As part of ARIA's commitment to responsible research, the Exploring Climate Cooling programme requires that all outdoor experiments be subject to an environmental and legal assessment, which is made publicly available.

Nunavut has an established permitting process for scientific research, coordinated by the Nunavut Research Institute (NRI). As part of this, the Nunavut Impact Review Board (NIRB) undertakes an assessment (a "screening report") of the proposed project's potential socio-economic, environmental, and ecosystem impacts. The screening report therefore fulfils ARIA's requirements for an independent pre-experiment environmental impact assessment in that it recommends the conditions under which the research project can take place, or if further assessment is required. The screening report is made available on NIRB's website for public comment, and various relevant bodies are contacted for input.

In the case of **Real Ice** — a sub-team conducting outdoor experiments within the wider Re-thickening Arctic Sea Ice (RASi) project — the screening report indicated that no further assessment was necessary and that the experiment could proceed with conditions that the Real Ice team were able to satisfy. This then led to the provisioning of the formal research permit for their experiment.

Following review of the RASi project by the independent Oversight Committee, ARIA's CEO mandated an independent assessment to confirm that the Real Ice sub-team's plans complied with all relevant laws, regulations, and permitting requirements, including those relevant to Indigenous rights as set out in the UN Declaration of the Rights of Indigenous Peoples.

The independent assessment, completed on December 23, 2025 by Willms & Shier Environmental Lawyers LLP, concluded that Real Ice has all the permits and permissions required to proceed with the project. Specifically, the review confirmed:

- There are no aquatic species at risk or critical habitats in the project area.
- The project location was chosen in collaboration with the Ekaluktutiak Hunters & Trappers Organization (EHTO).
- The project's deep engagement with the EHTO and the Nunavut Impact Review Board (NIRB) process is consistent with the interpretation and application of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) in Canada.

In their assessment, Willms & Shier identified minor administrative steps for the project team to complete. ARIA's programme team worked directly with Real Ice to ensure these outstanding issues were resolved:

- **Permit typo:** The lawyers noted a typographical error on the Nunavut Research Institute (NRI) Scientific Research Licence (referencing NIRB file #25YN033 instead of the correct #23YN044) and noted it had not yet appeared on the NIRB public registry. The project team formally requested NRI to correct this typo on the public registry.
- **Transport Canada notification:** The legal review noted notice requirements for placing scientific equipment in navigable waters. In addition to following established local best practices — including clearly marking devices, logging coordinates, and directly informing the EHTO — the project team was instructed to utilise Transport Canada's "minor works" notification portal 48 hours prior to the placement of any relevant scientific equipment.

The full independent legal assessment provided by Willms & Shier Environmental Lawyers LLP is available below.

Willms & Shier | Environment Indigenous Energy Law

Memorandum

To: Mark Symes, Advanced Research and Invention Agency ("ARIA")

From: Willms & Shier Environmental Lawyers LLP ("Willms & Shier")

Date: December 23, 2025

File: 11265

Re: Review of Permitting Requirements for the Real Ice Development Company Limited

cc:

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1 BACKGROUND

Real Ice Development Company Limited ("Real Ice") is conducting an ice thickening field test near Cambridge Bay, Nunavut in winter and spring 2026 (the "Project"). ARIA is providing funding for the Project. ARIA has asked Willms & Shier to review Real Ice's permits to ensure that Real Ice has all necessary permits to proceed with the Project as planned.

Real Ice intends to begin the Project in January 2026.

2 PROJECT INFORMATION

Since 2023, Real Ice has undertaken a series of small-scale sea ice thickening field studies. The first study took place in January 2023 in Nome, Alaska. 2024 and 2025 field studies took place near Cambridge Bay, Nunavut. The Project will be the third time the study is carried out around Cambridge Bay.

We understand from the materials provided by Real Ice that the ice thickening studies have been designed to advance understanding in several key areas: the enthusiasm, interest and engagement of local communities with the research, the logistical and operational challenges of conducting research on the ice, the engineering feasibility of thickening sea ice through water pumping from beneath the ice surface, the scientific dynamics associated with snow flooding in the winter and, more recently, melt pond drainage during the spring season.

The Project involves thickening a designated section of sea ice (approximately 0.25 km^2) by pumping sea water into the snow on the ice. The Project site is a 1 km^2 area approximately 7 km from the Hamlet of Cambridge Bay and was chosen in collaboration with the Ekaluktutiak Hunters & Trappers Organization ("EHTO").



Ice thickening operations are expected to be completed by March 2026, then monitoring and measuring will occur until the melt season (melt season is expected to be May to July 2026). During the melt season, Real Ice will also perform small scale operations to test the effectiveness of melt pond drainage.

During the January to March period, Real Ice will set up a camp on the ice near the Project site, consisting of an Arctic quality tent that can host up to 6 people, and is equipped with a heater, additional clothing, and first-aid kit.

Ice and snow thickness, temperatures and salinity measurements will be taken actively (drilling holes and collecting ice cores) and passively (through embedded ice thickness measurement devices) throughout the winter and melt season.

Equipment used includes snowmobiles, submersible battery-powered electric powered pumps (each capable of a water flow of around 800L per minute), drones for monitoring ice melt, semi-automated ice thickness measurement devices, an albedo-meter and ice augers.

Water pumping is expected to occur for around 50 days between January and March 2026. Every day the pumping equipment (pumps, batteries, and accessories) will be transported from the Canadian High Arctic Research Station ("CHARS") to the Project site and back and pumping operations will run for a maximum of 7 hours during the daylight.

Semi-automated ice thickness measurement devices will be installed into the sea ice at the beginning of the winter. These devices are waterproof and equipped with GPS trackers and will be recovered after the melt season.

From the end of the winter and through all the melt season, an albedo-meter and an aerial drone will be used to measure surface albedo and broadband reflectivity of the test and control areas. This includes the final melt period when the sea ice is no longer safely accessible.

The Real Ice team will be hosted by CHARS in Cambridge Bay for the third winter in a row. CHARS will provide Real Ice with state-of-the-art facilities, storage, snowmobiles and living spaces. Real Ice will also work closely with EHTO, and EHTO members will be involved with the Project as local guides during day-to-day operations.

3 CONCLUSION

Based on our understanding of the Project, as set out above, and a review of relevant permitting requirements, Real Ice has all the permits and permissions required to proceed with the Project as planned for the 2026 season, subject to the outstanding issues and recommendations set out in Section 4, below.

Further, from our review of the documents provided, Real Ice has engaged with the local Inuit community through the EHTO. Real Ice has also worked through the Nunavut Impact Review Board process which provided opportunities for Inuit communities and individuals to participate in the decision-making process, consistent with the Nunavut Agreement and more generally with the interpretation and application of UNDRIP in Canada.

A full review of the permitting and engagement requirements is set out in Appendix A. Our review is based on the facts and assumptions set out in the documents provided. If you are aware of different facts or assumptions, please let us know immediately as this will impact our assessment.

4 OUTSTANDING ISSUES/ RECOMMENDATIONS

1 Real Ice's Scientific Research Licence for its 2026 field work states, "Licence holder is bound by the terms and conditions of the NIRB Screening Decision Report (File # **25YN033**) and the Department of Culture & Heritage archaeological sites terms and conditions".

It appears that #25YN033 is a typo and the Scientific Research Licence should refer to NIRB file #23YN044.

On the NIRB public registry, 25YN033 is a project on South Baffin Island by Nunavut Nukkiksautiit Corporation (NNC). This is an issue as the terms and conditions in the screening report for NNC's project do not apply to Real Ice's project, yet Real Ice's licences ties Real Ice to those terms and conditions.

As a result, we recommend that Real Ice request that NRI re-issue the licence with the correct NIRB file number. Real Ice has confirmed they will request the updated Scientific Research Licence from NRI.

2 Real Ice's Scientific Research Licence for its 2026 field work is not posted on the NIRB public registry. We understand from Real Ice that NRI sent the Scientific Research Licence to NIRB.

We recommend that Real Ice confirm in January 2026 that the Scientific Research Licence for its 2026 field work is posted on the NIRB public registry. Real Ice has confirmed they will follow up with NRI about posting the Scientific Research Licence on the NIRB public registry.

3 While not a permit, there are notice requirements to Transport Canada for the use of monitoring and measurement devices in navigable waters. Real Ice should provide the required notification to Transport Canada and confirm to ARIA that this has been completed.

APPENDIX A: PERMITTING AND ENGAGEMENT REQUIREMENTS

ANALYSIS

Based on our understanding of the Project following a review of the provided documents, we identified the following organizations/entities that may have relevant regulatory/permitting requirements.

In the table below, we review each organization and determine whether it is relevant to the Project.

Jurisdiction	Organization	Potentially Applicable Legislation	Potentially Applicable Permit Requirement	Applicable or Not Applicable	Comments
Federal (Canada)	Transport Canada (TC)	*Canadian Navigable Waters Act* *Arctic Waters Pollution Prevention Act*	Prohibition on constructing, placing, altering, removing or decommissioning a work in, on, over, under through or across any navigable water[1] without the appropriate approvals. Minor works are allowed in accordance with the Act.[2] Prohibition of deposit of waste in arctic waters	Applicable. Notice requirements, no permit required. Minor works requirements may be applicable to the ice monitoring devices that Real Ice will be installing and leaving on the ice until the ice melts. This does not require a permit, but there are requirements in the Minor Works Order that need to be followed, including notification requirements	On October 17, 2023, Transport Canada submitted a comment during the 2023 NIRB screening process stating that, "Transport Canada has reviewed the project proposal and does not have any comments to submit, as none of the project components fall within Transport Canada's mandate."

[1] Navigable water includes the Arctic Ocean.

[2] Section 39(1) of the Minor Works Order designates scientific equipment as a minor works. Section 39(2) defines scientific equipment as monitoring and measurement devices, and any associated buoys, platforms or other similar structures, installed in, on, under, through or across navigable water.

				under sections 4 and 8 of the Minor Works Order.[3] Based on our understanding of the Project, no obstructions or interference with navigation will occur at the Project site once ice melt occurs.	
	Environment and Climate Change Canada (ECCC)	*Species at Risk Act* (administered by both ECCC and DFO)	Need approval to undertake activities which may affect species listed on Schedule 1 of the Act	Not applicable. Based on our understanding of the Project, the Project will not affect species at risk, no monitoring or assessment of species at risk will occur, and no habitat of species at risk will be impacted during the Project.	Based on the aquatic species at risk map published by DFO and the critical habitat for terrestrial species at risk map published by ECCC, there are no aquatic species at risk/critical habitat in the Project area.[4] It is our understanding that Real Ice worked with EHTO to select a project area that would not interfere with wildlife/where wildlife have not

[3] Canadian Navigable Waters Act, Minor Works Order. Notification must be given prior to placing the scientific equipment and upon removal of the scientific equipment. Notification must be given in writing to a Canadian Coast Guard Marine Communications and Traffic Services Centre. Contact information for the Canadian Coast Guard Marine Communications and Traffic Services Centre in Iqaluit can be found here.

[4] Aquatic Species at Risk Map; Terrestrial Species at Risk Critical Habitat Map.

					been seen in recent years.
	Canadian Wildlife Service (CWS)	*Canada Wildlife Act* *Migratory Birds Convention Act*	Need a permit if engaging in certain activities in a National Wildlife Area (NWA) or Migratory Bird Sanctuary (MBS)	Not applicable. There are no NWAs or MBSs that cover the Project site.	The Ahiak Bird Sanctuary (a MBS) is located on the mainland, across from Cambridge Bay.[5]
	Fisheries & Oceans Canada (DFO)	*Fisheries Act* *Oceans Act*	A licence is required to fish/collect fish, cetaceans, or marine mammals for scientific purposes Authorization is required to disturb marine mammals The *Oceans Act* establishes Marine Protected Areas	Not applicable. The Project does not include the study and/or collection of fish and/or marine mammals. It is also our understanding that the Project will not disturb marine mammals or fish. No Marine Protected Areas are near the Project site.	The only Marine Protected Area in Nunavut is the Tuvaijuittuq Marine Protected Area, located in the marine waters off the northwest coast of Ellesmere Island.[6]
	Parks Canada (PC)	*Canada National Parks Act* *Canada National Marine Conservation*	A permit is required if engaging in certain activities in a National Park or Marine Conservation Area.	Not applicable.	There are no National Parks or Marine Conservation Areas near the Project site.[7]

[5] NWAs and MBSs can be viewed on this map and this map.
[6] List of Marine Protected Areas.
[7] Map of Canada's National Parks; map of Canada's Marine Conservation Areas.

		Areas Act			
	Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC)	*Territorial Lands Act*, Territorial Land Use Regulations	A land use permit is required for certain activities on Federal Crown Land, including fuel storage and the establishment of fieldwork campsites used for more than 100 days	Not applicable. The Project site, and corresponding field camp, is on sea ice, not Federal Crown Land.	CIRNAC submitted a comment during the 2023 NIRB screening process which provided the following recommendations: • Recommended standard terms and conditions regarding refueling of snowmobiles. • Recommended standard terms and conditions regarding consultation. • Recommended Proponent clarify potential impacts on water quality. • Recommended Proponent provide further information on hydrogen fuel used by the pump
Territorial (Nunavut)	Government of Nunavut	*Wildlife Act*	A licence is required for wildlife research and organized observation of wildlife	Not applicable. Based on our understanding of the Project, no research or organized observation of wildlife will be	

				conducted	
		Nunavut Act, Archaeological and Palaeontological Sites Regulation	A permit is required for the search or survey of archaeological and/or palaeontological sites and artifacts	Not applicable. Based on our understanding of the Project, no research will be conducted in relation to archaeological and/or palaeontological sites and artifacts	
		Umbrella Inuit Impact and Benefit Agreement for Territorial Parks in the Nunavut Settlement Area	A Territorial Parks Permit is required for any research activities taking place in a Territorial Park	Not applicable. There are no Territorial Parks within the Project Site.	Ovayok Territorial Park is the closest Territorial Park.[8]
	Nunavut Planning Commission (NPC)	*Nunavut Agreement* (Article 11) *Nunavut Planning and Project Assessment Act*	NPC is the gatekeeper for all project proposals. All activities proposed in Nunavut must first be submitted to the NPC for review. Proponents of projects must submit a project proposal to the NPC to determine whether the project conforms to the	Applicable. The Project must be submitted to the NPC for review.	The Project was submitted to the NPC in 2025 (and previously in 2023 and 2024). On August 15, 2025 the NPC issued a letter stating that the Project is outside the area of an applicable regional land use plan and that "the project is exempt from

[8] Territorial Park Map.

			requirements of any approved land use plans, and if so, whether the project type is exempt from the requirement for screening by NIRB.		screening by the NIRB because the NPC is of the understanding that the extension of the project duration and monitoring phase does not change the general scope of the original or previously amended project activities, and the exceptions noted in section 12.4.3(a) and (b) of the Nunavut Agreement do not apply".
	Nunavut Impact Review Board (NIRB)	*Nunavut Agreement* (Article 12) *Nunavut Planning and Project Assessment Act*	NIRB only screens project proposals which have been referred to it by the NPC. NIRB has jurisdiction to conduct impact assessments on project proposals within the land and marine areas of the Nunavut Settlement Area. NIRB will conduct a screening of the proposed project to determine if a full environmental	Applicable. Screening of the Project by NIRB is required.	In 2023, the Project underwent a screening by NIRB. The NIRB Screening Decision Report, dated October 31, 2023, states that a review of the Project is not required as the Project is not likely to cause significant public concerns and it is unlikely to result in significant adverse environmental and social impacts. The Screening Decision

			review is required. Upon conclusion of the screening process, NIRB provides its written report to the responsible Minister stating whether a full environmental review is required. If a review is not required, NIRB can recommend specific terms and conditions that apply in respect of the project.		Report contains 32 recommended project-specific terms and conditions. The NIRB recommendation requires approval from the responsible Minister. This can be provided formally by a letter from the Minister, or is assumed if the Minister does not provide a response within 15 days. It is our understanding a letter for the Minister was not received in relation to the project, as a result, the NIRB recommendation is deemed to be accepted.[9]
	Nunavut Research Institute (the science division of Nunavut Arctic College, "NRI")	*Scientists Act*	A Scientific Research License is required for research in Nunavut in the health, social sciences, or natural/physical sciences	Applicable. Real Ice must obtain a Scientific Research License from NRI as Real Ice is conducting research within the	Real Ice obtained a Scientific Research Licence in August 2025 for the 2026 research season. The licence is valid from January 10, 2026 to August 1,

[9] Section 93(3) of the *Nunavut Planning and Project Assessment Act*.

			disciplines. The licence applies to research regarding Nunavut's air, land, water and people. NRI does not licence research on wildlife (plants, fish, birds and marine/terrestrial wildlife).	natural/physical sciences discipline.	2026. Real Ice also obtained Scientific Research Licences for their field work in 2024 and 2025.
	Nunavut Water Board (NWB)	*Nunavut Agreement* (Article 13) *Nunavut Waters and Nunavut Surface Rights Tribunal Act*	The NWB regulates the use of water and deposit of waste in freshwater in Nunavut (inland water). Permits and approvals are required.	Not applicable. The Project is located offshore, in a marine area and involves the pumping of sea water, not freshwater.	
	Nunavut Wildlife Management Board (NWMB)	*Nunavut Agreement* (Article 5)	The NWMB is responsible for the management of all wildlife in Nunavut. Wildlife is defined in the Nunavut Agreement as all wild terrestrial, aquatic, avian and amphibian flora and fauna.	Not applicable. Based on our understanding of the Project, Real Ice will not have any interaction with marine mammals, birds, fish or plants as part of the Project and Real Ice is not conducting any research on wildlife.	

	Nunavut Surface Rights Tribunal (NSRT)	*Nunavut Agreement (Article 21)* *Nunavut Waters and Nunavut Surface Rights Tribunal Act*	The NSRT was established for the purpose of providing an independent mechanism for the resolution of disputes arising from access to surface land in Nunavut and/or claims for compensation arising from loss or damage to wildlife, carving stone or other specified substances	Not applicable.	The mandate of the NSRT relates largely to the use/access of Inuit Owned Land for mineral exploration and other commercial purposes. Section 15.2.3 of the *Nunavut Agreement* states that Inuit Owned Land does not extend to marine areas
Regional (Kitikmeot Region, Cambridge Bay)	Kitikmeot Inuit Association (KIA)	*Nunavut Agreement* – (Article 39 – NTI)	A Inuit Owned Land Use Licence is required for certain activities on Inuit Owned Land. KIA manages 106,360 square kilometers of Inuit Owned Lands in the Kitikmeot Region[10]	Not applicable. The Project takes place on sea ice.	Section 15.2.3 of the *Nunavut Agreement* states that Inuit Owned Land does not extend to marine areas.
	Kitikmeot Regional Wildlife Board (KRWB)	*Nunavut Agreement* (Article 5)	The KRWB manages harvesting of wildlife in the Kitikmeot Region	Not applicable. Based on our understanding of the Project, the Project does not involve hunting or	The Regional Wildlife Boards primarily regulate hunting and trapping activities in their respective areas.

[10] Map of Inuit Owned Land, published by CIRNAC.

				trapping.	
	Ekaluktutiak Hunters and Trappers Organization (EHTO)	*Nunavut Agreement* (Article 5)	The EHTO is the Hunters and Trappers Association for the Cambridge Bay region. Regulates harvesting practices and techniques among its members, among other things. The EHTO is consulted on projects during co-management processes in the region.	Not applicable. While there are no permits required from EHTO to conduct the Project, EHTO's support of the Project is integral to gaining other required approvals and to show adequate consultation and accommodation has occurred with potentially impacted parties.	EHTO has provided a letter of support, dated November 6, 2025, for the Project. It is our understanding that Real Ice is engaging frequently and deeply with EHTO.

INUIT ENGAGEMENT AND UNDRIP

In 1993, the Nunavut Land Claims Agreement (the "Nunavut Agreement") was signed as a modern treaty between Nunavut Inuit, represented by the Tungavik Federation of Nunavut, and the Government of Canada. It is the largest land claims settlement in Canadian history and led to the creation of Nunavut in 1999 and the Government of Nunavut.

The Nunavut Agreement established the Nunavut Settlement Area and various institutions of public government (i.e., co-management boards).

On June 21, 2021, the federal *United Nations Declaration on the Rights of Indigenous Peoples Act* ("UNDA") received Royal Assent and immediately came into force. The purpose of UNDA is to affirm the United Nations Declaration on the Rights of Indigenous Peoples ("UNDRIP") as an international

human rights instrument that can help interpret and apply Canadian law. UNDA also provides a framework to advance implementation of UNDRIP at the federal level. [11]

UNDA requires that the Government of Canada, in consultation and cooperation with Indigenous peoples, "take all measures necessary to ensure the laws of Canada are consistent with the Declaration, prepare and implement an action plan to achieve the Declaration's objectives, table an annual report on progress to align the laws of Canada and on the action plan". [12]

The Government of Canada states in a backgrounder that UNDA:

- only imposes obligations on the federal government. It is intended to create a framework to support the Government of Canada to further implement the Declaration, and
- affirms that the Declaration is a universal international human rights instrument with application in Canadian law. This means that the Declaration is an important source to interpret provincial and federal law. [13]

As a result of UNDA, UNDRIP has application in Canadian law. The Federal Court has confirmed that UNDRIP is part of Canadian law and must be used to interpret Canadian law.[14] A number of provinces and territories in Canada have also enacted their own UNDRIP legislation. Nunavut has not enacted its own UNDRIP legislation.

How UNDRIP is ultimately interpreted and applied in Canada is still subject to legal interpretation. The majority of court cases since the passage of UNDA have focused on the Crown's duty to consult and accommodate.[15]

In Canada, federal and provincial decision bodies hold a constitutional duty to consult with Indigenous people. This duty to consult is enshrined in section 35 of the *Constitution Act, 1982*, and is heightened by UNDRIP. While the veto power under the 'free, prior and informed consent' provision of UNDRIP has not been interpreted to apply in Canada, UNDRIP does function to ensure that a robust process and

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11 Government of Canada, "Backgrounded: United Nations Declaration of the Rights of Indigenous Peoples Act", last modified December 10, 2021, online: https://www.justice.gc.ca/eng/declaration/about-apropos.html

12 Government of Canada, "Backgrounded: United Nations Declaration of the Rights of Indigenous Peoples Act", last modified December 10, 2021, online: https://www.justice.gc.ca/eng/declaration/about-apropos.html

13 Government of Canada, "Backgrounder: United Nations Declaration of the Rights of Indigenous Peoples Act", last modified December 10, 2021, online: https://www.justice.gc.ca/eng/declaration/about-apropos.html

14 *Kebaowek First Nation v Canadian Nuclear Laboratories,* 2025 FC 319.

15 See for example, *Kebaowek First Nation v Canadian Nuclear Laboratories,* 2025 FC 319; *Eskasoni First Nation v Canada (Attorney General),* 2024 FC 1856; *Trans Mountain Pipeline ULC, Re*, 2023 CarswellNat 4148; and *NorthRiver Midstream NEBC Connector GP Inc., Re,* 2023 CarswellNat 4057.

deep engagement between decision bodies and Indigenous people occurs, including good faith consultation and cooperation, and meaningful and effective participation in decision-making processes.[16]

Project proponents do not hold the constitutional duty to consult. However, consultation with potentially impacted Indigenous groups is often key to moving projects forward in a timely manner, and procedural aspects may be delegated to proponents or boards/tribunals.

In this case, it is our understanding that Real Ice has engaged deeply with EHTO and has worked closely with EHTO to develop the project, including selecting the Project location and refining equipment. In addition, the NIRB process also notifies potentially impacted Indigenous groups about the project, receives and considers comments, and makes its recommendation based on these comments and other considerations.

As a result, based on our understanding of the Project and the engagement that has occurred, we do not have concerns about violations of UNDRIP.

OTHER CONSIDERATIONS

USE OF DRONES

In Canada, drones weighing more than 250 grams are required to be registered and the operator must have a drone pilot certificate. The weight of the drone does not include the remote but does include anything attached to the body of the drone, such as a camera. [17]

Real Ice has confirmed that their drone(s) are registered (and registration will be renewed as applicable) and two members of the team have a basic operations certificate for flying a drone up to 25kg within line of sight.

VIDEO FOOTAGE

Video footage of wildlife and people must not be collected without first notifying the Nunavut Film Development Corporation.

Video documentation of wildlife may also require permission from the Government of Nunavut's Department of Environment.[18]

1396-0928-6682, v. 1

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16 *Ibid* at paras 96-97, 119, 122, 128, and 131.
17 For more information about drone requirements, please see the following resources here and here.
18 See page 13 of the NRI's License Application Guidelines, dated May 2025.