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Algonquins of Ontario	

Mémoire des Algonquins de l'Ontario

In the Matter of the

À l'égard de

SRB Technologies (Canada) Inc.

SRB Technologies (Canada) Inc.

Application for the renewal of the licence for SRBT Facility

Demande de renouvellement de permis pour l'installation de SRBT

**Commission Public Hearing** 

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# Technical Review of SRB Technologies (Canada) Inc. Application for Class IB Nuclear Substance Processing Facility Operating Licence



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**Algonquins of Ontario Consultation Office** 

31 Riverside Drive, Suite 101 Pembroke, ON K8A 8R6 **Phone:** 1-855-735-3759

Fax: 613-735-6307

Email: algonquins@tanakiwin.com

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### 1.0 Executive Summary

SRB Technologies (Canada) Inc. (SRBT, the Proponent) has applied to the Canadian Nuclear Safety Commission (CNSC) for a Class IB nuclear substance processing facility licence. If granted, the licence would allow SRBT to continue operating a tritium processing facility on the outskirts of Pembroke, Ontario, for the purposes of manufacturing radiation devices. The facility is a leased space located within an industrial building, which has been in operation since 1990 and is currently operated by SRBT. The current licence being sought by SRBT is intended to cover a period of 15 years, commencing on July 1, 2022 and ending on June 30, 2037.

SRBT intends on continuing to use the tritium processing facility to produce gaseous tritium light sources and radiation devices containing the gaseous tritium light sources, such as self-luminous safety signs and devices. SRBT has indicated in their license application that the requested activities outlined in the application are the same as those currently permitted under their existing license.

SRBT has demonstrated in their licence application that the effective doses of radiation to both nuclear energy workers and the public are very low and within the acceptable limits. Also, SRBT noted that during their current seven-year license term, there have been no radiation doses that have met levels triggering action by SRBT. As well, SRBT's 2017 Safety Analysis Report noted that even under a worst-case incident, workers and members of the public affected are not expected to exceed the effective dose limits outlined in Canada's *Radiation Protection Regulations*.

In 2020, SRBT conducted an Environmental Risk Assessment (ERA), which included participation of community members from Algonquins of Pikwakanagan First Nation in sampling activities. The ERA was accepted by CNSC in 2021, and it showed that terrestrial and aquatic receptors remain protected from radiological releases from SRBT as well as from physical stressors associated with the facility.

In their license application, SRBT stated they have conducted outreach activities with local Indigenous communities to provide information, including about their company, to help foster and sustain meaningful long-term relationships. SRBT also mentioned in their license renewal application that they are a member of the Canadian Council for Aboriginal Business (CCAB).

SRBT has further outlined that they intend to continue building relationships with Indigenous communities near the facility, and that these relationships could help to inform operational improvements and reduction in environmental impacts.

As the AOO did not identify any significant environmental or human health concerns during our review of SRBT's licence application, no issues or concerns have been identified by the AOO.



### 2.0 Introduction

### 2.1 Project Description and Regulatory Process

In June 2021, SRB Technologies (Canada) Inc. (SRBT, the Proponent) applied to the Canadian Nuclear Safety Commission (CNSC) for the renewal of a Class IB Nuclear Substance Processing Facility Operating License. The current license was issued by the CNSC in 2015 for a period of seven years and is set to expire on June 30, 2022. The licence renewal application would allow for SRBT to continue to operate a tritium processing facility located on the outskirts of Pembroke, Ontario. The proposed facility is located within the existing nuclear substance processing facility which has been operated by SRBT since 1990 under licenses issued by the CNSC and its predecessor, the Atomic Energy Control Board. The licence being sought by SRBT is intended to cover a period of 15 years, commencing on July 1, 2022, and ending on June 30, 2037.

SRBT intends on using the tritium processing facility to produce gaseous tritium light sources and radiation devices containing gaseous tritium light sources, such as self-luminous safety signs and devices. Tritium is a radioactive isotope of hydrogen that can occur naturally in the environment, emitting a low-energy beta particle as it decays into Helium-3. It can also be produced artificially as a byproduct of nuclear reactors and power generation and converted into tritium gas. The captured gas from these processes, which is stored as a metal tritide, is sourced by SRBT for tritium processing. The technology used for processing was developed in the United Kingdom by the precursor of SRBT.

The Proponent has indicated in their licence renewal application that if they are granted the Class IB licence, they intend to use the same systems and procedures that were authorized during their most recent license period. In 2020, SRBT completed an Environmental Risk Assessment (ERA) in accordance with CSA Standard N288. 6-12, for which a report was published. The recommendations outlined in the ERA report will be incorporated into SRBT's Environmental Management System throughout the next four years. Also in 2020, the CNSC reported on the oversight and compliance performance of the SRBT facility through the annual Regulatory Oversight Reports for Uranium and Nuclear Substance Processing Facilities and Research Reactors, which concluded that the SRBT facility operated safely that year.

CNSC will be holding a public hearing on April 13-14, 2022, to consider the application from SRBT for the renewal of a Class IB Nuclear Substance Processing Facility Operating License. CNSC staff have reviewed the licence renewal application based on the regulatory and technical requirements outlined in the Class I Nuclear Facilities Regulations, the General Nuclear Safety and Control Regulations, and the Nuclear Safety and Control Act. As well, CNSC staff used the facility's ERA, Annual Compliance Monitoring Reports, and the Preliminary Decommissioning Plan to inform their review of the license application. The results of the CNSC staff review and assessment will be considered at the Commission Public Hearing being held on April 13-14, 2022.

### 2.2 Review Scope and Objectives

The nuclear substance processing facility where SRBT is requesting to continue to operate a tritium processing facility is located within the unceded AOO Settlement Area, over which unextinguished



Aboriginal Rights and title are asserted. As such, the CNSC has provided participant funding to support the AOO's participation in the licence application review and Commission hearing process for SRBT's licence application.

Shared Value Solutions Ltd. has been retained by the AOO to review SRBT's licence application and identify potential impacts to the AOO's Aboriginal [section 35] Rights. The scope of SVS' review focused on identifying any environmental, human health, or safety risks, in addition to any potential impacts to Aboriginal Rights and interests. SVS reviewed both the SRBT licence application and the CNSC's review and assessment of the licence application, as presented in the Commission Member Document.

### 3.0 Algonquins of Ontario

### 3.1 Overview

The Algonquins of Ontario (AOO) are on a journey of survival, rebuilding and self-sufficiency – a journey of reconciliation. This journey began nearly 250 years ago when the first Algonquin petition was submitted to the Crown in 1772.

The Algonquins lived in present-day Ontario for thousands of years before Europeans arrived. Their territory originally extended from the St. Lawrence River to the French River in the west, south to the Adirondack mountains in New York State, and north above Lake Abitibi. Over the past several hundred years, the description of the unceded AOO Settlement Area has changed to be the lands and waters on both sides of the Kichi-Sìbì¹ (Ottawa River) watershed from modern Hawkesbury to Lake Nipissing and north past the headwaters of the Kichi-Sìbì. Today, the following ten Algonquin communities comprise the Algonquins of Ontario:

- The Algonquins of Pikwakanagan
- Antoine
- Kijicho Manito Madaouskarini
- Bonnechere
- Greater Golden Lake
- Mattawa/North Bay
- Ottawa

<sup>&</sup>lt;sup>1</sup> The Ottawa River, otherwise known as the Big River, has also been referred to in the Algonquin language as "Kichi-Sìbì," "Kichissippi" "Kitchissippi," and "Kichisippi."



- Shabot Obaadjiwan
- Snimikobi (Ardoch)
- Whitney and Area

Based on a protocol signed in 2004, these communities are working together to provide a unified approach to negotiate a modern-day treaty. The AOO land claim includes an area of nine million acres within the watersheds of the Kichi-Sìbì and the Mattawa River in Ontario. The majority of Algonquin Provincial Park lies within the Ottawa River watershed and thus within the unceded AOO Settlement Area.

The Algonquins of Pikwakanagan First Nation (known at the time as the Algonquins of Golden Lake) commenced the land claim by formally submitting the most recent petition with supporting research to the Government of Canada in 1983 and the Government of Ontario in 1985. The Province of Ontario accepted the claim for negotiations in 1991 and the Government of Canada in 1992. Since then, the negotiations, which are intended to culminate in an Algonquin Treaty, have grown to include ten communities that comprise the AOO.

The unceded AOO Settlement Area, shown in Figure 1 below, includes an area of more than nine million acres within the watersheds of the Kichi-Sìbì and the Mattawa River in Ontario, unceded territory that covers most of eastern Ontario, including Ottawa and most of Algonquin Provincial Park. More than 1.2 million people live and work within the unceded AOO Settlement Area. There are 84 municipal jurisdictions fully and partially located within the unceded AOO Settlement Area, including 75 lower- and single-tier municipalities and nine upper-tier counties.



# Algonquins of Ontario Settlement Area Boundary



Figure 1: Algonquins of Ontario unceded Settlement Area Boundary (Source: Algonquins of Ontario)

### 3.2 Algonquin Values and Teachings

Today, Algonquins in Ontario share a history of common interests, traditions and needs arising from our common heritage. In the following section, we will outline several Algonquin practices and teachings that are fundamental to putting this consultation and accommodation protocol in context.

In developing these comments, we have been guided by the spirit and intent of the Teachings of the Seven Grandfathers. These teachings have been passed down from generation to generation and continue to be practiced today:

- Honesty (Kwayakoziwin): Honesty in facing a situation is to be brave;
- Humility (Tabasenindizowin): Humility is to know yourself as a sacred part of Creation;
- Respect (Manàdjìyàn): To honour all Creation is to have Respect;
- Bravery (Songideyewin): Bravery is to face the foe with integrity;
- Wisdom (Nibwàkàwin): To cherish knowledge is to know Wisdom;
- Love (Sàgìhidiwin): To know Love is to know peace; and
- Truth (Tebwewin): Truth is to know all of these things



The AOO survival on this land for thousands of years required us to apply our teachings to ensure the protection of the lands and waters upon which we rely. These teachings serve as the original instructions or "natural laws" that were built into our way of life. "Sustainability" is a modern term, but sustainability was long in practice by our people and our ancestors. There were consequences that occurred when we strayed from our natural teachings, instructions, and laws. We were constantly monitoring the environment and if changes occurred, we would adapt. It was (and is) a matter of survival. We had, and continue to have, deep connections to the land.

Some examples of teachings related to the protection of the environment of today and yesterday include the following:

- Harvest one area for one season then move on elsewhere so the area that has been recently harvested can replenish.
- Be conscious of where your feet touch the ground (even as an individual, we can have impacts on the land).
- We are stewards of the land and have a responsibility to protect the lands and waters.
- Show love for all aspects of the environment, down to the smallest part.
- We are all part of nature we are all equal.

Protection and interaction with the lands and waters of our territory have been central to our existence for thousands of years. We maintained this connection to the land despite the arrival of Europeans to our territory. However, this arrival dramatically impacted our way of life.

Harvesting of flora and fauna for food and trade has been integral to the Algonquin way of life since time immemorial. These practices embody an inherent respect for the environment and a fundamental commitment to the sustainable management of resources that have been passed from generation to generation.

The rights of Aboriginal people in Canada to engage in traditional activities, including the harvesting of wildlife, fish, migratory birds, and plants, is recognized by the Constitution Act, 1982 and upheld by the Supreme Court of Canada. As stewards of our ancestral lands, the AOO recognize the importance of exercising this right in a responsible manner.

In 1991, the Algonquins of Golden Lake (Pikwakanagan) took a ground-breaking step with the establishment of its first Hunting Agreement which led to the development of today's AOO Harvest Management Plan for Algonquin Park and the Wildlife Management Units (WMU) within the Algonquin Territory in Ontario. The Harvest Management Plan is a living document, which is reviewed annually and updated as new information becomes available. Its primary purpose is to clearly articulate the framework in which the Algonquin harvest is conducted by Algonquin harvesters. In particular, the Harvest Management Plan contains clear provisions which specify the season and the geographic locations in which harvesting can occur, what the Sustainable Harvest Target is to be and who is eligible to participate.



Each year, the AOO establishes its Sustainable Harvest Targets for moose and elk for both Algonquin Park and each WMU for the Algonquin Harvest. These Sustainable Harvest Targets are established with input from the Ontario Ministry of Natural Resources and Forestry and are based upon data that addresses wildlife conservation and the sustainability of wildlife populations. The AOO is the one of the first Indigenous groups in Canada that has voluntarily enacted these types of harvest management practices.

To harvest moose and elk under the auspices of the AOO, eligible Algonquins have agreed to participate in a draw-based tag system that is coordinated by the ten individual AOO communities.

The AOO tradition of collectively sharing food and resources has been practiced by the Algonquins for millenniums. In the preservation of this long-held tradition, the sharing of food and resources continues to be commonly practiced today providing meat to Elders and other community members that are unable to participate in the harvest.

Despite such efforts as the Harvesting Agreement, we are now in great competition with many others on this land for the resources that are here.

### 3.3 AOO Rights and Interests

The SRBT facility falls directly within the AOO's unceded Settlement Area, as agreed to in the Agreement-in-Principle (AIP) signed by the AOO and the Governments of Ontario and Canada on October 18, 2016. The AOO assert unextinguished and constitutionally protected Aboriginal Rights and interests, including title to the AOO Settlement Area. The signing of the AIP was a key step toward a Final Agreement, and a modern-day Treaty, of which negotiations remain ongoing and will eventually clarify the rights of all concerned with respect to managing lands and resources. By signing the AIP, the AOO and the Crown expressed in a formal way their mutual intention and desire for a lasting partnership. This event signaled the beginning of a new relationship between the AOO and the Crowns, one in which the mistakes of the past must be supplanted by a new type of mutual respect and cooperation.

The AOO land claim was accepted by the Governments of Canada and Ontario for negotiation in the early 1990s and is currently in the final stage of treaty negotiations. When ratified, the agreement will take the form of a modern treaty and will provide certainty about the ownership, use and management of land and natural resources for Algonquins across the unceded AOO Settlement Area.

### 4.0 Review Findings

# 4.1 Summary of SRB Technologies (Canada) Inc.'s Licence Application

SRBT was first authorized for the operation of the tritium processing facility in 1990 under the Atomic Energy Control Board. Following this first license, SRBT has been issued several licenses by the CNSC and



its predecessor, the Atomic Energy Control Board. SRBT's current license was issued in 2015 for a period of seven years and is set to expire on June 30, 2022. The Proponent has indicated in their license renewal application that if they are granted a renewal of their current Class IB license, they intend to use the exact same systems and procedures that were used throughout their current licensed period. However, SRBT is requesting a renewed license term of 15 years instead of the previous licensed term of seven years.

The Proponent justifies a longer renewed license term of 15 years due to the stable and unchanging nature of the processing operations and the systems they have put in place to ensure low risk to the public, environment, and staff. The Proponent believes a longer license term would further SRBT's ability to secure financing and long-term contracts with customers and suppliers and increase the confidence of stakeholders that SRBT's operations present little risk to the community. The Proponent also believes a 15-year license term would allow resources to be better allocated to facility and operations improvements, instead of toward license renewal-related costs.

The SRBT nuclear substance processing facility manufactures tritium-powered self-luminous safety lights and devices. The facility is situated in TransCanada Corporate Park of Pembroke, Ontario at 320-140 Boundary Rd. The facility processes and incorporates tritium gas, acquired from the Tritium Removal Facility in Darlington, ON, into coated glass capsules. The tritium decays over time resulting in beta particles being emitted which excite a phosphorescent powder. The resulting product is a continuously illuminated light source that does not require external energy input to remain lit.

In their license application, the Proponent committed to ensuring the risks to their employees, the environment, and members of the public are as low as reasonably achievable; to minimize waste and maximize reuse and recycling opportunities, and to seek opportunities to improve safety and minimize impacts from their operations. The Proponent has also indicated that they will conduct annual internal audits to verify compliance with procedures and requirements, as a mechanism to ensure that their programs and systems are compliant both to regulatory requirements and internal policies and procedures.

The Proponent indicated in their license renewal application that several improvements have been made throughout their current license term to ensure safety is a priority. The Proponent highlighted that their Environmental Management System and Safety Analysis Report have been improved and modernized into full compliance with CSA standards. In 2020, SRBT completed an ERA in accordance with CSA Standards, which includes recommendations from CNSC staff that will be incorporated over the next four years. In 2020, community members from the Algonquins of Pikwakanagan First Nation assisted in the vegetation and environmental sampling activities for the ERA. The results of the ERA also informed an update to the Environmental Management System and related programs. SRBT states that their training program is reviewed annually and has been revised several times since 2015 to ensure improvements are made.

SRBT operates an Environmental Protection Program which includes a framework of monitoring, controlling, and minimizing tritium releases into the environment. This program includes the Environmental Monitoring Program, the Groundwater Protection Program, Ground Water Monitoring Program, and the Effluent Monitoring Program. As part of the Ground Water Monitoring Program, SRBT uses in-house monitoring practices, and compares its results to an independent third-party laboratory



each year. In 2020, monitoring services for air concentrations, precipitation and river water concentrations provided by an independent third-party laboratory were interrupted due the COVID-19 pandemic. As a result of this interruption, SRBT developed and implemented procedures to also conduct this monitoring in-house and decided to keep these monitoring activities in-house moving forward. SRBT are researching and planning to develop a dedicated in-house laboratory for low-level environmental sample counting.

As part of the Proponent's Radiation Safety Program, radiation risks are minimized through routine detection of radiation and radiological contamination using multiple stationery and portable instruments. As well, tritium-in-air monitors are located at strategic locations throughout active areas to allow for continuous monitoring. The SRBT facility is divided into three radiological safety zones based on the level of radiological hazards associated with each area and the contamination controls in place. Each area has specific controls to protect personnel from hazards, including personal protective equipment and clothing requirements, and buffer zones between areas. The facility's ventilation system includes negative-pressure ventilation where nuclear substances are processed, controlled, and monitored to ensure all tritium gas is removed from the area. The tritium which is released by the active ventilation system is monitored, quantified, and reported to CNSC staff annually. As well, routine contamination monitoring is conducted by SRBT to monitor the amount of contamination present at any given time. SRBT obtains data on employee effective doses of ionizing radiation through monitoring tritium concentrations using urinalysis. Over the past seven years, the Proponent has demonstrated that effective worker doses for employees and contractors working in the facility have been consistently well below the regulatory limits. As well, the maximum effective dose for a member of the public was well below the regulatory limit of 1 mS/year over the last 7 years. The Proponent reports that modeled emergency and accident scenarios show that even the most limiting emergency scenario would result in the anticipated effective dose to any person being well below regulatory limits for routine operations.

SRBT stated that over the course of the current operating license, no radiation or environmental protection-related action level has been exceeded, and the radiological impacts from their operations were demonstrated to be well within acceptable regulatory limits. This includes the limits on the amount of tritium possessed by SRBT at any time and the limits of tritium released into the environment in any form. Moreover, SRBT demonstrated through their Groundwater Monitoring Program that the average annual concentration of tritium decreased in all SRBT monitoring wells between 2015-2021, with only one isolated well (MW06-10) exhibiting an annual average tritium concentration of 30,153 Bq/L in 2021, which is more than the Ontario Drinking Water Guideline value of 7,000 Bq/L. SRBT has indicated that over the next 15 years they expect to see either a stable or increasing amount of tritium processed each year through at the facility. Despite the increase in production, SRBT has indicated that they will remain committed to maintaining either stable or decreased ratios of tritium released into the atmosphere compared to what is processed.

SRBT's production of gaseous tritium light sources and devices results in small quantities of tritium-contaminated waste materials being produced. SRBT has a Waste Management Plan in place to ensure that waste is minimized, assessed, stored, processed safely, and disposed of in accordance with all requirements. No safety issues or significant events related to waste management occurred during the current license phase.



SRBT state in their license renewal application that in 2019 they updated their Preliminary Decommissioning Plan for the facility, including a revised estimate for the cost of decommissioning. The SRBT Financial Guarantee for decommissioning is a cash fund held in escrow, and does not rely on any letters of credit, bonds, insurance, or other expressed commitments. In 2020, the value of the Financial Guarantee was increased to the revised estimate outlined in the updated Preliminary Decommissioning Plan. The Proponent has indicated that CNSC has accepted their revised Preliminary Decommissioning Plan and the updated cost estimate for facility decommissioning and that CNSC staff have confirmed that the proposed financial guaranteed instruments are acceptable and meet their expectations. There is no planned end date for the operation of the facility, and therefore there is no set time frame for the decommissioning phase of the facility to commence.

SRBT has described in their license renewal application that they are a member of the CCAB and have participated in outreach with local Indigenous communities throughout the license term. Outreach and engagement events highlighted within their application include collaboration with the Algonquins of Pikwakanagan First Nation (APFN) during vegetation and environmental sampling activities for the ERA project, observing Canada's National Day for Truth and Reconciliation, and participating in Indigenous Awareness training led by the First Peoples Group and coordinated through the Canadian Nuclear Association. SRBT has further outlined that they intend to continue building relationships with Indigenous communities in the vicinity of the facility.

# 4.2 Summary of CNSC Review of SRB Technologies (Canada) Inc. Licence Application

CNSC staff reviewed SRBT's licence application and have prepared a Commission Member Document based on their review and assessment. The document provides an overview of the CNSC staff review, assessment of the licence application and summary of the past performance of the facility. It also includes a proposed licence and licence conditions handbook. The handbook identifies compliance verification criteria, recommendations, and guidance to provide information to the Proponent on how to conform with the licence regulatory requirements.

As part of their review, CNSC staff evaluated the Proponent's planned measures, programs and procedures for each Safety and Control Area to verify that the Proponent could meet regulatory requirements and expectations associated with the issuance of the Class IB licence. The Safety and Control Areas assessed as part of CNSC's review included: management system, human performance management, operating performance, safety analysis, physical design, fitness for service, radiation protection, conventional health and safety, environmental protection, emergency management and fire protection, waste management, security, safeguards and non-proliferation, and packaging and transport.

Based on their review, CNSC staff determined that the Proponent's performance during the current licensing term was satisfactory and met regulatory requirements. Further to this, CNSC staff concluded that SRBT has sufficient measures in place to safeguard the environment, human health, and safety, and maintain security obligations during the proposed license term. The CNSC also verified that the Proponent's application complies with regulatory requirements. CNSC staff determined that the



proposed license period of 15 years is appropriate given SRBT's consistent and satisfactory performance over the current license period, and the sufficient reporting processes in place to monitor SRBT's performance over the proposed license period. CNSC staff recommend in the Commission Member Document that the Commission renew SRBT's licence to operate the proposed nuclear substance processing facility for the requested fifteen-year period (July 1, 2022, to June 30, 2037).

### 4.3 Evaluation and Recommendations

In Section 3.3.3 of SRBT's license renewal application, the Proponent states that the amount of tritium processed within their facility is expected to either remain stable or increase, and that they will ensure the ratio of tritium released to the atmosphere to tritium that is processed will remain stable or decrease with time. They did not provide further details on how the increased tritium processing and associated increased emissions would impact the local environment.

In Section 4.2 of SRBT's license renewal application, the Proponent notes that they intend to continue to build relationships with Indigenous communities. However, the Proponent provides no further details about continued engagement with the AOO throughout the proposed license term, beyond providing copies of the renewal application document.

Also in Section 4.2 of SRBT's license renewal application, the Proponent states that they collaborated with the Algonquins of Pikwakanagan First Nation (APFN) during the SRBT Environmental Risk Assessment (ERA) project, specifically in the process of environmental sampling and implementing recommendations from the initial ERA report.

Lastly, in Section 3.9.2 of SRBT's license renewal application, the Proponent noted that annual tritium concentrations (30,153 Bq/L in 2021) within groundwater monitoring well MW06-10 are well above the Ontario Drinking Water Quality Standard (7,000 Bq/L) and that the well is not a source of drinking water.

### 5.0 Summary and Conclusion

SRBT is a leader in the manufacturing and distribution of self-luminous safety signs and devices, including safety signs for harsh environments, aircraft safety signs and self-luminous devices for peacekeeping forces. If granted, the licence would allow SRBT to operate a tritium processing facility for the next 15 years for the purposes of manufacturing these radiation devices. SRBT has indicated in their license application that the activities under the requested license application are the same as those currently approved under their existing license application.

SRBT has demonstrated in their licence application that the effective dose to both nuclear energy workers and the public because of their facility operations are very low and within acceptable limits. SRBT also noted that during their current license term, there have been no action level exceedances, and their 2017 Safety Analysis Report reported that even under a worst-case incident, workers and members of the public are not expected to exceed the effective dose limits.

As the AOO did not identify any significant environmental or human health concerns during our review of SRBT's licence application, no issues or concerns have been identified by the AOO.



# **References**

Algonquins of Ontario. 2021. "Technical Review of the Canadian Nuclear Safety Commission Regulatory Oversigth Report for Uranium and Nuclear Substance Processing Facilities and Research Reactors in Canada: 2020."

