential. Examples of security measures in place include:

- Access control (access cards and locked restricted-access areas);
- Facility Access Security Clearance Program;
- Security guards;
- Security barriers;
- Intrusion detection systems; and,
- > Preventing the unauthorized removal of nuclear material.

3.13 Safeguards and Non-Proliferation

The "Safeguards and Non-proliferation" Safety and Control Area covers the programs required for the successful implementation of the obligations arising from the Canada/IAEA Safeguards and Non-proliferation Agreement. BWXT NEC has implemented and maintains a Safeguards Program and undertakes all required measures to ensure safeguards implementation in accordance with IAEA commitments and CNSC regulatory document 2.13.1 *Safeguards and Nuclear Material Accountancy*. Movement of safeguarded nuclear material (inventory changes) are documented and reported to the CNSC as required.

BWXT NEC has implemented and maintains a well-established Safeguards Program and undertakes all required measures to ensure IAEA commitments and CNSC regulatory requirements are met. BWXT NEC reports all Inventory Change Documents through the Nuclear Materials Accountancy Reporting system.

The Physical Inventory Taking (PIT), was conducted in July and was followed by a Physical Inventory Verification (PIV) and Design Information Verification (DIV) on July 18th and 19th which involved both the CNSC and the IAEA. The scope of the PIV concerned book examination, physical verification of nuclear material and evaluation of the quality and performance of BWXT NEC's measurement system. The scope of the DIV concerned verification of the facility, general building design, essential equipment, accounting procedures, operator's measurement system, nuclear material location and flow and operational status of the facility. No non-conformances were noted.

Two short notice random inspections took place during the reporting period on February 13 and on September 25. The inspection involved physical examination of bundle boxes, sampling and scanning of pellet skids and verification of records. No non-conformances were noted during the February inspection. During the September inspection a seal was broken when a skid of fuel was repositioned. This incident was reported to the CNSC duty officer by BWXT. There were no impacts on health, safety, the environment, or the community resulting from this incident.

3.14 Packaging and Transport of Nuclear Substances

The "Packaging and Transport of Nuclear Substances" Safety and Control Area covers the packaging and transport of nuclear substances and other nuclear materials to and from the licensed facility.

During the reporting period, there were two CNSC reportable events that occurred, the first occurred in March of 2024, a single pellet was mistakenly shipped back to the Toronto facility in what was thought to be an empty skid. An investigation was conducted internally, and corrective actions assigned and tracked to closure. There were no impacts on health, safety, the environment, or the community resulting from this incident. The second event was an undeliverable consignment to the Darlington Nuclear Facility, requiring the shipment to be returned to our facility for secure storage until it could be safely delivered. All other shipments were conducted safely according to regulations during the reporting period.

Shipments of dangerous goods are not routinely made from BWXT NEC by air, rail, or water. Routine road shipments of both dangerous goods and non-dangerous goods are made between suppliers, the Toronto plant, the Peterborough plant, and customer nuclear generating stations. Shipments of prescribed substances are only made to:

Persons in Canada, holding a valid CNSC Licence to possess such prescribed substances; or

- Persons in Canada, not requiring a valid CNSC Licence by virtue of the Nuclear Safety and Control Act and regulations; or
- Persons outside Canada, as approved by an Export Permit and CNSC Export Licence, or combination of CNSC Export Licence and reference to General Export Permit as applicable.

The transportation of dangerous goods in Canada is regulated by Transport Canada through the *Transportation of Dangerous Goods Regulations*. Additional requirements for the transport of Class 7 radioactive materials is regulated by the CNSC through the *Packaging and Transportation of Nuclear Substances Regulations*. In addition, the IAEA has established uniform regulations for all modes of transportation throughout the world. The IAEA has published the *Regulations for the Safe Transport of Radioactive Material* and the CNSC has endorsed these through the *Packaging and Transport of Nuclear Substances Regulations*.

BWXT NEC has an established *Emergency Response Assistance Plan* compliant to Part 7 of the *Transportation of Dangerous Goods Regulations*. It is in place to ensure that timely and effective response protocols are in place with the intent to protect public safety, property, and the environment in the event of an accident involving the transportation of natural or depleted UO₂.

4 OTHER MATTERS OF REGULATORY INTEREST

4.1 Public Information & Disclosure Program

At BWXT NEC, we are committed to connecting with the Peterborough community in a timely, transparent and meaningful way. We recognize that the most effective way to build and sustain public trust is to maintain environmental excellence while fostering an atmosphere of openness and transparency with the community. The purpose of our Public Information & Disclosure Program is to provide the strategy and methodologies to be employed for public communications, information distribution and feedback, and how these activities will be managed. The objectives of our program are to:

- Improve the level of awareness and understanding among community members about our licensed operations and activities.
- Provide information on the anticipated effects to the environment and on human health and safety, of the licensed activity to the community.
- Foster dialogue with the community to assist our team in determining the information needs and preferred methods for information sharing.
- Build and maintain a relationship of trust with the community.
- Provide meaningful opportunities for the community to discuss and share issues and relay concerns related to our facilities.
- Provide opportunities for community members and other interested parties to visit and tour our facilities.

Over the course of 2024, improvements were made to our Public Information & Disclosure Program. In September, a Communications Specialist was hired to support the program. More in-person meetings, tours and events were held to allow for increased two-way dialogue and feedback. Our relationship with Curve Lake First Nation continued to strengthen and we are working towards implementing actions from our Indigenous Relations Roadmap in 2025. We saw an increase in positive news and media in 2024 and utilized advanced social media tools to share information and connect with community members. We began to improve our engagement with Prince of Wales Public School and continue to find ways to

engage and support the community. Attendance at CLC meetings improved and feedback was collected throughout the year.

An annual review of the program was conducted in August and a revision to the program document was submitted to CNSC. Additionally, a CNSC inspection was held in November on the Public Information & Disclosure Program. Results from this inspection were provided to BWXT in February. One notice of non-compliance was raised actioning BWXT NEC to add a contact to the Public Disclosure webpage and a PDF of the protocol. The PDF of the protocol has existed on the webpage since 2020, and the primary contact for the program will be added to close out this action.

We look forward to continuing to find ways to improve our program, providing more in-person engagement opportunities, and implementing feedback from community members.

4.1.1 Employee/Internal Communications

BWXT NEC uses a variety of means to engage its ~400 employees in Peterborough. The company uses the employee portal (intranet), electronic bulletin boards, email alerts and printed communications to issue company news, executive blogs, and general business updates. Open communication is important to BWXT's leadership team, and employees are encouraged to contact leadership throughout the year with questions.

4.1.2 Government Stakeholders

BWXT NEC works to ensure there is open communication and awareness of operating activities with all levels of government in the Peterborough community:

- In March, Mayor Leal provided opening remarks at our announcement with Innovation Cluster on our strategic collaboration for innovation and economic growth.
- In May, representatives from BWXT NEC attended "Peterborough Day at Queen's Park" to showcase our operations in the Peterborough community with representatives from other locations. At this event, our team was able to meet with local and provincial government and share the importance of the work that occurs at our facility.
- In August, Warden Clark and representatives from Peterborough County visited for a meeting and tour. In September, MP Ferreri visited for a meeting and tour. During both visits there were no concerns raised about our safety and operations. Offers to meet were also extended to MPP Smith and Mayor Leal and Peterborough Council and we are working on coordinating these visits in 2025.

Figure 11: Fuel Shop Tour

Throughout the year, BWXT NEC emailed fourteen electronic updates to the MP for Peterborough-Kawartha, MPP for Peterborough, the Mayor, and Peterborough Councillors. More information about the details of these email updates can be found in 4.1.9.

4.1.3 Indigenous Relations

BWXT in Canada (which includes BWXT NEC) joined the Canadian Council for Indigenous Business (CCIB) in 2017 and is committed to building and sustaining positive relationships with Indigenous communities. BWXT is participating in the CCIB's Partnership Accreditation in Indigenous Relations (PAIR) certification program and is currently PAIR-Committed. BWXT Canada has an Indigenous Relations Committee that meets regularly to review objectives outlined in the PAIR criteria as the company works to find ways to increase Indigenous cultural awareness and strengthen its ties with Indigenous communities. In July of 2024, BWXT introduced an Indigenous Relations Roadmap for the company's operations in Canada. The Indigenous Relations Roadmap is a leadership guide to advancing Indigenous Truth and Reconciliation across the business efforts in an aligned and meaningful way. In September 2024 we established BWXT's Indigenous Relations Roadmap Oversight Committee to oversee the implementation of the Indigenous Relations Roadmap. The committee met three times since its establishment, resulting in the development of a committee charter and a list of actions that supports roadmap objectives and further aligns with business objectives and available resources. More information about BWXT's Roadmap can be found at www.nec.bwxt.com.

Throughout 2024, BWXT NEC met with members of Curve Lake First Nation's Consultation Department eleven times to exchange company and community updates. Topics of interest discussed at these meetings included environmental monitoring, community support, future events, operations in Peterborough and Toronto, and more.

- In March, representatives from BWXT NEC met with Curve Lake First Nation's Economic Development Committee to provide information about a potential business opportunity.
- In August, BWXT NEC held its annual soil sampling campaign and two representatives from Curve Lake First Nation's Consultation Department attended along with three of their summer students. After the sampling occurred, the group was provided a tour of the Peterborough facility. Representatives from Curve Lake First Nation's Consultation Department attended BWXT NEC's Community Information Event in October.
- In November, ten representatives from BWXT NEC visited Curve Lake First Nation for a community-led overview and tour, focused on culture and economic development. The visit began with a smudging ceremony at the Curve Lake First Nation Cultural Centre, followed by a welcome meeting with Chief Keith Knott and representatives from Curve Lake First Nation's Consultation, Culture and Economic Development departments. The group watched a documentary about the history of the Michi Saagiig (Mississauga) of Curve Lake First Nation. The day involved a tour of the new aquaponics facility, visit to Waawaashkeshi Waaginogaan (Deer Dome), lunch at the Government Services Building with Chief Knott and members of council, and a bus trip around the community. This community cultural visit was an important step in continuing to learn more about, and build upon, our relationship with Curve Lake First Nation.
- In November, representatives from BWXT NEC attended Curve Lake First Nation's Alternate Routes Career Fair where information about the operations and careers was shared with community members.

In 2024, BWXT NEC sponsored Curve Lake First Nation's Annual Pow Wow, provided funding to support Curve Lake First Nation's archaeological program, sponsored the Métis Nation of Ontario's Annual General Assembly and provided funding to the Métis Nation of Ontario Peterborough & District Wapiti Métis Council.

Figure 12: Cultural visit to Curve Lake First Nation

BWXT NEC looks forward to continuing to engage with and support Indigenous communities in Peterborough. Offers to meet and tour the facility will be prioritized in early 2025.

4.1.4 Community Relations

BWXT NEC is committed to timely and transparent communication with the Peterborough community and works to ensure there is open, two-way communication and awareness of BWXT NEC's operating activities. Throughout 2024, BWXT NEC utilized a variety of communication channels to provide information to neighbours, including electronic email updates (which includes any interested member of the public), fence banners, newsletters, mailers, social media and targeted advertising on Facebook. Community members can sign up to join BWXT NEC's email updates anytime by contacting the company at <u>questions@bwxt.com</u> or by submitting their info by clicking to our online form at <u>www.bwxt.com/bwxt-nec/contact-us-1</u>.

- In July, the Vice Principal from Prince of Wales Public School visited for a meeting and tour. During this visit, opportunities for collaboration were discussed.
- In September, representatives from BWXT NEC visited Prince of Wales Public School for a tour and meeting to continue the discussion.
- In September, BWXT NEC held a collection to help restock Prince of Wales Public School's breakfast program. Five boxes of donations were collected along with a monetary donation from employees.
- In October, BWXT NEC manufactured seven new garden boxes for the school. These
 garden boxes are used to educate students about environmental sustainability. Sixteen
 BWXT NEC employees spent the afternoon removing the old garden boxes and installing
 the new ones.
- In December, BWXT NEC representatives attended Prince of Wales Public School's Council meeting and provided an overview presentation and answered questions. BWXT NEC is in the process of coordinating a meeting and tour for interested members of School Council and parents from the community.

In August, BWXT NEC held its annual soil sampling campaign. Community Liaison Committee members, representatives from Curve Lake First Nation, and neighbours were invited to participate as observers. Two representatives from Curve Lake First Nation's consultation department attended along with three of their summer students.

Figure 13: Annual Soil Sampling Campaign

4.1.5 Community Volunteerism and Investment

In 2024, BWXT NEC's employees remained committed to supporting their community through volunteerism and charitable giving.

- In April, employees raised over \$600 for the Youth Emergency Shelter, participated as judges at the Peterborough Regional Science Fair, and assisted Ontario Federation of Anglers and Hunters at their Under the Lock Fishing Derby by helping local students learn to fish.
- In June, employees participated in Peterborough's Dragon Boat Festival, an event that employees from BWXT NEC's Peterborough site have participated in since 2002. BWXT NEC's team, the BWXT Xtreme Paddlers raised more than \$5,500 for the cause.
- In August, employees volunteered at the Youth Emergency Shelter to paint their three-floor staircase and hallways.
- In September, employees held a collection to help restock Prince of Wales Public School's breakfast program. Five boxes of donations were collected along with a monetary donation from employees.
- In October, employees built seven new garden boxes for the school. These garden boxes are used to educate students about environmental sustainability. Sixteen employees spent the afternoon removing the old garden boxes and installing the new ones.
- In December employees donated blood at Canadian Blood Services as part of their December Days of Giving campaign. Additionally, employees coordinated an Angel Tree collection and bake sale in support of Kinark Child and Family Services. Through this program, 70 children and five seniors were provided holiday gifts. Lastly, employees continued to provide funding to the Peterborough Regional Health Centre (PRHC) through a company charitable parking program.

BWXT NEC also made a number of charitable contributions to local organizations in 2024: provided three bursary awards for students in the School of Trades and Technology at Fleming College, three bursary awards to Trent University in the Computer Science program, and three bursary awards to Ontario Tech University; sponsored Peterborough's Dragon Boat Festival; sponsored the Peterborough Regional Science Fair and provided funding for awards; supported Kenner Collegiate Vocational Institute through student awards in STEM; sponsored a fish at the Ontario Federation of Anglers and Hunters Fishing Derby; sponsored the Métis Nation of Ontario's Annual General Assembly; provided funding to the Métis Nation of Ontario Peterborough & District Wapiti Métis Council; sponsored the Five Counties Summer BBQ; provided funding to Kinark Child and Family Services for holiday gifts for children in need; sponsored Curve Lake First Nation's Annual Pow Wow; and provided funding to support Curve Lake First Nation's archaeological training program.

Figure 14: BWXT volunteers at Prince of Wales Public School

4.1.6 Tours

BWXT NEC provides facility tours to help engage members of community in an effort to help them better understand our business and provide opportunities for in-person discussion and feedback. In 2024, five facility tours were provided: Community Liaison Committee (March); Vice Principal from Prince of Wales Public School (July); Warden Clark and representatives from Peterborough County (August); Curve Lake First Nation consultation and summer students (August); and MP Ferreri (October).

To additionally allow community members to see our operations, a virtual tour of the fuel bundle manufacturing is available to the public at <u>www.nec.bwxt.com</u>.

4.1.7 Community Events

In October, a Community Information Event was held in the evening at the McDonnel Street Community Centre. This in-person event provided an opportunity to engage with community members, obtain feedback, and educate about our operations. Approximately 18 community members attended the event. Information signs about safety, regulatory compliance, public information, fuel bundle manufacturing, fuel handling and engineering, careers, and radiation and uranium were displayed in the room, along with printed materials that community members could take home. BWXT NEC's virtual fuel bundle assembly tour was playing on a screen, and a video from the Canadian Nuclear Safety Commission's website about radiation was playing on another screen. Senior level management and directors were available to answer questions from community members and guests were encouraged to sign up to join BWXT NEC's email contact list. Additionally, guests could request to be included in the next community tour opportunity. Community members asked questions on the following topics: climate change, air monitoring, radiation detection and protection, community support and communication, and job opportunities.

Figure 15: BWXT Community Information Event

BWXT NEC issued invitations to the Community Information Event through a multipronged approach. Mailers were sent to over 5,000 neighbours, targeted social media advertisements were used and obtained over 7,700 views, details about the event were shared on the home page of <u>www.nec.bwxt.com</u>, and the invitation was included in two email updates to BWXT NEC's subscribers.

4.1.8 Community Newsletters, Email Updates, Postcard Mailers, and Brochures

Community Newsletters: BWXT NEC distributes community newsletters as a tool to share information with the local Peterborough community about the company's operational performance, health and safety, CNSC Licence, activities in the community and general information. Two newsletters were shared with the Peterborough community in May and November.

The Spring Newsletter provided an update on BWXT NEC's collaboration with Innovation Cluster, information on the 2023 Annual Compliance Report, and details about recent community involvement. The newsletter also contained an overview about the operations and contact information. The Spring Newsletter was mailed to over 5,000 community members and posted on www.nec.bwxt.com.

The Fall Newsletter shared details about BWXT NEC's support to Prince of Wales Public School, a link to read BWXT's Indigenous Relations Roadmap, information about the soil sampling results, an invitation to join the Community Liaison Committee, and information about the CNSC's annual public meeting. The newsletter also contained an overview about the operations and contact information.

Due to the Canada Post strike, the Fall Newsletter was not mailed. To ensure community members were provided the newsletter, BWXT NEC placed a targeted social media advertisement which obtained over 10,000 views. The Fall Newsletter was additionally included in an email updates to BWXT NEC's subscribers and posted on <u>www.nec.bwxt.com</u>.

Email Updates: BWXT NEC sends regular email updates to subscribers as another tool to share information and engage with the community. Community members can sign up to join BWXT NEC's email updates anytime by contacting the company at <u>questions@bwxt.com</u> or by submitting their info by clicking to our online form at <u>www.bwxt.com/bwxt-nec/contact-us-1</u>.

In 2024, fourteen email updates were sent. The following topics were covered: Annual Compliance Reporting, facts about uranium, commitment to environment, health and safety, corporate giving program, National Engineering Month, Innovation Cluster collaboration, BWXT Cambridge expansion announcement, Public Disclosure Protocol, social media links, volunteerism, involvement and charitable giving, Peterborough Day at Queen's Park, recognition of days of remembrance and importance, radiation facts, Indigenous relations updates, Indigenous Relations Roadmap, soil sampling campaign, CNSC annual public meeting, sharing information about tours that occur, community event invitations, Community Liaison Committee recruitment, community survey details and links, newsletter information, and a holiday message.

The email updates all include an introductory message from one of the members from BWXT's Corporate Affairs team who are responsible for the Public Information & Disclosure Program. Additionally, each email update contains contact information and details about BWXT NEC.

Postcard Mailers: BWXT NEC primarily uses mailed postcards as an additional outreach method to invite community members to participate in an event or share information on a specific topic. In 2024, two postcard mailers were sent.

The first postcard was mailed in September to over 5,000 community members to advertise for BWXT NEC's Community Information Event. The second postcard was mailed in October to over 5,000 community members to advertise BWXT NEC's community survey. A third postcard mailer was prepared and ready to be distributed to advertise for BWXT NEC's Community Liaison Committee, however due to the Canada Post strike, this postcard mailer was held at the facility and not sent.

Information Brochures: BWXT NEC maintains public information brochures. These brochures are updated annually when new information is available from the Annual Compliance Report. These brochures are available in during events and are also posted on <u>www.nec.bwxt.com</u>. Brochures are also available at the guardhouse along Monaghan Road.

4.1.9 Peterborough Community Liaison Committee (CLC)

The Peterborough CLC was established in 2020 and meets three to four times per year in the evening. The CLC is a forum for the exchange of information between the community and BWXT NEC and allows members to bring forward questions, discuss concerns and identify opportunities to improve community relations.

In 2024, the CLC had a membership of five members (including a representative from Peterborough Public Health, MovingMedia Canada, and Big Brothers Big Sisters of Peterborough). At least one director and multiple managers from BWXT NEC attended each regular CLC meeting.

BWXT NEC held a new member orientation on February 21 (virtual) and subsequently met with the CLC on March 20 (in-person) which included a tour, June 11 (virtual), and September 18 (in person) for regular meetings. A year-end evaluation meeting was held on November 28 (virtual). Meeting records are posted on <u>www.nec.bwxt.com</u>. A representative from the Canadian Nuclear Association

attended the June meeting to provide an overview on small modular reactors. Representatives from the CNSC attended the September 18 meeting virtually as observers. A hybrid approach to meetings was taken in 2024 to address feedback from 2023 members about availability in person. This change was encouraging as almost all members attended the CLC meetings in 2024.

Topics discussed during the 2024 meetings included: Preliminary Decommissioning Plans, annual compliance reporting and data review, soil sampling campaign, regulatory oversight, Indigenous relations and engagement, community support through charitable giving and volunteering, community events and tours, CLC recruitment, small modular reactors, radiation and public dose, and expanding participation at other events.

BWXT NEC launched a recruitment campaign in the fall of 2024 that aimed to attract new members to the CLC. Eleven applications were received, and all were accepted. One applicant has not since responded since their application; however, the remaining ten applicants will be joining the committee in 2025.

4.1.10 Website

BWXT NEC has a dedicated public information website, located at <u>www.nec.bwxt.com</u>. The website provides information about the company's operations and activities that can be accessed by members of the public and other key stakeholders.

In 2024, there were 21,816 sessions from 17,526 users. Top pages visited were: Home page (29%), About Peterborough (19%), About NEC (4%) and Contact (3%).

Over the course of 2024, new information was regularly updated on the website. The following represents some of the updates that were posted:

- Document summaries and environmental information
- Emergency response information and drill details
- Frequently asked questions
- Community Liaison Committee meeting minutes, recruitment information
- Community newsletters
- Community event details
- Annual Compliance Report information
- Notice of CNSC's annual public meeting
- Community involvement and support
- Community surveying

4.1.11 Community Survey

BWXT NEC conducts community surveys to obtain feedback from community members, including strengths and key areas for improvement. BWXT NEC's first survey was conducted in 2018 by Ipsos, an independent research firm. This survey provided BWXT NEC with baseline community feedback shortly after the acquisition of the company in December of 2016. Surveys are conducted every two years and copies are available at <u>nec.bwxt.com</u>.

BWXT NEC's 2024 survey was open to the community between October 28 – November 18 and participants could complete the survey online. BWXT NEC issued invitations to complete the survey through a multipronged approach. Mailers were sent to over 5,000 neighbours, targeted social media advertisements were used and obtained over 8,200 views, details about the survey was shared on the home page of <u>www.nec.bwxt.com</u>, and the invitation to complete the survey was included in two

email updates to BWXT NEC's subscribers. Results from the 2024 survey will be shared on the homepage of <u>nec.bwxt.com</u> once available.

4.1.12 Public Inquiries

Members of the public can contact BWXT NEC by calling our toll-free phone number, 1.855.696.9588 and/or emailing us at <u>questions@bwxt.com</u>. Additionally, community members can submit an online contact form <u>www.bwxt.com/bwxt-nec/contact-us-1</u> on our website. These contact details appear on BWXT NEC's website and on all information products.

In 2024, 1,573 emails were received by <u>questions@bwxt.com</u>, the majority of which were spam, questions for finance or purchasing, job seekers or agencies seeking employment verifications. Four emails were received from community members and were responded to within two business days. The questions received by these four community members were on the following topics: request for donation of recycled batteries for a school, two requests to tour the facility, and a request to be added to the email list and questions about community survey advertising. In 2024, there were 251 calls to the 1.855.696.9588 toll free number, most of which were related to employment verification, procurement, community giving or public/media relations. One call was received from a community member who has questions about whether they were required to RSVP to the community event. We encourage community members to use these channels to contact our team with questions, comments, and concerns. All emails and calls to the information line were appropriately handled and addressed.

4.1.13 Earned Media

In 2024, there were nine mentions of BWXT NEC in Peterborough news media, and the majority of the mentions were positive. Three articles focused on the Innovation Cluster collaboration announcement, two focused on Prince of Wales Public School's garden box initiative, one was on Shifting Gears and BWXT NEC receiving a workplace award, one was about the CNSC's confirmation that beryllium emissions do not pose a risk, one was about the CNSC's Independent Environmental Monitoring Program, and one was about the CNSC's uranium workers study timing.

4.1.14 Social Media

In 2020, BWXT NEC launched dedicated Facebook and X social media channels to better engage with community members. Social media channels help BWXT NEC share information about activities with the public in a timely way. In 2024, BWXT's corporate division consolidated BWXT NEC's Facebook and X accounts to be inclusive of all BWXT's operations in Canada and provide communities with a greater understanding of the business. To pivot with this change, BWXT NEC began utilizing targeted social media advertising to share information with the community around the facility. A total of six targeted Facebook advertisements were used and majority of the advertisements had comments and feedback which were dispositioned by BWXT NEC.

- Soil Sampling Campaign invitation garnered 6,338 views and 132 link clicks;
- Community Information Event invitation garnered 7,792 views and 216 link clicks;
- Emergency Drill advanced notice garnered 5,421 views and 172 link clicks;
- Community Survey invitation garnered 8,238 views and 342 link clicks;
- CLC Recruitment invitation garnered 5,479 views and 91 link clicks; and
- Fall Community Newsletter garnered 10,451 views and 282 link clicks.

To continue to expand opportunities to connect with the community, BWXT NEC plans to launch a dedicated Facebook Group in 2025 for the Peterborough and Toronto community. The purpose of this

group will be to share news with community members and provide an additional channel for two-way communication and feedback.

4.1.15 Public Disclosure Protocol

BWXT NEC has a Public Disclosure Protocol in place that sets guidelines for providing timely information to interested members of the public and other stakeholders. This protocol and any public disclosures issued by BWXT NEC can be found at <u>www.nec.bwxt.com</u>.

The Public Disclosure Protocol is readily available for download as a PDF on our website.

In 2024, there were no public disclosures.

4.2 Cost Recovery

BWXT NEC is current on its cost recovery payments to the CNSC.

4.3 Financial Guarantees

The Preliminary Decommissioning Plan and associated decommissioning cost estimates are in place in accordance with CNSC Regulatory Guide G-206 *Financial Guarantees for the Decommissioning of Licensed Activities*, CNSC Regulatory Guide G-219 *Decommissioning Planning for Licensed Activities*, and CSA N294-09 *Decommissioning of Facilities Containing Nuclear Substances*. The PDP strategy and end-state objective of decommissioning is to release the site from regulatory control for industrial use or demolition of the structures.

In November of 2022, BWXT NEC submitted an updated PDP to CNSC staff, which was revised in August of 2023 and was accepted by CNSC staff in October of 2023. In 2024, the CNSC Commission accepted the revised financial guarantee amount and BWXT put in place the required financial guarantee instruments to reflect these accepted amounts. The financial instruments remain valid in the format approved by the CNSC. The issuers of the financial guarantee instruments remain in good standing. The financial rating of the financial guarantee issuers were provided to the CNSC in March of 2025.

4.4 Improvement Plans and Future Outlook

BWXT NEC remains committed to continuously improve its EHS programs to improve efficiency and minimize risk to employees, the public and the environment. Facility operations are projected to increase in 2025. Fuel production levels are projected to be lower in 2026.

5 CONCLUDING REMARKS

BWXT NEC is committed to the establishment and continuous improvement of a healthy safety culture. Safety culture refers to the core values and behaviours resulting from a collective commitment by our company's leaders and individuals to emphasize safety, quality, ethics, and security over competing goals to ensure protection of employees, the public and the environment. It is a top business priority to continuously improve our EHS systems to protect fellow employees, the environment, and our communities against environmental, health and safety hazards. BWXT NEC management recognizes, reviews, prioritizes, and controls workplace hazards and ensures compliance with applicable regulatory requirements, applicable codes and company policies.

Governed by an integrated management system, conventional health and safety, radiation protection and environmental protection programs are well implemented. All radiation dose measurement

results were below Internal Control Levels, Action Levels, and regulatory limits. Environmental protection programs are well implemented. Facility emission results were very low and below Internal Control Levels, Action Levels, and regulatory limits. Annual releases to the air and water were both a very small fraction of regulatory limits. Public dose was estimated to be 0 µSv.

All production and possession limits were respected. Transportation of dangerous goods was conducted between suppliers, customers, and waste vendors without risk to workers, the public or the environment.

This annual compliance monitoring and operational performance report demonstrates that BWXT NEC has successfully met the requirements of the *Nuclear Safety and Control Act*, regulations and CNSC Class IB Nuclear Fuel Facility Licence requirements.