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Nordion®
A Sotera Health company

NORDION (CANADA) Inc.
CLASS 1B FACILITY

License Number: NSPFOL-11A.01/2025

2024 ANNUAL COMPLIANCE AND OPERATIONAL PERFORMANCE REPORT to the Canadian Nuclear Safety Commission for the period JANUARY to DECEMBER 2024

Signatures

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1. EXECUTIVE SUMMARY

This Annual Compliance and Operational Performance Report (ACOPR) provides performance and operational information for Nordion (Canada) Inc's (Nordion) Class 1B Facility. It reports annual performance against the Nuclear Safety and Control (NSC) Act, applicable regulations, relevant safety and operational programs and the license conditions of the Nuclear Processing Facility Operating License issued by the Canadian Nuclear Safety Commission (CNSC) (License NSFPOL-11A.01/2025) and demonstrates that Nordion is operating in a safe and responsible manner.

As per Nordion's license condition on annual reporting, this report contains information on the following:

- The operation and maintenance of the facility
- A summary of facility and equipment performance and changes
- Changes to operating policies and organization
- Occurrences and personnel radiation exposures
- Releases of nuclear substances and hazardous substances from the facility
- Changes to the emergency procedures, changes that affect or may affect the facility's emergency response arrangements, training activities, drill and exercise activities and unplanned events in which the facility's emergency response organization was tested
- The results of the effluent monitoring of the facility
- The results of environmental monitoring
- A summary of non-radiological health and safety activities, information on minor incidents and lost time incidents
- A summary of the Public Information Program activities
- A summary of Indigenous engagement
- The proposed 2025 Environmental, Health and Safety (EHS) Objectives

The key points of this report are as follows:

- All key measures were implemented to ensure continued compliance with Nordion's Licence Conditions Handbook (LCH).
- All measurable radiation doses received by personnel and the public were within the regulatory limits of 50 mSv/yr for Nuclear Energy Worker (NEW) personnel and 1 mSv/yr for non-NEW personnel (contractors) and the public.
- Nordion had no instances in which there was potential to exceed a regulatory limit.
- Nordion had 5 injuries, one lost time injury and four other injuries that required medical treatment. Injuries were related to ergonomics and slips and trips.
- Nordion had no non-radiological or radiological exceedances of any environmental regulatory limit or action level in 2024

In 2024, Nordion's Class 1B Facility operated within the requirements of the NSC Act, the applicable regulations and the conditions of the operating license issued by the CNSC save for three non-compliances with the NSC Act related to the regulations and within Nordion's site license NSPFOL-11A.01/2025. Nordion had five incidents that were reportable to the CNSC in 2024 (see Appendix A). All three non-compliances were of low-safety significance and were promptly corrected. All reportable incidents were promptly disclosed to ensure diligent and timely resolution.

TABLE OF CONTENTS

GLOSSARY

ACOPR	Annual Compliance and Operational Performance Report
ALARA	As Low As Reasonably Achievable
AOO	Algonquins of Ontario
AOPFN	Algonquins of Pikwakanagan First Nation
AMMS	Advanced Maintenance Monitoring System
BH	Borehole
BSI	British Standards Institution
CAPA	Corrective Action/Preventative Action
COF	Cobalt Operations Facility
[redacted]	
CNSC	Canadian Nuclear Safety Commission
CSA	Canadian Standards Association
DRD	Direct Reading Dosimeter
DRL	Derived Release Limit
EHS	Environment, Health and Safety
EM	Emergency Management
EMS	Environmental Management System
ERP	Emergency Response Program
FSAR	Final Safety Analysis Reports
HEPA	High Efficiency Particulate Air
H&S	Health & Safety
IAEA	International Atomic Energy Association
IMS	Incident Management System
ISO	International Organization for Standardization
KOB	Kanata Operations Building
LCH	Licence Conditions Handbook
MCA	Multi Channel Analysis
MDA	Minimum Detectable Activity
MSFS	Management System for Safety
NEW	Nuclear Energy Worker
NSC	Nuclear Safety and Control
NVS	Nuclear Ventilation System
PIV	Physical Inventory Verification
Q&A	Questions & Answers
RE	Roy Errington
SCBA	Self Contained Breathing Apparatus
TDG	Transportation of Dangerous Goods
TLD	Thermo-luminescent Dosimeter
US DOT	United States Department of Transportation
US NRC	US Nuclear Regulatory Commission
WSIB	Workplace Safety Insurance Board

1. INTRODUCTION

Nordion (Canada) Inc. (Nordion) is an indirect, wholly owned subsidiary of Sotera Health Company (Sotera Health), a leading global leader of mission-critical end-to-end sterilization solutions, lab testing and advisory services for the healthcare industry. Nordion's Class 1B Facility is dedicated to the manufacturing of sealed sources used in cancer therapy and irradiation technologies.

Production operations for Nordion are housed in the Cobalt Operations Facility (COF) portion of the Kanata Operations Building (KOB).

A summary of the organizational structure and key environmental, health and safety (EHS) personnel is provided in Section 2.1.5.

Throughout this report, Nordion has defined the following EHS risk significance definitions within its internal procedures:

- Low Risk – A finding or failure that will not result in negative impact to security, employee health and safety, the environment, registrations, or licenses.
- Medium Risk – A finding or failure that resulted or could potentially result in a negative impact to security, employee health and safety, the environment, registrations, or licenses.
- High Risk – An event or occurrence which has a major negative impact, or potential major negative impact on security, employee health and safety, the environment, registrations, or licenses.

1.1 Compliance with Other Regulations

Nordion reports to the Workplace Safety Insurance Board (WSIB) whenever a reportable occupational injury or illness occurs. In 2024, Nordion reported five medical treatment incidents, including one that was a lost time injury to WSIB.

As part of the transportation program, Nordion must remain compliant with not only CNSC regulations and requirements but also those of other regulators, most prominently Transport Canada (Transportation of Dangerous Goods (TDG) regulations), US Department of Transportation (US DOT) and US Nuclear Regulatory Commission (US NRC). There were no non-compliances to other transport-related regulatory authorities.

There were no reportable environmental releases that were required to be reported to the City of Ottawa in 2024.

There were no non-compliances related to the sealed and unsealed source reporting performed by Nordion to the Competent Authorities in France, Belgium, or Switzerland.

1.2 New Licensed Activities

There were no new licensed activities in 2024.

1.3 Significant Modifications or Changes to Site or Facility

Significant modifications and repairs that were carried out in 2024 include:

- The entrance area of the Cobalt Facility was widened to create an improved seating area for donning and/or removing PPE while entering or exiting the active area.
- Three sections of the water main pipe feeding the Nordion facility were upgraded to PVC pipe (from cast iron pipe) and a new shut-off valve was installed in the water main line.

1.3.1 Changes to Procedures Related to Operations Safety and Control

In 2024, the following modifications were made to procedures related to operational safety and control:

- QAP AP-45, "Change Control Procedure" was updated to pull out and implement in an independent quality plan the specific requirements related to US NRC regulations 10 CFR Part 71 Subpart H.
- Minor updates to SE-ERP-002, "Emergency Response Plan" to update roles/titles and make minor improvements.

1.4 Operational Challenges

In 2024, there were no significant operational challenges experienced by Nordion.

2. SAFETY AND CONTROL AREA

2.1 Management System

2.1.1 Applicable Activities

The Management System for Safety (MSFS) is applicable to all CNSC licensed activities conducted under the Class 1B nuclear substance and processing facility operating license. Licensed activities include those activities undertaken to operate a nuclear substance processing facility and to service prescribed equipment.

Nordion operates the facility for the manufacture of sealed sources for medical and industrial applications. Nordion manufactures sealed sources that are packaged and transported to be installed in prescribed equipment at another location or licensee. In addition, Nordion services its own self-shielded irradiator that is used to support the operations of the facility.

Nordion may also service, at the Class 1B nuclear substance and processing facility, prescribed equipment from other licensees and clients for which they have provided procedures to the CNSC. No such activity occurred in 2024.

2.1.2 Management System for Safety Program Effectiveness

The annual management review of the Environmental Management System (EMS) and the MSFS was conducted in July, 2024, by the EHS Committee to review the 2023 EHS Performance Report. This report assessed the performance related to the 14 Safety and Control Areas over the past three years. Any trends identified were addressed and tracked via a Nordion non-conformance system. The 2024 Environmental Objectives and Targets were reviewed. Resource requirements for the EMS and MSFS were discussed. The EHS Committee agreed that the programs are resourced adequately to ensure that critical issues were being addressed. Financial and specialized skills resources were assessed to be adequate.

The Committee concluded that they were satisfied with the effectiveness of the EMS and the MSFS.

In addition to the annual review, the EHS committee reviews the key metrics of the management system for safety program on a regular basis.

2.1.3 Internal and External Audits

Nordion uses both internal and external audits as a key part of the MSFS and the EMS.

2.1.3.1 Internal Audits

In 2024, there were twenty-three internal audits completed by Nordion EHS.

In addition, as part of the inspection program, Nordion conducted a total of twelve health and safety inspections, and ten environmental and fire inspections.

These audits included an audit of production areas and supporting functions as well as policy and program elements.

All findings were actioned using Nordion’s corrective action system.

2.1.3.2 External Audits of Nordion

In 2024, external audits of Nordion were conducted by CNSC, British Standards Institution (BSI) and International Atomic Energy Association (IAEA) in March, April and October respectively.

The inspections topics and their results were as follows:

CNSC Inspection Topic	Result
General Type II	Two recommendations
Fire Protection	Three non-compliances and one recommendation

The CNSC findings for the General Type II, and Fire Protection inspections have been addressed.

BSI Inspection Topic	Result
ISO 14001	One minor non-conformance and six opportunities for improvement that have been addressed.

IAEA Inspection Topic	Result
Physical Inventory Verification (PIV)	No findings

2.1.3.3 External Audits Conducted by Nordion

Nordion conducted one EHS audit of a supplier in 2024. There were no non-conformances resulting from the supplier audit.

2.1.4 Management System for Safety Program Improvements

There was no revision or changes to the overall Nordion MSFS Program in 2024.

Improvements were made to specific parts of the MSFS program such as to the Radiation Protection (RP) Program, Conventional Health and Safety Program, the Environmental Protection Program, the Emergency Preparedness Program, and the Fire Protection. These are discussed in Section 2.7.8, 2.8.3 and 2.9.7, 2.10.4 and, 2.10.8, respectively.

2.1.5 Summary of Organizational Structure and Key EHS Personnel

Nordion is an indirect, wholly owned subsidiary of Sotera Health Company and operates as a stand-alone company.

The list of EHS personnel for Nordion as of December 2024 is provided below.

Nordion – EHS Compliance

- Senior Vice President EHS (Sotera Health Company)
- Director, Regulatory & EHS
- Director, Global Security
- Manager, Global Security
- Contract Security Analyst

- Contract Security Supervisor
- Contract Security Assistant Supervisor
- Contract Security Protection Officers [redacted]
- Manager, Radiation Safety & Nuclear Transportation
- Radiation Surveyor
- Junior Radiation Surveyor
- Senior EHS Compliance Specialist (2)
- Senior Licensing Coordinator
- Senior EHS Specialist / Radiation Safety Officer
- Manager, EHS
- EHS Compliance Specialist
- EHS Specialist

2.1.6 Changes to the Organizational Structure and Roles and Responsibilities of Key Personnel in 2024:

EHS Compliance Organization Changes:

- A new Senior Vice President EHS (Sotera Health Company) was hired
- A new Junior Radiation Surveyor was hired

2.2 Human Performance Management

2.2.1 Overall Performance of Human Performance Management

Employee training was provided in accordance with QAP AP-47 “Training Program and Management System” and SE-TRN-006 “Systematic Approach to Training System”. Nordion provides EHS training for all employees as per SE-TRN-003 “Compliance Environmental, Health and Safety Training”. In 2024, Nordion’s training program continued to meet the requirements of CNSC REGDOC-2.2.2, “Personnel Training” and License Condition 3.1 of the Nordion LCH for the implementation and maintenance of a training program.

Nordion’s Change Control procedure, QAP AP-45, required that training requirements be assessed and documented for procedural changes. These requirements include assessment of the roles assigned to the document, the level of training to be completed and the training completion time. Most controlled documents require “read and understand” training regardless of the impact of changes. Change Leaders were required to consult with relevant managers and determine whether the read and understand training needed to be supplemented by instructor-led classroom training and/or On-The-Job-Training. For changes assessed to have a high or medium risk safety impact, a “Training Needs Analysis” must be completed and EHS must review and approve of the final training decision.

2.2.1.1 Training Attendance Rate

Nordion designed and maintains a variety of radiation safety training courses. New employees who are not classified as Nuclear Energy Workers (NEWs) receive a basic course on EHS which provides information on the facilities, emergency response procedures and alarms, and basic procedures for safety in the workplace. NEWs received a NEW Indoctrination Course. To be authorized to enter the Active Area unescorted, the employee must complete and pass a written test, as evidence of understanding the principles of radiation protection and Nordion safe work practices. NEW retraining and retesting are conducted on a three-year frequency. In addition, NEWs are provided with a half day Radiation Instrumentation Workshop, dealing specifically with the selection and use of radiation survey and contamination meters for the Active Area. In 2024, there were no radiation safety incidents attributed to employee radiation safety practices. This is an indication that the radiation safety training is effective.

Supplementary training programs are provided to all personnel working on behalf of Nordion depending on the nature of the job and the requirements specified by their manager. These programs include but are not limited to topics such as emergency response awareness, care and use of respirators, material handling training, and working safely with fume-hoods.

Employees who transport, handle, or offer dangerous goods for transport are trained in the TDG requirements. The training program includes an online course training that is required once on employment or upon job change. Retraining is conducted on a two-year frequency.

A summary of the key safety training programs is provided in Table 1.

In 2024, the number of scheduled participants that required safety training was 300, and by the end of the year, 292 of the scheduled participants completed the training, which included refresher training. Therefore, the actual attendance completion rate for 2024 was 97%. The uncompleted trainings from 2024 have all been completed, with the exception of 2. For the two remaining, those employees have been removed from the associated tasks until training can be scheduled and completed. Employees are restricted from undertaking work they are not trained on.

Table 1
2024 Safety Training Programs

Program	Number of Participants Requiring Training in 2024	Number of Participants Completed Training in 2024
Nuclear Energy Worker (NEW) Indoctrination[3] and NEW Refresher	28	27
Radiation Instrumentation Workshop[3]	27	24
Radiation Safety Review for Operators[3]	16	14
TDG online	4	4
TDG Advance	4	4
Crane	20	19
Pallet Truck	5	5
Forklift	12	11
Contractor Radiation Safety Protection Training[3]	45	45
Contractor Radiation Safety Protection Refresher[3]	35	35
Contractor EHS Training Level I[3]	62	62
In-Depth Security Awareness[3]	3	3
Emergency Response Part 1[3]	1	1
Emergency Response Part 2[3]	3	3
Emergency Response Part 3[3]	5	5
Emergency Response: Security[3]	12	12
Emergency Response: Site Security Volunteer[3]	1	1
Emergency Response: Monitors[3]	0	0

Self Contained Breathing Apparatus (SCBA) Part 1[3] and 2[3]	17	17
TOTAL	**300**	**292**
[3] Key EHS course		

2.2.2 Evaluation of Training Effectiveness

2.2.2.1 Trainee Reaction

Trainee reaction is the degree to which participants find the training favourable, engaging, and relevant to their jobs. These three components are evaluated by analyzing data collected through the completion of training evaluation forms for all internally developed key EHS training courses and delivered by EHS classroom instructors. The data is analyzed so that corrective actions can be taken, if necessary, to improve content and delivery. The degree to which trainees find the training favourable is evaluated by analyzing the overall training assessment rating for each course. Overall training is assessed as one of five ratings: Excellent, Very Good, Good, Poor or Very Poor. The training evaluation form allows the trainee to select which aspects related to training engagement and relevance they perceived as strengths or weaknesses. In addition, a review of the optional comments section is completed to identify any issues that would contribute to trainees' discomfort and distraction that could have impacted employee engagement such as room temperature, catering, lighting etc.

In 2024:

- 100% of course evaluation forms had an overall rating of good, very good or excellent. Overall trainee satisfaction remains high.
- Training courses were perceived by trainees as engaging and relevant, and trainees felt participation was encouraged.

2.2.2.2 Trainee Learning

Trainee learning is the degree to which trainees acquire the intended knowledge and skills based on their participation in the training. Learning is evaluated by the pass rate of tests written for key EHS training courses.

In 2024, 100% of trainees passed the assessment test for all key EHS training courses and there were no rescheduled tests due to failed attempts.

2.2.2.3 Training Results

Training results is the degree to which targeted outcomes occur as a result of the training. The effectiveness of training results is measured by the EHS significance (high, medium, and low) and the frequency of unplanned events documented through processes such as the deviation process, the non-conformance process, investigations, and customer complaints where the root cause was determined to be related to human error or training. The targeted outcome is zero high risk unplanned events related to human error or training as well as no trend for recurrence (three or more) of the same unplanned event with the same human error or training root cause.

In 2024, there were no unplanned events where the root cause was attributed to Nordion training or human error.

2.2.3 Confirmation of Sufficient Number of Qualified Workers

In 2024, Nordion ensured that at least the minimum number of responsible personnel were available to provide safety during overnight operations and during emergency situations. There were no changes to risk levels or available personnel.

Nordion Security is always on-site. Radiation Surveyors are always on site when production involving radioactive materials is occurring. Nordion's key emergency response personnel, Facilities and Production Managers are on-call at all times. The Incident Manager, or the person in charge of the response, can initiate a call-in of both on-call and regular emergency response personnel. Currently, there are approximately 55 Fire Wardens and Marshalls and over 100 other emergency response personnel. Because both Nordion and BWXT Medical operate different portions of the same facility, the emergency response program and roles continue to include personnel from both Nordion and BWXT Medical as needed.

Nordion routinely assesses the availability of qualified staff as part of the Emergency Response Program and through drills and exercises. Nordion tests its emergency call list annually and the results have demonstrated year over year that within one hour of the onset of an emergency, adequate emergency response personnel and at least one representative from each of the key emergency response groups would be available on-site (see Section 2.10).

There is at least one and normally two Health Physicists on-call who are qualified to establish and direct radiation safety activities to protect personnel, the public, and the environment from radiation hazards, and to develop safe work methods and procedures.

Nordion maintains a formal on-call roster that includes the Manager, Global Security (or designate) and the Director, Regulatory/EHS (or designate), who is also a qualified Health Physicist.

2.3 Operating Performance

2.3.1 Effectiveness in Carrying Out Licensed Activities

Licensed activities were carried out in accordance with Nordion's programs, policies and procedures resulting in no significant unplanned events.

Nordion's programs that are in place for auditing and capturing non-conformances continue to identify issues in areas that require corrective actions. These processes functioned as expected.

The 2024 EHS program objectives and results are shown in Table 2.

Nordion diverted 64.3% of waste from landfills.

Nordion completed an EHS supplier audit in 2024.

A system is in place to ensure that the manager self-assessment performance reviews are completed twice a year. The self-assessment process is audited annually. Deviations, Change Forms, and complaints are reviewed yearly at the Annual Joint EMS and MSFS review.

Table 2
2024 EHS Program Objectives and Results

Objective	Measure/Target *	Result
Timely CAPA Closure	• Ensure timely closure of CAPAs (90% completed within 60 days) • CAPAs greater than 180 days < 5 • No overdue compliance action items	• 82% CAPAs completed within 60 days (>90% for 2nd half of the year) • 1 CAPAs greater than 180 days • 0 overdue compliance action items
EHS Management System Effectiveness	• Ensure timely closure of CAPAs (90% completed within 60 days) • CAPAs greater than 180 days < 5 • No overdue compliance action items • No EHS critical training overdue (0)	• 82% CAPAs completed within 60 days (>90% for 2nd half of the year) • 1 CAPAs greater than 180 days • 0 overdue compliance action items • See Table 1

Minimize the number and extent of occupational injuries	• The number of Medical Treatment Incidents = 0 • Lost time Incidents = 0	• The number of Medical Treatment Incidents = 4 • Lost time Incidents = 1
Minimize the use and release of hazardous materials to the environment and ensure adherence to permissible levels	• Radioactive materials emissions to < 2.0% of the Derived Release Limits (DRL) (Ottawa). • No (0) reportable releases of radioactive and non-radioactive hazardous materials to the environment (sanitary or storm sewer, air, groundwater, land)	• Radioactive materials emissions = 0.083% DRL (Ottawa) • Reportable releases of radioactive and non-radioactive hazardous materials to the environment (sanitary or storm sewer, air, groundwater, land) = 0
Actively limit radiation doses to employees as per ALARA principle	• Maximum employee dose rate < 6.5 mSv/yr	• Maximum employee dose rate = 4.28 mSv/yr
Maintain a healthy safety culture. *	• Actively participate in the behavioural based safety culture program (Sotera Health Culture Program, safety discussions and training as applicable) o Target: 90% Manager participation rate • Immediately report, and where possible, take appropriate corrective action on near-misses and hazard identifications o Target: Safety Improvement Rate – 100 (approximately 1 per employee) (includes near miss reports, hazard identifications, etc.). o Target: 30 safety walkthroughs over the year • IMMEDIATELY REPORT (within the same shift) work related injuries and suspected ergonomic symptoms (early onset pain) to your Manager*	• Actively participate safety culture program o 88% participation rate • Immediately report, and where possible, correct near-misses and hazard identifications o Safety Improvement Rate = 103.2 o Safety walkthroughs over the year = 46

***** Note: Some Health and Safety Targets have been established to promote safety culture only and are therefore not measurable.

2.3.2 Effectiveness in Implementing Operational Controls and Improving Safety Culture

EHS operational controls are documented in a specific series of documents (SE-OP and SE-HS series) and safety critical steps are added into routine production procedures. These procedures are routinely updated using Nordion's change control process when safety improvements are identified or during the document's scheduled periodic review.

In 2024, Nordion continued the practice of regular safety awareness campaigns to encourage safety discussions within the organization and to encourage employees to report near misses and hazard identifications.

2.3.3 Reportable Events

A list of CNSC reportable incidents, their causes and corrective actions is provided in Appendix A.

2.3.4 Sealed Source Tracking

Nordion has a process for reporting the transfer, receipt, export or import of sealed sources if the activity exceeds the threshold limits and within the specified timeframes as detailed in Nordion's LCH.

2.3.4.1 Sealed Source Tracking Activities

Throughout 2024 Nordion provided reporting to the CNSC for all Co-60 sealed source shipments and receipts.

In 2024, there were no incidents related to sealed source reporting.

2.3.4.2 Sealed Source Tracking Improvements

There were no significant changes or improvements made to the sealed source tracking program in 2024. SE-OP-079, "Sealed Source Tracking" was updated in 2024 to make general improvements and to better define the process for reallocating sources that have already been reported to the CNSC-SSTS.

2.3.5 Non-production Sealed and Unsealed Source Inventory

The inventory of non-production sealed and unsealed sources is provided in Appendix B.

2.3.6 Annual Production

Activities relating to the procurement, possession, processing, and shipping of radioactive materials are conducted under Nuclear Substance Processing Facility Operating Licence, NSPFOL-11A.01/2025.

2.3.6.1 Sealed Source Manufacturing/Radioisotope Processing

The 2024 data on sealed source manufacturing is shown in Table 3.

Table 3
Sealed Source Manufacturing
Activity in PBq (kCi)

Radioisotope	Total Processed in 2024	Total Shipped in 2024
Co-60	[redacted]	[redacted]

2.3.6.2 Processing >1 Petabecquerel (PBq)

Nordion has processed and shipped quantities of activity greater than 1 PBq of Co-60. In 2024, the quantities of Co-60 processed and shipped was [redacted] and [redacted] respectively.

2.3.6.3 Acquisitions of Finished Sealed Radioactive Sources

Sealed radioactive sources acquired by Nordion in 2024 included Co-60 double encapsulated sources that have been returned from customers.

[redacted]

[redacted]

2.3.6.4 Sealed Sources/Devices >50 Megabecquerels (MBq)

[redacted]

2.4 Safety Analysis

2.4.1 Validation and Maintenance of Overall Safety Case

The overall Nordion safety case for the facility is effectively maintained in the primary Final Safety Analysis Reports (FSARs) for Cobalt Operations and the Cobalt Pools. When modifications are made, an assessment is performed and details are captured in the primary FSARs for the facility. The overall safety case for the facility is then validated by the EHS Committee.

2.4.2 Modifications and Changes to Facility that May Affect Safety Analysis

In 2024, there were no modifications that affected the facility's safety analysis.

In 2024, the two primary FSARs for Cobalt Operations and the Cobalt Pools were updated and approved by the CNSC. Also, the secondary FSARs for Waste Management Operations and the Waste Diversion Program were updated in 2024. All the updated FSARs were approved by the EHS Committee as required.

2.5 Physical Design

The FSAR review process identifies areas of continuous improvement to ensure that the overall design basis for the facility is both validated and maintained. In 2024, there were no significant design issues identified through these reviews. Overall, Nordion's facility design has been maintained.

Facility modifications and additions occurring in the leased areas (BWXT Medical) did not impact the ability of the facility structures, systems and components to meet and maintain their design basis.

2.6 Fitness for Service

2.6.1 Effectiveness of Maintenance and Testing Programs

Nordion has a system in place for the maintenance and control of equipment that supports the facility. The program provides guidelines for the documentation and maintenance of the system to ensure responsibilities are identified, filing systems are maintained, and all necessary controls are in place for facility calibration and maintenance.

Nordion uses an Advanced Maintenance Management System (AMMS) to control Nordion's calibration and maintenance activities. The AMMS is used to catalogue all equipment requiring calibration or maintenance, record equipment information, schedule maintenance, and issue work orders.

Detailed processes and rules governing the preventative maintenance program are available in Facilities Master Plan documents.

The AMMS provides the necessary oversight to ensure equipment integrity. All equipment inspections and preventative maintenance schedules are dictated using the AMMS.

Unscheduled repairs are reviewed on an annual basis by the Facilities department to assess for trends in equipment failures. Recurring failures are reviewed by EHS Compliance for the determination of any additional corrective actions.

This continues to prove effective as during 2024, there were no major equipment failures.

2.6.2 Effectiveness of Aging Management Strategies

Every year a detailed review is carried out to discuss aging equipment at the site. This annual business plan review considers three criteria: safety of the facility, regulatory requirements, and site improvements. When approved, the work identified during the aging equipment review is executed as a project. Projects are prioritized into three categories and funds are allocated as required. This aging equipment review process, overseen and approved Senior Management team and Finance, has been effective in keeping the Nordion facility up to date with current technology.

2.7 Radiation Protection

2.7.1 Dose Control Data

2.7.1.1 Occupational External Dosimetry

Table 4 provides dosimetry data for employees grouped in various ranges of exposure. In 2024, a total of 159 employees were monitored. Only the Whole-Body and extremity doses are provided. The skin and lens of the eye doses are typically equivalent to the whole-body dose since Nordion processes Co-60, a high-energy gamma emitter. Of the 159 employees monitored, 49 were active area employees and 110 were non-active area employees. Of the 110 non-Active Area personnel, 12 support industrial irradiators (containing Co-60) work at customer sites. These individuals are included in the Class 1B licence dosimetry as they may also receive dose from work at the Nordion facility during the dosimetry year. In 2020, the numbers of employees in the table included those employees now working under the BWXT Medical licence.

Table 4
Personnel Dosimetry

Number of Employees					
Dose Range (mSv)	Whole Body				
	2020	2021	2022	2023	2024
0	70	18	44	10	25
0.01 - 1.00	219	61	52	107	95
1.01 - 5.00	35	28	35	40	39
5.01 - 10.00	0	0	0	0	0

Number of Employees										
Dose Range (mSv)	Right Hand					Left Hand				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
0	61	14	10	14	7	93	13	10	12	9
0.01 - 1.00	50	7	12	12	13	23	7	10	14	11
1.01 - 5.00	38	15	19	22	21	33	16	21	21	21
5.01 - 10.00	3	2	0	0	1	3	2	0	1	1
10.01 - 20.00	1	0	0	0	0	1	0	0	0	0
>20	0	0	0	0	0	0	0	0	0	0

Table 5
Average, Maximum and Minimum Worker Effective Doses (mSv)

		2020	2021	2022	2023	2024	CNSC Regulatory Limit
NEWs	Average	0.36	0.8	0.71	0.76	0.71	n/a
	Average*	0.46	0.96	1.07	0.81	0.85	n/a
	Maximum	4.92	4.3	4.29	4.58	4.28	50/yr 100/5yr
	Minimum	0	0	0	0	0	n/a
	Number of NEW monitored	324	107	131	157	159	
Contractors	Average	0.01	0.04	0.03	0.02	0.02	n/a
	Average*	0.03	0.06	0.04	0.05	0.05	n/a
	Maximum	0.29	0.30	0.29	0.26	0.18	1/yr
	Minimum	0	0	0	0	0	n/a
	Number of NEW monitored	381	53	40	51	80	

* This average is calculated excluding zero dose values.

Table 6
Minimum, Maximum and Average Worker Extremity Doses (mSv)

		2020	2021	2022	2023	2024	CNSC Regulatory Limit
NEWs	Average	0.93	1.56	1.32	1.35	1.67	n/a
	Maximum	16.48	7.73	4.94	5.23	7.03	500/yr
	Minimum	0	0	0	0	0	n/a
	Number of NEW monitored	153	38	42	48	42	

Table 5 and 6 provides maximum and average doses to NEWs.

Contractor doses continue to be well managed and controlled. There was no change in average dose since 2023. The maximum doses to contractors decreased compared to previous years.

In 2024, there was one exceedance of a Nordion action level related to a NEW dose. In the first quarter of 2024, a dosimetry report from Nordion's dose service provider indicated a whole-body dose of 2.85 mSv for a Nordion employee. Although the dose was well within the regulatory limits, it reached the Nordion action level threshold of 2.0 mSv per report. It was determined that the employee's TLD had been x-rayed at the airport during his travel. The Direct Reading Dosimeter (DRD) log for the employee was checked and the DRD dose

estimation for this period was 0.001 mSv. This event was reported to the CNSC and a correction to the National Dose Registry was made.

Table 5 and 6 shows continued good performance in whole-body and extremity dose relative to the CNSC Regulatory Limit.

The above analysis of trends demonstrates doses are well managed at Nordion and adherence to the principle in the execution of duties by Nordion personnel.

2.7.1.2 Internal Occupational Radiation Doses

Nordion's bioassay program includes whole-body counting if air contamination monitoring indicates a need. In 2024, Nordion had a non-reportable contamination event that had the potential for employee inhalation of Co-60. Three employees were sent for off-site whole-body monitoring. Two employees had Co-60 inhalation doses of 0.01 mSv and 0.005 mSv and the third employee had no measurable uptake of Co-60. These doses are a fraction of the external dose that these employees typically receive in a month.

2.7.2 Significance of Results for the Dose Control Data

The group with the highest average dose (2.60 mSv per employee) is the Cobalt production technicians. For this group, the average dose in 2024 (2.60 ± 1.12 mSv) was consistent with the 2023 average dose for this same group (2.69 ± 1.36 mSv).

The other group that accounts for Nordion's doses are the Monitoring, Decontamination, and Shipping group. The average dose in 2024 was 2.48 ± 1.15 mSv. This is a slight increase from 2023 (2.2 ± 1.1 mSv).

Non-active area personnel include [redacted] personnel that are part of Nordion's installation and services team that performs work at customer sites. This group has the highest average dose for non-active area personnel. In 2024, the installation group had an average dose of 0.85 ± 0.79 mSv, with a max dose of [redacted]. Results overall demonstrate continued and consistent high performance of Nordion employees in accordance with ALARA.

2.7.3 Dose to the Public

Table 7 shows the calculated doses to the public from 2020 - 2024. This dose represents the combined dose to the public from Nordion and BWXT Medical activities that occur on the site. The doses to the public from combined Nordion and BWXT Medical activities at the site remain well controlled and below the limit of 1 mSv/year.

Table 7

Dose to Public

Year	(mSv)
2020	0.00122
2021	0.00185
2022	0.00156
2023	0.00095
2024	0.00102

2.7.4 Contamination Control Data

The contamination control program for the Active Area includes routine sampling and daily monitoring of the floors, benches, fume-hoods, gloveboxes, support/service areas, and on a weekly basis, change-rooms and inactive floors. Regular sampling, by wipe testing, of the corridors and office areas is conducted several times daily to ensure areas are maintained contamination free and, should contamination be found, to decontaminate immediately to the levels specified in the decontamination procedure. In addition, equipment and personnel leaving the Active Area are monitored for contamination.

During 2024 operations, there were 27 instances where contamination was found and subsequently contained within the Active Area. Of the 27 contamination incidents, 6 were related to contamination found on clothing and 21 were related to contamination found on equipment or floors.

The distribution of contamination incidents from 2020 to 2024 is shown in Table 8 and illustrated in Figure 1.

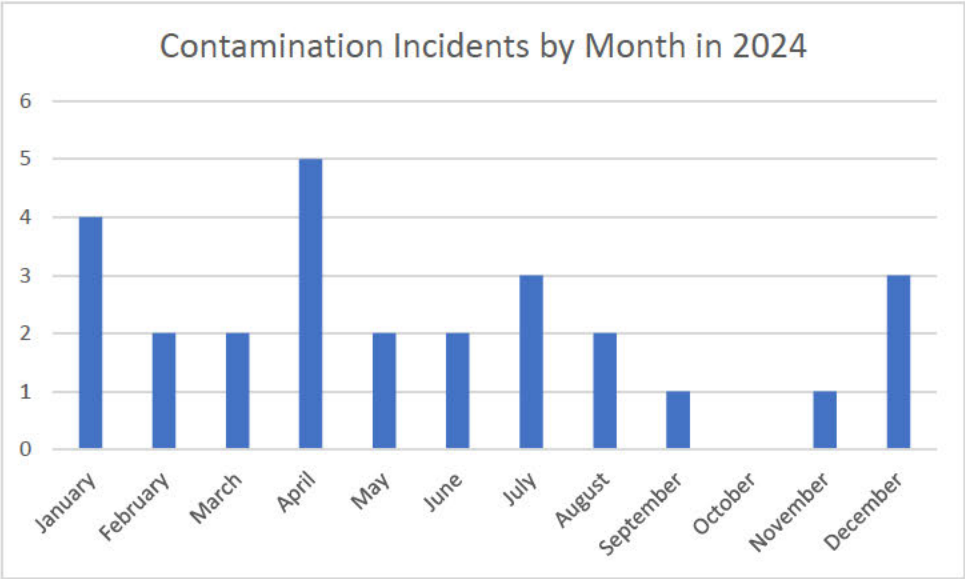
The main isotope identified during the contamination events is Co-60. Currently, Co-60 is the only isotope processed within the Cobalt Operations facility. The number of Co-60 contamination events in 2024 is lower than the Co-60 contamination events in 2023. All events were reviewed by surveyors and the noted contamination events did not result in any increased doses to personnel. Nordion will continue to monitor contamination events to assess areas for potential improvement.

Nordion's contamination control program continues to be well managed and meet the conditions of the licence.

Table 8
Contamination Incidents by Contamination Level

Year	Not recorded	<500 cpm	>500 cpm, <2,000 cpm	>2,000 cpm, <10,000 cpm	> 10,000 cpm, < 50,000 cpm	>50,000 cpm	Annual Total	Total Co60 Contamination Incidents
2020	0	6	8	4	3	1	22	5
2021	0	0	3	4	1	1	9	9
2022	0	5	1	7	3	0	16	16
2023	1	2	5	16	10	4	38	38
2024	0	1	1	10	12	3	27	27

Figure 1
Contamination Incidents by Month in 2024



2.7.5 Facility Radiological Conditions

The radiation survey program involves radiation measurements within the Active Area, and on the perimeter and exterior of the building. Within the Active Area, radiation surveys are generally conducted daily, throughout all the labs and rooms. Areas where radiation fields are above 2.5 mrem/hr (0.025 mSv/hr) are posted with radiation warning signs, indicating the radiation fields. In addition, surveys are conducted at employee work areas, at cells, and fume-hoods, during production and test operations, to ensure radiation fields during processing are within acceptable levels. Special surveys are conducted on new processes/equipment to provide information on the safety performance of new operations.

On a monthly basis, radiation surveys have been conducted on the perimeter of the Active Areas, and within the Inactive Office Areas. The monthly survey also includes measurement of radiation fields outside the KOB to ensure conditions have not changed in the operations that may impact the environment/exterior exposure. All the monthly surveys were conducted in 2024.

Breathing air was monitored at various locations in the facility. In addition to having the capability of alarming locally, Continuous Air Monitors are monitored and logged at the Surveyor's control panel and on the building monitoring system.

For work known to have the possibility of creating radioactive contamination of the breathing air, a zone is demarcated and signage is posted requiring respirators to be worn. Respirator requirements are removed only once air monitoring measurements are below the required levels. In 2024, all breathing air sampling was performed in accordance with procedures and results indicated that processes were in control. Facility radiological conditions were stable and routine in 2024. There were no fluctuations in 2024 radiological conditions beyond the routine movement of containers through the facility when required. Contamination incidents are discussed in Section 2.7.4.

2.7.6 Exceeding Regulatory Limits or Action Levels

In 2024, there was one exceedance of a Nordion actions limit due to a dosimetry badge inadvertently being sent through an airport x-ray scanner. This event is discussed in 2.7.1.

2.7.7 Radiation Protection Program Effectiveness

The Radiation Protection (RP) Program is reviewed by conducting process audits and process safety audits. Data and performance of the RP Program is also reviewed regularly at EHS Committee meetings. The RP Protection program continued to operate effectively in 2024.

2.7.8 Radiation Protection Program Improvements

There were no significant changes to the RP program in 2024. The RP program continued to operate effectively in 2024.

2.7.9 Radiation Protection Program Performance

The objectives, goals and targets of the RP Program are shown in Table 2 of Section 2.3.1. The targets for maximum NEW dose and environmental releases were met in 2024. These targets are tracked as key performance indicators at EHS Committee meetings and in Monthly Operational reports. The targets are reviewed yearly at the Annual Joint EMS and MSFS Review. See Section 3.2 Table 18 for a summary of the initiatives and targets for the upcoming year.

2.7.10 Continuous Improvements under ALARA Performance

ALARA objectives and performance is reviewed at EHS Committee meetings and all activities in the ALARA program are outlined in Nordion's internal procedure "Keeping Radiation Exposures and Doses as Low as Reasonably Achievable" (SE-RP-002). Safety is integrated into the design aspects of new builds, from design objectives, design review and to performing Hazard Risk Analysis and Third-Party Reviews of process flows.

2.7.11 Radiation Devices and Instruments Performance

Performance of the following equipment, alarms and monitoring devices is checked at various frequencies throughout the year. Maintenance is performed for any tests that are out of specification.

In 2024, the following testing was performed:

- Nuclear Ventilation System (NVS) High Efficiency Particulate Air (HEPA) filters are required to be tested yearly. All HEPA filters were tested within the annual frequency and HEPA specifications were met.
- The emergency generators were tested monthly and confirmed to be operational.
- The radiation evacuation alarm was tested weekly and confirmed to be fully functional.
- The radiation alarms throughout the facility were tested on a weekly basis in 2024. The tests verified that the alarms sound at the pre-set alarm levels and that the alarms register on the Building Management System (BMS).
- The sprinkler system fire system was tested monthly in 2024 and found to be operational. All dry systems were tested and verified in good operating condition in 2024 as required by the National Fire Protection Association.
- The fire alarm panels were tested monthly and found to be fully functional.
- Handheld contamination monitoring equipment is maintained twice a year. Hand & Foot and Whole-body area monitors are checked weekly. Area monitors are checked daily.
- Air sampling pumps were tested on a weekly basis.

- Radiation survey instruments were tested on a monthly, bi-annual, or annual basis as required. Radiation instruments that do not meet the calibration check specifications are sent for repair and service. Nordion maintains an inventory of radiation survey instruments to ensure sufficient radiation instruments are available at all times.

There were no trends identified in 2024 relating to radiation instruments.

2.7.12 Radiation Protection Training Program and Effectiveness

See Section 2.2.1 and 2.2.2.

2.8 Conventional Health and Safety

2.8.1 Conventional Health and Safety (H&S) Program Effectiveness

The Conventional H&S Program is reviewed by conducting program audits, process audits, regular inspections by both employees and management, and a review of revised safety programs is performed by the Workplace H&S Committee. The Workplace H&S Committee is also responsible for reviewing the Hazard Prevention Program. In addition, the EHS Committee sets targets each year that are used to monitor the effectiveness of the safety program.

Near Miss Reports and Hazard Identification Reports were tracked and reported monthly to senior management and were provided to the EHS Committee for review.

Process safety audits are conducted annually.

See Section 2.1.3 for a description of audits and inspections for 2024.

2.8.2 Conventional H&S Committee

The Nordion Workplace H&S Committee is represented by union and management and typically meets monthly.

The Nordion Workplace H&S Committee met eleven times in 2024. The 2024 accomplishment for this Committees was their continued review of new or changes to existing EHS policies and programs. In addition, the Workplace H&S Committee continued to review ergonomics as a standing agenda item for each meeting.

2.8.3 Conventional H&S Program Improvements

Improvements to the Conventional H&S Program in 2024 included the following:

- Continued to implement behavioural based safety awareness campaign
- Hosted a Safety Week in June 2024 to continue to raise safety awareness
- Developed and updated training, including Lyme Disease, Inspection – Preventing Cuts and Lacerations, Ergonomics and Musculoskeletal disorders
- Implemented an early injury intervention program to address ergonomic risks

2.8.4 Conventional H&S Occurrences

During 2024, there were five medical treatment incidents, which included one lost time injury. The details are summarized in Table 9 below. Figure 2 illustrate the Number of Incidents by year and the Number of Days Lost by year respectively.

Table 9
Medical Treatments Incidents

Medical Treatment Injury	Actions Taken
Employee injured shoulder working on cell 3 (Medical Treatment)	1) Replaced manipulator 2) Implemented stretching program to help minimize ergonomic strain

Employee injured shoulder doing pool work (Medical Treatment)	1) Conducted an Ergonomic Assessment of pool work 2) Implemented stretching program to help minimize ergonomic strain
Employee was moving empty cardboard and swung their hand hard. They banged their thumb and index finger on the underside of the waste bin. (Medical Treatment)	1) Reinforced with the team the requirement to wear cut resistant gloves and use safe cutting tools 2) Reviewed housekeeping where this activity was taking place and cleared area of congestion 3) Developed and implemented a Hand Protection Safety Talk
Facilities employee tripped on chair dolly injuring their knee (Lost Time)	1) Reviewed workplace processes and equipment with teams 2) Purchased new chair dolly(s) with handles to increase visibility
Employee slipped while changing a safety valve injuring knee (Medical Treatment)	1) Reviewed workplace processes & equipment with Mechanical team and determine if there are revised processes/equipment that could help prevent similar incidents in the future. 2) Redesigned safety valve to ensure proper space is available to safely replace valve in the future 3) Installed covers/barricades over floor lines

Figure 2
Number of Medical Treatments and Lost Time Incidents by Year

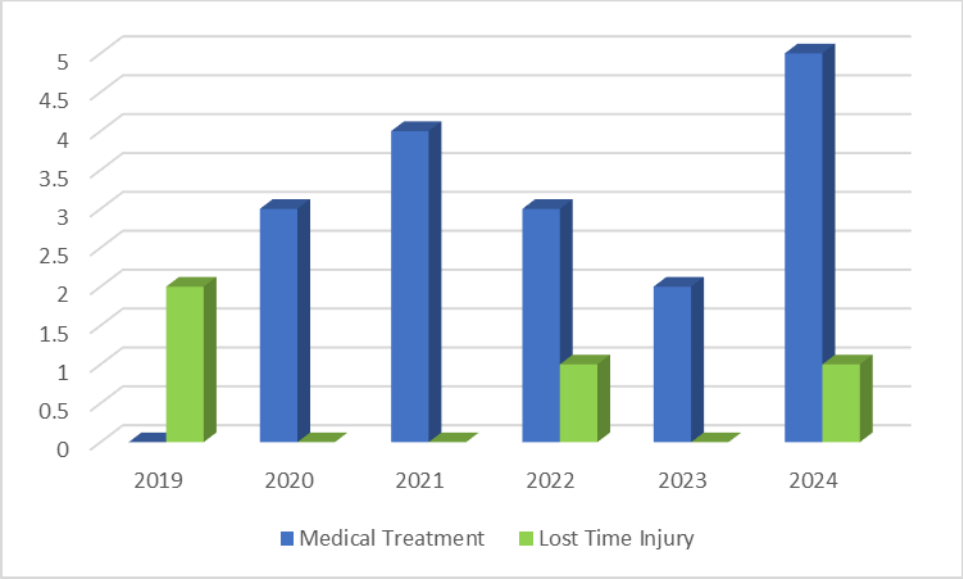


Table 10
Nordion Lost Time Injury Statistics for 2024

# Lost-Time Injuries[1]	1
Severity Rate[2]	2.55
Frequency Rate[3]	0.51

1 An injury that takes place at work and results in the worker being unable to return to work for a period of time.

2 The accident severity rate measures the total number of days lost to injury for every 200,000 person-hours worked at the site. Severity = [(# of days lost in last 12 months) /(# of hours worked in last 12 months)] x 200,000.

3 The accident frequency rate measuring the number of LTIs for every 200,000 person-hours worked at the site. Frequency = [(# of injuries in last 12 months) / (# of hours worked in last 12 months)] x 200,000

2.9 Environmental Protection

2.9.1 Air and Water Release Monitoring

The environmental monitoring program is designed to monitor and measure effluent releases to the environment and to determine radiation levels in areas exterior to the KOB. The program includes the following elements:

a) Continuous monitoring of process ventilation, exhausts ductwork, and stack emissions by use of in-situ detectors and samplers and computerized recording
b) Weekly air sampling and analyses for KOB exhaust stack emissions
c) Holding tanks for Active Area liquid effluent to allow sampling, analysis, and authorized release of liquid effluent
d) Environmental TLD program
e) Soil sampling
f) Groundwater sampling

Ventilation and stack sampling is conducted by using particulate filters. Particulates are sampled by use of cellulose filter papers and analyzed by gamma measurement.

All production operations are contained within cells and/or fume-hoods. Ventilated air from these containment systems is filtered through roughing and HEPA filters. These systems are designed with redundant fan/motor and filtration units that include pre-filters, primary and secondary filtration units. The NVS has been designed and is maintained to prevent the unnecessary release of radioisotopes to the atmosphere.

2.9.1.1 Airborne Effluent

In 2024, there was air release of Co-60 material equal to 0.000322% of the DRL (see Table 11). No Action Levels were exceeded. There was no significant contribution to dose to public from air releases in 2024.

Table 11
Airborne Releases

Year	Co-60 (GBq/yr)
2020	0
2021	0.00004
2022	0.0003
2023	0.000001

2024	0.00081
Action Levels (GBq/week)	0.001

	Co-60
DRL (GBq/yr)	250
% DRL	0.000322

2.9.1.2 Liquid Effluent

Allowable liquid effluent releases to the environment are also limited to values in SE-OP-013 "Water Effluent Monitoring". The 5-year variation in activities released is listed in Table 12. Each release of liquid effluent in 2024 was well below the values in SE-OP-013 (exceedance of which would be Action Level reporting). All liquid effluent releases have been below the Nordion action levels and well within CNSC licensed limits. A summary of liquid releases, expressed as a % DRL, is provided in Table 12.

The City of Ottawa is informed whenever a release to the sanitary sewer takes place. In addition, a monthly summary report of the activity levels released is provided to the City of Ottawa.

Note that liquid release activity measurements have an uncertainty of ±10%.

In 2024, delay tanks were held on [redacted] occasions (versus [redacted] in 2023) for sampling, analysis and verification against the constraints in Nordion procedure SE-OP-013 "Water Effluent Monitoring" before release was permitted.

If the critical receptor was the same group for all radionuclides potentially released by Nordion, the dose to public would be 0.00083 mSv. This value is a conservative over-estimate because the critical receptor has been used as the same receptor and because the DRLs are conservatively calculated.

Table 12
Liquid Releases (GBq/yr)

Year	Litres	Co-60	Nb-95	Zr-95	Cs-137
2020	747902	0.031	0.0015	0.0013	0.00076
2021	152762	0.0046	0.002	0.002	0.001
2022	101337	0.038	0.002	0.001	0.001
2023	142560	0.026	0.0005	0.0009	0.0006
2024	187185	0.0285	0.0009	0.0010	0.0006

Nordion SE-OP-013 (20) Constraints on each delay tank release (pH or GBq/Release)				
pH	**Co-60**	**Nb-95**	**Zr-95**	**Cs-137**
6-8.1	<0.0025	<0.0001	<0.00006	<0.00004

	Co-60	Nb-95	Zr-95	Cs-137

DRL (GBq/yr)	35.4	3,250	2,060	24.8
% DRL	8.04E-02	2.7E-05	4.8E-05	2.6E-03

2.9.1.3 Environmental TLDs

The approximate locations of environmental TLDs are listed in Table 13. The existing environmental TLD placement corresponds roughly to the historical locations of these dosimeters. The dosimeters are deployed to generally cover the points of a compass and preferentially to the east of the facility, which is the direction of the prevailing winds. The TLDs are also placed in residences of Nordion employees.

All environmental TLD readings for 2024 were well below the public limit of 1 mSv. The similarity in the recorded dose in these locations year over year, taken with the absence of any contamination found in soil illustrates that the variation between locations and between years is due to variations in natural background radiation at these different times and locations.

Table 13
Environmental TLDs Results

Location	2020 (mSv)	2021 (mSv)	2022 (mSv)	2023 (mSv)	2024 (mSv)
16 [redacted]	*	0.2	0.135	0.08	0.071
17 [redacted]	0.103	0.096	0.137	0.154	0.157
18 [redacted]	-0.092	0.04	0.358	0.159	0.339
19 [redacted]	-0.044	0.074	0.08	0.022	0.008
20 [redacted]	0.081	0.065	0.088	0.085	0.048
32 [redacted]	-0.04	-0.03	0.105	-0.001	-0.061
33 [redacted]	-0.083	-0.04	0.044	-0.038	-0.091
38 [redacted]	0.067	0.109	-0.053	-0.045	-0.040
57 [redacted]	-0.061	-0.037	0.07	-0.026	0.005
58 [redacted]	0.068	-0.048	0.084	0.098	0.095

* Missing TLD

2.9.2 Significance of Air and Water Release Monitoring Results

As in previous years, air releases remain several orders of magnitude lower than liquid effluent releases.

Nordion's releases remain well below the allowed DRL and do not present a negative impact to people or the environment.

2.9.3 Exceeding Regulatory Limits or Action Levels

There were no instances of exceeding CNSC environmental regulatory limits or action levels in 2024.

2.9.4 Spills to the Environment

There were no spills to the environment in 2024.

2.9.5 Environmental Protection Program Effectiveness

A review of the performance related to the Environmental Protection Program and the EMS is conducted on an annual basis. In 2024, this review was held during the Annual EHS Program Review in July 2024.

See Section 2.1.3 for a description of audits and inspections for 2024.

2.9.6 Environmental Protection Program Activities

Activities which took place in 2024 included the following:

- Conducting a total of ten fire and environmental inspections of the facility to identify areas for improvement and/or concerns,
- Conducting a supplier audit of a supplier whose goods/services could have a significant impact on the environment,
- Nordion was subject to an ISO 14001:2015 re-certification audit. One minor non-conformance and six opportunities for improvement were identified during this audit.

2.9.7 Environmental Protection Program Improvements

In 2024, Nordion made the following improvements to the Environmental Protection Program.

- Third party quality control assessment of groundwater and soil samples were conducted in 2024.

2.9.8 Environmental Protection Program Performance

A description of the 2024 Environmental Protection Program Initiatives is provided in Table 14, along with the results/outcomes.

A summary of initiatives and targets for 2025 is provided in Table 15.

Table 14
2024 Environmental Objectives and Targets

Objective	Target	Status
Conduct an audit of a supplier whose goods and/or services could have a significant impact on environmental, health and safety	Complete one supplier audit in accordance with SE-ENV-019 "Environment, Health and Safety Supplier Assessment Program" by the end of December 2024	Audit of a supplier whose goods and/or services can have a significant impact on environmental, health and safety were completed.
Investigate energy reduction opportunities	Estimated savings of 7,500 kWh per year	Complete, an estimated 99,000 kWh energy savings annually as a result of lighting retrofits.

Table 15
2025 Environmental Objectives and Targets

Objective	Target
Conduct an audit of a supplier whose goods and/or services could have a significant impact on environmental, health and safety	Complete one supplier audit in accordance with SE-ENV-019 "Environment, Health and Safety Supplier Assessment Program" by the end of December 2025
Investigate energy reduction opportunities	Estimated savings of 7,500 kWh per year

2.9.9 Groundwater and Soil Sampling and Monitoring

2.9.9.1 Soil Sampling

Soil samples were taken at 19 locations around the Nordion site in July 2024. Samples were analyzed as per Nordion's internal procedure on a Multi Channel Analysis (MCA). Background measurements (no sample, empty chamber) were also taken for reference but not subtracted from the measurements directly. The radioisotope primarily analyzed was Co-60. The Minimum Detectable Activity (MDA) is determined for each sample individually. When accounting for background Co-60 fields present in the facility, all 19 samples were determined to be less than the MDA. No radionuclides attributable to licensed activities were detected in the soil samples.

2.9.9.2 Groundwater Sampling

2.9.9.2.1 Non-Radiological Sampling

Non-radiological groundwater samples were taken in June 2024. See details in Appendix C.

The results of this analysis demonstrated that there were no significant changes to groundwater when compared to previous years. This indicates that Nordion's operations have not had a significant impact on the groundwater.

2.9.9.2.2 Radiological Sampling

Nordion monitors groundwater at least once a year.

Samples were taken in July 2024 from the following boreholes (BH) to assess potential radiological contaminants:

- 1991-BH1
- 1991-BH2
- 1991-BH3
- 1991-BH4
- 2012-BH1

Samples were analyzed as per Nordion's internal procedure on a MCA. The radioisotope primarily analyzed was Co-60. The MDA was determined for each sample individually to be 1.1 Bq. When accounting for background Co-60 fields present in the facility, all five samples were determined to be less than the MDA. No radionuclides attributable to licensed activities were detected in the water samples.

2.10 Emergency Management (EM) and Fire Protection

2.10.1 Emergency Preparedness Program Effectiveness

Management has assessed the existing program and deemed it effective through historical success in meeting the response objectives during exercises.

Nordion completed all its scheduled activities for 2024.

2.10.2 Emergency Preparedness Program Activities

Nordion has an extensive emergency preparedness program to respond to various types of emergency situations, including on-site and off-site emergencies. During 2024, a number of Emergency Response exercises were conducted to test these emergency response plans and response personnel.

The following activities took place in 2024:

- Completed a joint exercise between Nordion Security and Ottawa Police Tactical Unit (EM/Security), including debrief and plans to conduct future exercises.
- Testing of the Fire Safety Plan in each of the KOB, RE Building and Heating Plant, including alarm activation and full evacuation.
- Conducted a transportation emergency tabletop exercise with key stakeholders and EM personnel.
- Conducted a tabletop exercise for response to an industrial irradiator emergency with key stakeholders and EM personnel.
- Completed annual Emergency Response Contact List exercise
- Onboarding several new employees to Incident Management System (IMS) positions, support groups and Emergency Response Program (ERP) roles.
- Continued to provide ongoing training and walkthroughs for ERP personnel.

2.10.3 Emergency Preparedness Program Performance

The emergency preparedness program performance was tested during the exercises and drills noted in the previous section. During these exercises and drills, Nordion executed an effective response and demonstrated good interoperability with local first responders.

Overall compliance with the EM Program was proven satisfactory. There were no events (planned or actual) demonstrating non-compliance with the EM Program.

2.10.4 Emergency Preparedness Program Improvements

In 2024, Nordion completed program enhancements to address minor areas for improvement identified in exercises and drills and other continuous improvements. As noted above, these included:

- Onboarding new staff
- Continued training with all IMS, IMS positions and subplan support groups
- Equipment upgrades

2.10.5 Fire Protection Program Effectiveness

Fire exercises/evacuations were conducted in the Heating Plant, the RE Building and the KOB in 2024. There were no significant findings identified as a result of these exercises.

The objective of the fire protection program is to promote life safety, the conservation of property and essential equipment, the protection of the environment and the continuity of operations through provisions of fire prevention and fire protection measures. Nordion met all scheduled activities related to the fire protection program in 2024. An annual facility condition inspection was conducted by a third party in 2024.

2.10.6 Fire Protection Program Activities

The Fire Protection Program Activities that took place in 2024 include:

- Testing of the fire safety plans. This test involved evacuation of the Heating Plant and RE buildings by activation of the building fire alarm system, and a test of the KOB fire

safety plan and emergency response plan which included participation with Ottawa Fire Services.
- Conducting ten fire and environmental inspections
- Conducting an annual facility condition inspection

A fire protection program audit was conducted in 2022 and is conducted every three years as required by Canadian Standards Association (CSA) standard N393, “Fire protection for facilities that process, handle, or store nuclear substances”.

2.10.7 Fire Protection Program Performance

Overall, compliance with the Fire Protection Program was satisfactory.

2.10.8 Fire Protection Program Improvements

Improvements to the Fire Protection Program in 2024 included:

- Completion of actions from 2023 gap analysis against CSA N393-22, NBCC 2020 and NFCC 2020.

There were no changes to training, methods, instrumentation, or equipment in 2024.

2.11 Waste Management

2.11.1 Effectiveness of Waste Segregation and Minimization

Nordion production facilities have been designed and operated in a manner to prevent radioactive waste being released to municipal garbage or sewer systems and to ensure that releases to the environment via air or water emissions are within limits approved by the CNSC. All radioactive waste that is generated through the production operations is collected and sent to a CNSC approved radioactive waste management facility.

Nordion has designated space and processes to store and separate radioactive waste that is generated in Operations Space is also designated for storage of containers and management of waste being prepared for shipment to the external waste management facilities.

Nordion’s non-radiological waste diversion rate in 2024 was 64.3%, up slightly from 62% in 2023.

2.11.2 Identification and Characterization of Waste Streams

Due to the nature of radioisotope production that involves decay and contamination products, identification of individual isotopes and their respective quantities in waste material is difficult. Nordion has worked with a radioactive waste management facility to identify waste streams that are determined by the major isotope product in a given facility. Data for the actual waste activity levels are estimated from activity in the production volume and waste streams.

2.11.3 Waste Shipments

Table 16 provides a summary of solid waste material shipped to [redacted]. In 2024, there were no shipments to [redacted] of radioactive liquid waste from Nordion’s Class 1B Facility.

Table 17 provides a summary of solid waste, shipped to [redacted] in 2024. Solid waste sent to [redacted] is not compacted, as compacted wastes are unfavourable for this disposal route, and the waste volumes shown in Table 17 represent uncompacted waste volumes.

Spent Co-60 sealed sources may be returned to Nordion from customers where [redacted] or included with other product material for disposal. In 2024, 1 low activity source was disposed at [redacted] in routine waste shipments (included in the values shown in Table 16).

Table 16
Radioactive Solid Waste Shipments to [redacted] for 2024

Isotope	Volume (m^3)	Bq	Ci
Co-60	[redacted]	[redacted]	[redacted]

Table 17
Radioactive Solid and Low-level Liquid Waste Shipments to [redacted] for 2024

Isotope	Weight (kg)	Volume (m^3)	Bq	Ci
Co-60	[redacted]	[redacted]	[redacted]	[redacted]

2.11.4 Waste Management Program Performance

- Nordion diverted an estimated 64.3% of non-hazardous waste from landfill in 2024.

The waste management program was audited in late 2024 and is on a three-year frequency for internal auditing. Nordion has an annual waste audit conducted by a third party (non-hazardous waste only).

2.11.5 Waste Management Program Improvements

Improvements to the Waste Management Program in 2024 included the following:

- No sealed sources were shipped to [redacted] for disposal [redacted]

2.12 Nuclear Security

Details of Nordion security and any security improvements of 2024 were provided in the Nordion Physical Security Report and Security Plan for 2024, submitted in February 2024. These safeguards and improvements are prescribed information and were reviewed and accepted by CNSC Security.

2.13 Safeguards and Non-proliferation

2.13.1 Safeguards Program Effectiveness

Nordion has a safeguards program that meets the safeguards requirements of the CNSC regulatory document REGDOC-2.13.1-Safeguards and Nuclear Material Accountancy, CNSC *Nuclear Non-Proliferation Import and Export Control Regulations*, the *Nuclear Safety and Control Act* and *General Nuclear Safety and Control Regulations*.

2.13.2 Safeguards Program Performance

In 2024, Nordion performed accounting and reporting of nuclear material as required by REGDOC-2.13.1-Safeguards and Nuclear Material Accountancy. Nordion completed a Physical Inventory Taking of safeguarded material from which there were no findings.

Nordion was selected for an IAEA PIV in 2024. The IAEA were satisfied with the inspection and all material was accounted for.

There was no IAEA Complementary Access conducted at Nordion in 2024.

2.13.3 Safeguards Program Improvements

The request to exempt the final depleted Uranium transport package model 3300 remains outstanding since January 2022.

2.14 Packaging and Transport of Nuclear Substances

Nordion routinely ships nuclear substances and radioactive waste materials in Type B, Type A and Excepted packages. Shipments of Nordion's products are made via road, air, and sea. Shipments of waste are routinely made via road transport.

In 2024, Nordion shipped approximately [redacted] shipments of radioactive material.

The Packaging and Transportation Program at Nordion provides a high-level overview of Nordion's transportation of radioactive materials program. The program applies to employees involved in design, production, use, inspection, maintenance and repair of packages, and the preparation, consigning, handling, loading, carriage, storage during transport, receipt at final destination, and unloading of packages. It applies to various types of packages including Type A, Type B, and Excepted packages. The content of the program was modeled on regulatory requirements listed in the CNSC *Packaging and Transportation of Nuclear Substances Regulations 2015 (PTNSR)*, Transport Canada *Transportation of Dangerous Goods Regulations (TDG)*, IAEA *SSR-6 Regulations for the Safe Transport of Radioactive Material (2018 Edition)*, US DOT 49 CFR, and US NRC 10 CFR part 71.

In 2024, Nordion reported three events related to packaging and transport of nuclear substances. The first event related to shipment of an unapproved source model in a Type B package. This was reported as a non-compliance with section 26 of the PTNSR. The other two events were provided as a carrier perspective for damaged packages originally reported by BWXT Medical.

2.15 Indigenous Engagement

The Nordion facility is situated in the unceded territories of the Algonquin Anishinaabe. There are several Indigenous Nations and groups that would have an interest in Nordion activities. Primarily, these are:

- The Algonquins of Pikwakanagan First Nation (AOPFN);
- The Kebaowek First Nation; and
- The Algonquins of Ontario (AOO).

Nordion is committed to engagement with Indigenous Nations.

In May 2024, Nordion began discussions with the AOPFN on an engagement plan. Those discussions continue in 2025 and Nordion is working with the AOPFN to host an in-person discussion on Nordion's licence submission within the AOPFN community.

In August 2024, Nordion submitted formal notices of submission of our licence renewal application to the AOPFN, Kebaowek First Nation, AOO, the Metis Nation of Ontario, and the Kitigan Zibi Anishinabeg. The AOO reached out for further information. Introductory calls between Nordion and the AOO were held in August 2024.

2.16 Public Information Program

2.16.1 Public Information Program Activities

Nordion is committed to fully disclosing its activities to the public to maintain transparency to the surrounding community and to the City of Ottawa. Nordion's website is the primary communications vehicle.

In 2024, Nordion published the following information in the "Public Disclosure" web page:

- April: The Ottawa Fire Services was at Nordion for a planned meeting to better understand Nordion's operations.
- May:

  - The Ottawa Fire Services was dispatched to Nordion after receiving a call in error from the third-party monitoring company.
  - Nordion hosted the Ottawa Police Services for a special training exercise.
  - The Independent Environmental assessment from samples collected in 2023 were released.
- June: Nordion evacuated the facility as part of an emergency response exercise with the Ottawa Fire Services Personnel.
- September: There was a minor impairment of Nordion's Fire System due to water main replacement.
- December: Ambulance was on-site for one of Nordion's employees who was having personal medical issues.
- Q1, Q2, Q3, and Q4: 2024 Event reports.

Nordion's website includes a feedback survey form in the Social Responsibility section as a mechanism to invite the public to provide feedback on Nordion's Public Information Program and to learn how the public would like the program to evolve. In 2024, there were no questions pertaining to Nordion's public information program received through the general contact form.

Nordion issues news releases to inform the public of company initiatives, achievements, and issues that the business may be facing. In 2024, there were no media articles related to Nordion environment, health and safety issues or topics. As the context of media coverage referring to Nordion was business-oriented, there was no media analysis of public opinion.

As part of our licensing renewal efforts, Nordion engaged with the local community to inform them of the renewal application and process and address any questions or concerns that are brought forward. A copy of the renewal application was posted on the Nordion website.

In October 2024, Nordion held a public outreach event at a venue in Kanata, across from the Nordion facility. Prior to the event, mailers were sent to the surrounding community, notifying the community of the Nordion renewal application for a 25-year licence and inviting the community to the outreach event. A handful of the public attended the event. Nordion provided an overview of products and safety programs, followed by a Q&A session. Based on the Q&A and subsequent discussions, the following main points were identified from the event:

- Members of the community understood how important Nordion's products are to the healthcare sector; and
- The community was generally receptive to a 25-year licence.

In November 2024, Nordion conducted its bi-annual telephone survey of the surrounding area. The survey was conducted by Nanos Research and generally followed the same questions asked in previous surveys, with an additional question on the public's reactions to Nordion's request for a 25-year renewal. A total of 500 residents were surveyed. The results determined that Nordion's overall favourability remained high among residents. With respect to the 25-year licence renewal, 51.1% had no view on the renewal, 29.5% were in favor, and only 0.5% felt that 25-years was too long. The remaining 18.9% were unsure, would like additional information, or felt it would depend on the safety and environmental impact.

In December 2024, Nordion published an ad in the *Community Voice*, a bi-weekly newspaper distributed to 85,000 homes and businesses across Ottawa and the surrounding areas. The ad underlined Nordion's ongoing commitment to protect the safety of employees, the community and the environment, referred to the Kanata facility as a Class 1B nuclear facility, noted that Nordion is certified to ISO 14001, an international standard for environmental management systems; and encouraged the public to contact Nordion with any questions, comments, or concerns.

2.16.2 Public Information Program Improvements

There were no significant changes to the Public Information Program in 2024. The Public Information Program remains effective.

2.17 Financial Guarantee

The Financial Guarantee, as approved by the Commission and based on the Facility's Decommissioning Plan, remains valid and in effect.

2.18 Site Specific Information

Nordion's site-specific reporting requirements are as follows:

- Nordion shall submit a written notification of changes to the facility or its operation, including deviation from design, operating conditions, policies, programs, and methods, referred to in the licensing basis,
- Nordion shall, when aware that an action level has been reached, notify the Commission within seven days,
- Nordion shall prepare and submit to the Commission an Annual Compliance Report by March 31st of each year,
- Nordion shall report the transfer, receipt, export or import of sealed sources if the activity exceeds the threshold limits and within the specified timeframes as detailed in the LCH,
- Nordion shall report annually to the CNSC on the status of the financial guarantee, to inform that it remains valid, in effect and adequate to fund decommissioning of the facility.

In 2024, Nordion submitted written notification of changes to programs and documents to the CNSC as required.

In 2024, there was one exceedance of an action level. An employee's dosimetry indicated a dose of 2.85 mSv during a quarter, exceeding the Nordion Action level of 2 mSv. Upon investigation, it was confirmed that this dose was the result of the dosimetry badge being sent through an airport x-ray security scanner and was not a personnel dose. This is described in Section 2.7.1.

Nordion submitted its 2023 Annual Compliance Report to the CNSC in March 2024, as required.

Nordion complied with all other site-specific reporting requirements. Throughout 2024, the Nordion decommissioning financial guarantee remained effective and compliant with CNSC requirements.

3 FUTURE PLANS AND CONCLUDING REMARKS

3.1 Improvement Plans and Future Outlook

The forecasted plans for next year that would require CNSC regulatory oversight are as follows:

- Commission Hearing on Nordion Operating licence renewal

3.2 Safety Performance Objectives for 2025

Nordion's 2025 EHS Program Objectives and Targets and Health and Safety Objectives are shown in Table 18.

3.3 Concluding Remarks

Based on the information provided in this report, Nordion continues to demonstrate its capacity to operate in a manner that protects the safety of employees and causes no adverse effects to the public or the environment.

Table 18
2025 EHS Program Objectives and Targets

Objective	Measure/Target *
Timely CAPA Closure	• Ensure timely closure of CAPAs (100% completion to target date) • No overdue compliance action items
EHS Management System Effectiveness	• Ensure timely closure of CAPAs (100% completion to target date) • No overdue compliance action items • No EHS critical training overdue (0)
Minimize the number and extent of occupational injuries	• Number of Medical Treatment Incidents = 0 • Lost time Incidents = 0
Minimize the use and release of hazardous materials to the environment and ensure adherence to permissible levels	• Radioactive materials emissions to < 2.0% of the Derived Release Limits (DRL) (Ottawa). • No (0) reportable releases of radioactive and non-radioactive hazardous materials to the environment (sanitary or storm sewer, air, groundwater, land)
Actively limit radiation doses to employees as per ALARA principle	• Maximum employee dose rate < 6.5 mSv/yr
Maintain a healthy safety culture. *	• Actively participate in the behavioural based safety culture program (Sotera Health Culture Program, safety discussions and training as applicable) • Immediately report, and where possible, take appropriate corrective action on near-misses and hazard identifications o Target: 30 safety walkthroughs over the year • IMMEDIATELY REPORT (within the same shift) work related injuries and suspected ergonomic symptoms (early onset pain) to your Manager

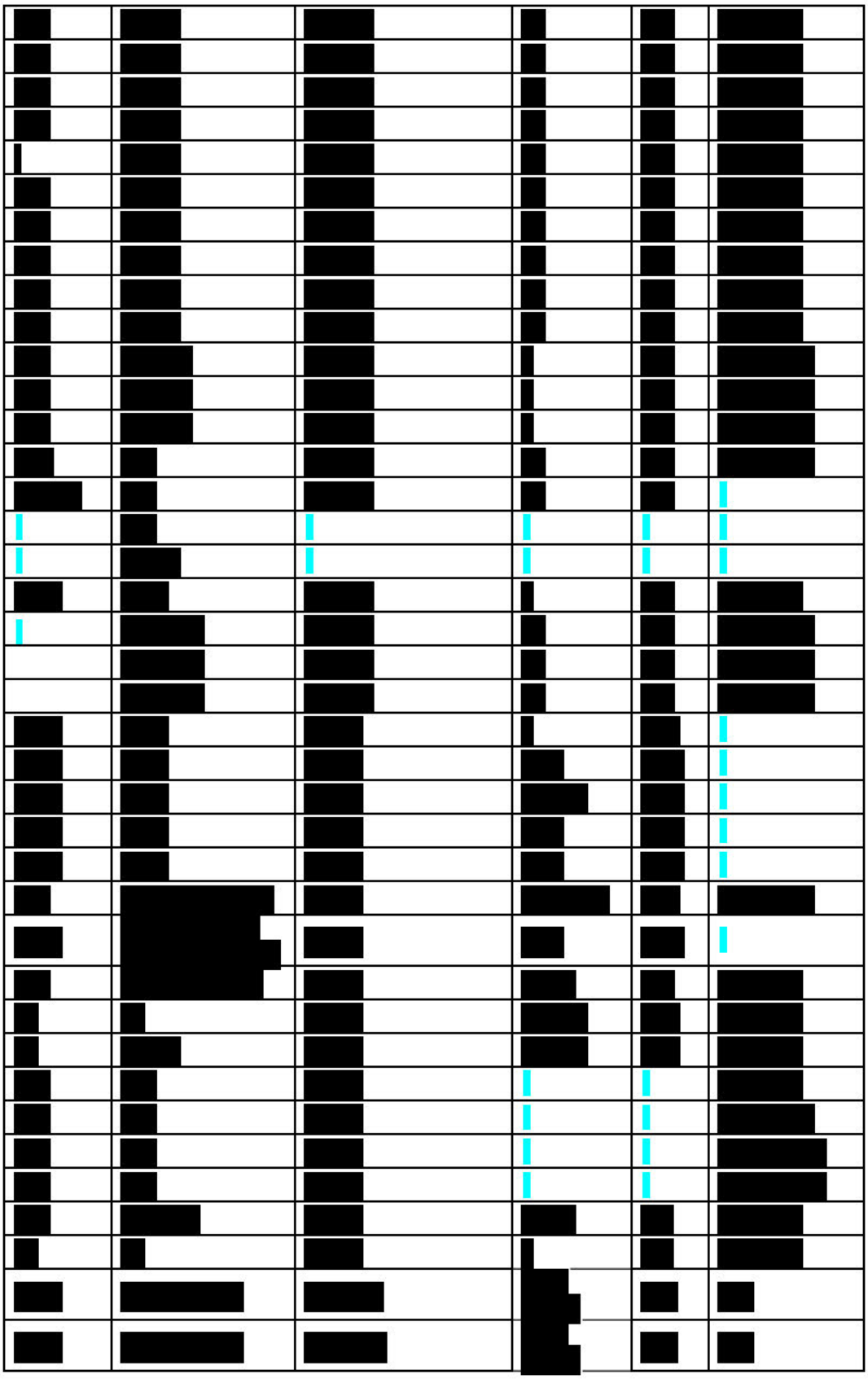
***** Note: Some Health and Safety Targets have been established to promote safety culture only and are therefore not measurable.

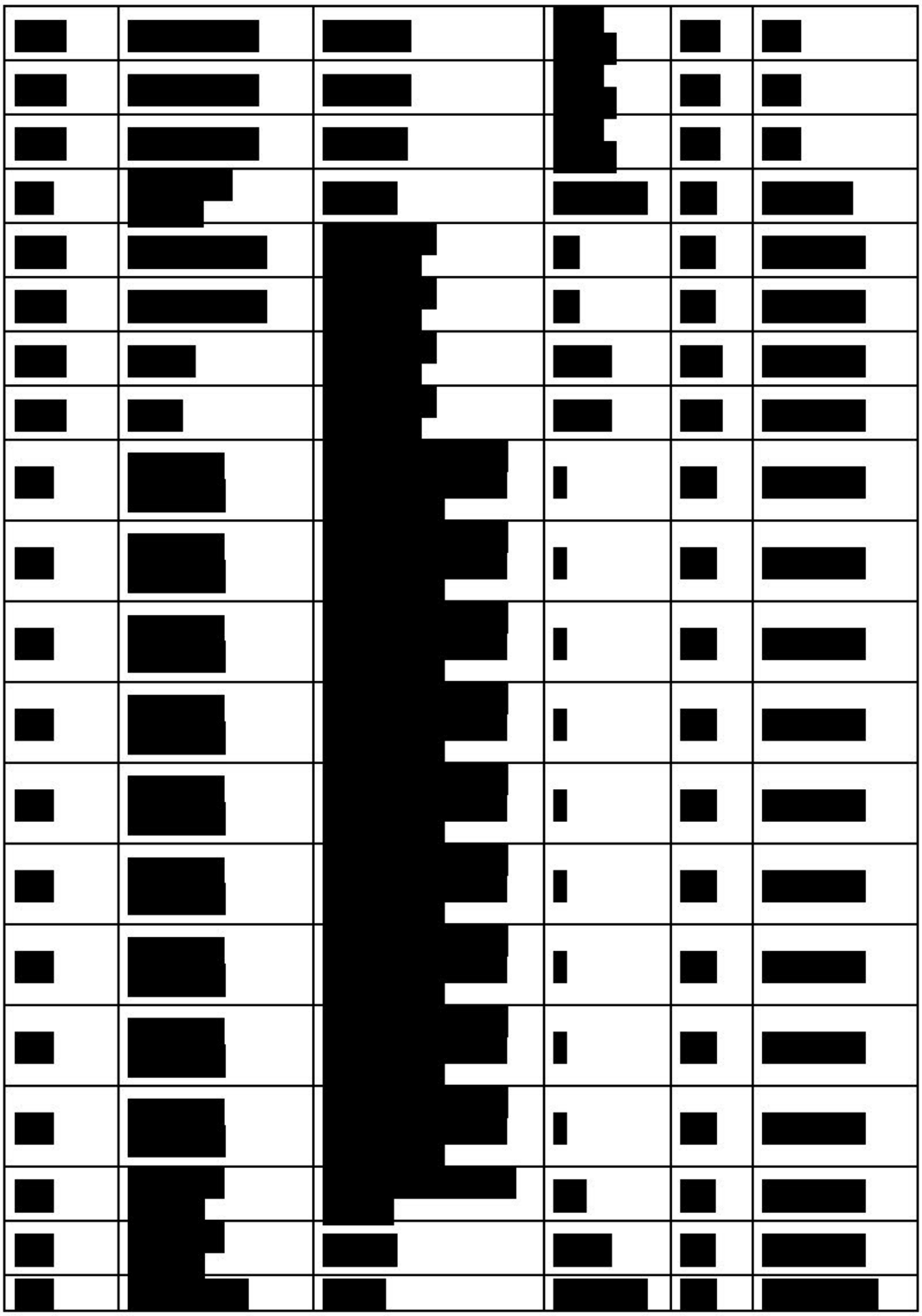
APPENDIX A
2024 Reportable Events

Date of Occurrence	Incident No.	Description	Causes	Corrective Actions
May 9, 2024	IN-20240507-004	Upon reviewing the dosimetry report, it was discovered that an employee's TLD dose exceeded Nordion's internal action level.	An investigation identified that this was not a true employee dose but was the result of the TLD being sent through an airport x-ray scanner.	To mitigate future reoccurrence, a sign was posted on the dosimeter drop box to remind employees to properly report any potentially defective employee dosimeters, including those that may have gone through an airport x-ray scanner.
August 29, 2024 and December 17, 2024	IN-20240829-004 and IN-20241217-003	Nordion delivered a number of Type A transport packages to an air carrier as a carrier for another licensee. Each package consisted of a single patient dose of a medical isotope. Several of the packages were damaged by the subsequent air carriers.	The air carrier damaged one of the packages during handling. The damage was minor and did not impact the safety integrity of the package.	Nordion returned the damaged package to the original consignor for safe and proper disposition. The air carrier has provided additional guidance on package handling to mitigate future damage.
September 13, 2024	IN-20240913-005	It was identified that Nordion made a shipment of a non-Nordion model sealed sources in a Type B transport package that is only authorized to transport the Nordion C-188 sealed source type. The transported sealed source was identical to the C-188 in form, fit, and function.	The error arose from improperly completed documentation. There was no impact to safety as the sources shipped were similar to the allowed contents in form, fit, and function.	Additional documentation verification has been implemented to prevent reoccurrence.
November 4, 2024	IN-20241103-001	OFS on site due to time change panel notice on the alarm panel.	Poor communications and inadequate software upgrade process.	Panel software updated. Communication protocol revised.

Appendix B
Non-Production Sealed and Unsealed Source Inventory

Unique ID	Serial #	Isotope	Activity	Unit	Activity Reference Date (M/D/Y)
[redacted]					





Nordion Depleted Uranium Transport Containers

SN	Activity (GBq)	SN	Activity (GBq)
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]

Appendix C
Groundwater Sampling (Non-radiological)

Borehole #1 (2005-BH1)

		Sample Date:	2024-12-06	2023-06-21	2022-06-08	2021-09-29	2020-10-05	2005-04-07 (initial Sample)
		Sample ID:	**2005-BH1**	**2005-BH1**	**2005-BH1**	**2005-BH1**	**2005-BH1**	**2005-BH1**
Parameter	**UNITS**	**MDL**						
Alkalinity as CaCO3	mg/L	5	407	407	488	475	433	278
Biochemical Oxygen Demand	mg/L	1	<3	<3	<3	<3	< 3	<1
Chemical Oxygen Demand	mg/L	5	5	5	12	11	< 5	7
Chloride (Cl)	mg/L	1	10.7	10.7	52	79.5	75	40
Conductivity	µS/cm	5	778	778	1110	1100	1120	676
Dissolved Organic Carbon	mg/L	0.5	1.2	1.2	3.1	3.5	3.1	1.6
N-NH3 (Ammonia)	mg/L	0.02	<0.05	<0.05	0.03	0.19	0.14	0.02
N-NO3 (Nitrate)	mg/L	0.1	0.09	0.09	<0.05	<0.05	< 0.05	0.53
pH			7.93	7.93	7.89	8.02	7.96	7.71
Sulphate (SO4)	mg/L	1	16	16	73	51	51	22
TDS (COND - CALC)	mg/L	5	408	408	660	652	676	439
Total Suspended Solids	mg/L	2	132	132	456	1240 *	570	1390
Calcium (Ca)	mg/L	1	89.4	89.4	113	113	150	80
Magnesium (Mg)	mg/L	1	30.9	30.9	50.5	53.1	63.7	29
Sodium (Na)	mg/L	2	55.1	55.1	69.6	58.2	59.6	18
Barium (Ba)	mg/L	0.01	0.09	0.09	0.122	0.146	0.217	0.02
Boron (B)	mg/L	0.01	0.031	0.031	0.047	0.086	0.086	0.07
Iron (Fe)	mg/L	0.03	1.27	1.27	<0.005	<0.005	3.13	<0.01
PHC F1 (C6-C10)	mg/L	0.2	<0.025	<0.025	<0.025	<0.025	<0.05	<0.2
PHC F2 (C10-C16)	mg/L	0.2	<0.050	<0.050	<0.050	<0.050	<0.05	<0.2
PHC F3 (C16-C34)	mg/L	0.5	< 0.4	< 0.4	< 0.4	< 0.4	<0.4	<0.2
PHC F4 (C34-C50)	mg/L	0.5	< 0.4	< 0.4	< 0.4	< 0.4	<0.4	<0.2

* TSS were found to be high in BH 2005-BH1 in 2021. A third party was brought in to assess and conduct additional purging of the well. Additional samples were taken on 2021/11/02 and 2021/12/20 which brought levels down to 4 mg/L.

Borehole #2 (2005-BH2)
(Background Well)

			Sample Date:	6/12/2024	6/21/2023	2022-06-08	2021-09-29	2020-10-05	2005-04-07 (initial Sample)
			Sample ID:	**2005-BH2**	**2005-BH2**	**2005-BH2**	**2005-BH2**	**2005-BH2**	**2005-BH2**
Parameter	**UNITS**	**MDL**							
Alkalinity as CaCO3	mg/L	5		317	328	323	325	286	278
Biochemical Oxygen Demand	mg/L	1		3	<3	<3	<3	<3	<1
Chemical Oxygen Demand	mg/L	5		13	8	<5	9	<5	7
Chloride (Cl)	mg/L	1		167	158	142	161	166	40
Conductivity	µS/cm	5		1170	1130	1060	1070	1100	676
Dissolved Organic Carbon	mg/L	0.5		1.9	<0.2	1.3	1.8	0.8	1.6
N-NH3 (Ammonia)	mg/L	0.02		<0.05	<0.05	<0.01	0.02	0.020	0.02
N-NO3 (Nitrate)	mg/L	0.1		0.120	0.83	0.860	0	< 0.05	0.53
pH				7.73	7.87	8.02	7.88	8.07	7.71
Sulphate (SO4)	mg/L	1		29	28	26	27	26	22
TDS (COND - CALC)	mg/L	5		628	608	572	599	599	439
Total Suspended Solids	mg/L	2		41	250	33	37	620	1390
Calcium (Ca)	mg/L	1		113	115	109	117	130	80
Magnesium (Mg)	mg/L	1		40	41.6	40	40	46	29
Sodium (Na)	mg/L	2		63	56.3	56	53	50	18
Barium (Ba)	mg/L	0.01		0.03	0.053	0.02	0.024	0.05	0.02
Boron (B)	mg/L	0.01		0.02	0.023	0.02	0.02	0.03	0.07
Iron (Fe)	mg/L	0.03		0.26	2.77	<0.005	0.18	1.45	<0.01
PHC F1 (C6-C10)	mg/L	0.2		<0.025	<0.025	<0.02	<0.02	<0.05	<0.2
PHC F2 (C10-C16)	mg/L	0.2		<0.050	<0.050	<0.05	<0.05	<0.05	<0.2
PHC F3 (C16-C34)	mg/L	0.5		< 0.4	< 0.4	<0.4	<0.4	<0.4	<0.2
PHC F4 (C34-C50)	mg/L	0.5		< 0.4	< 0.4	<0.4	<0.4	<0.4	<0.2

Borehole #3 (2005-BH3)

			Sample Date:	6/12/2024	6/21/2023	2022-06-08	2021-09-29	020-10-05	2005-04-07 (initial Sample)
			Sample ID:	**2005-BH3**	**2005-BH3**	**2005-BH3**	**2005-BH3**	**2005-BH3**	**2005-BH3**
Parameter	**UNITS**	**MDL**							
Alkalinity as CaCO3	mg/L	5		438	468	459	468	420	471
Biochemical Oxygen Demand	mg/L	1		<3	<3	<3	<3	<3	<1
Chemical Oxygen Demand	mg/L	5		21	6	6	<5	<5	10
Chloride (Cl)	mg/L	1		69	67.1	66	76	62	64
Conductivity	µS/cm	5		1090	1110	1080	1100	1080	1170
Dissolved Organic Carbon	mg/L	0.5		2.3	0.9	2.5	3.1	1.9	3.3
N-NH3 (Ammonia)	mg/L	0.02		<0.05	<0.05	0.01	0.09	0.06	0.09
N-NO3 (Nitrate)	mg/L	0.1		<0.05	0.22	0.41	0.14	0.08	<0.10
pH				7.99	8.1	8.05	8.03	8.08	7.49
Sulphate (SO4)	mg/L	1		54	57	56	63	61	81
TDS (COND - CALC)	mg/L	5		585	594	634	667	620	761
Total Suspended Solids	mg/L	2		61	83	94	59	75	496
Calcium (Ca)	mg/L	1		95	93.8	101	110	105	121
Magnesium (Mg)	mg/L	1		45	44.5	47	47	47	51
Sodium (Na)	mg/L	2		81	80.5	80	80	81.6	63
Barium (Ba)	mg/L	0.01		0.07	0.075	0.06	0.08	0.0820	0.06
Boron (B)	mg/L	0.01		0.25	0.257	0.22	0.25	0.2650	0.14
Iron (Fe)	mg/L	0.03		0.245	0.577	<0.005	0.243	0.402	<0.01
PHC F1 (C6-C10)	mg/L	0.2		<0.025	<0.025	<0.02	<0.02	<0.05	<0.2
PHC F2 (C10-C16)	mg/L	0.2		<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
PHC F3 (C16-C34)	mg/L	0.5		<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
PHC F4 (C34-C50)	mg/L	0.5		<0.4	<0.4	<0.4	<0.4	<0.4	<0.2

Borehole #4 (2005-BH4)

Sample Date:			6/12/2024	6/21/2023	2022-06-08	2021-09-29	2020-10-05	2005-04-07 (initial Sample)
Sample ID:			**2005-BH4**	**2005-BH4**	**2005-BH4**	**2005-BH4**	**2005-BH4**	**2005-BH4**
Parameter	**UNITS**	**MDL**						
Alkalinity as CaCO3	mg/L	5	270	293	276	265	237	279
Biochemical Oxygen Demand	mg/L	1	<3	<3	<3	<3	< 3	<1
Chemical Oxygen Demand	mg/L	5	18	<5	<5	<5	8	6
Chloride (Cl)	mg/L	1	34	32.2	30	35	22	15
Conductivity	µS/cm	5	707	716	682	681	625	646
Dissolved Organic Carbon	mg/L	0.5	2.8	1.8	2.1	3.4	3.3	2.1
N-NH3 (Ammonia)	mg/L	0.02	0.13	0.15	0.11	0.11	0.13	0.17
N-NO3 (Nitrate)	mg/L	0.1	<0.05	0.09	<0.05	<0.05	< 0.05	<0.10
pH			7.80	8.09	8.00	7.90	8.07	7.84
Sulphate (SO4)	mg/L	1	51	51	46	62	48	41
TDS (COND - CALC)	mg/L	5	367	372	393	409	353	420
Total Suspended Solids	mg/L	2	4	5	3	<3	6	175
Calcium (Ca)	mg/L	1	49	47.8	50	62	51	39
Magnesium (Mg)	mg/L	1	19	19.8	21	22	20	18
Sodium (Na)	mg/L	2	77.6	74.8	73	60	61	76
Barium (Ba)	mg/L	0.01	0.083	0.085	0.08	0.10	0.08	0.07
Boron (B)	mg/L	0.01	0.239	0.221	0.194	0.189	0.187	0.19
Iron (Fe)	mg/L	0.03	0.389	0.738	0.006	0.544	0.513	0.16
PHC F1 (C6-C10)	mg/L	0.2	<0.025	<0.025	<0.02	<0.02	<0.05	<0.2
PHC F2 (C10-C16)	mg/L	0.2	<0.05	<0.05	<0.05	<0.05	<0.05	<0.2
PHC F3 (C16-C34)	mg/L	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
PHC F4 (C34-C50)	mg/L	0.5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2