NUNAVUT NUKKIKSAUTIIT CORPORATION

Project Proposal

Iqaluit Nukkiksautiit Project

July 2026

Submitted by
Dillon Consulting Limited

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Project Proposal – Iqaluit Nukkiksautiit Project

Dillon Consulting Limited (Dillon) is pleased to submit this Project Proposal for the Iqaluit Nukkiksautiit Project (INP) on behalf of the Nunavut Nukkiksautiit Corporation (NNC).

This Project Proposal summarizes the current proposed Project configuration, available baseline information, preliminary design basis, anticipated regulatory pathway, and current planning assumptions for the Iqaluit Nukkiksautiit Project. The information is provided to support the Nunavut Impact Review Board (NIRB) for project screening under the *Nunavut Planning and Project Assessment Act* (NuPPAA).

As the Project remains in the planning and preliminary design stage, certain construction-level details will continue to be refined through engineering studies, environmental fieldwork, Inuit engagement, Nunavut Water Board licensing, land use permitting, and other applicable regulatory processes.

Should you have any questions or require additional information in support of this submission, please do not hesitate to contact the undersigned.

Sincerely,

Dillon Consulting Limited

Michelle Roche, EP
Associate/Project Manager

MR:sk
cc: Keith Drover, Project Director, Nunavut Nukkiksautiit Corporation
Jill Byrne, Project Manager, Nunavut Nukkiksautiit Corporation

Our file: 25-1319

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Acronyms, Abbreviations, Definitions

CAAQS	Canadian Ambient Air Quality Standards
CEA	Cumulative Effects Assessment
CIRNAC	Crown-Indigenous Relations and Northern Affairs Canada
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DFO	Fisheries and Oceans Canada
ECCC	Environment and Climate Change Canada
ECR	Environmental Commitments Register
EIA	Environmental Impact Assessment
EIAS	Environmental Impact Assessment Scope
EIS	Environmental Impact Statement
EPP	Environmental Protection Plan
ESC	Erosion and Sediment Control
FEED	Front-End Engineering Design
GHG	Greenhouse Gas
GN	Government of Nunavut
HADD	Harmful alteration, disruption or destruction
HTA	Hunters and Trappers Associations
IAAC	Impact Assessment Agency of Canada
IQ	Inuit Qaujimajatuqangit (Inuit Traditional Knowledge)
INP	Iqaluit Nukkiksautiit Project
kV	Kilovolt

LPA	Local Project Area
MBCA	*Migratory Birds Convention Act*
Mm^3	million cubic meters
MW	Megawatt
NAD83	North American Datum 1983
NAPS	National Air Pollution Surveillance
NIRB	Nunavut Impact Review Board
NLUP	Nunavut Land Use Plan
NNC	Nunavut Nukkiksautiit Corporation
NPC	Nunavut Planning Commission
NRI	Nunavut Research Institute
NuPPAA	*Nunavut Planning and Project Assessment Act*
PDA	Project Development Area
QIA	Qikiqtani Inuit Association
RSA	Regional Study Area
SARA	*Species at Risk Act*
SAR	Species at Risk
SEIA	Socio-Economic Impact Assessment
TDG	Transportation of Dangerous Goods
TSS	Total Suspended Solids
VEC	Valued Ecosystem Component

Plain Language Summary

The Iqaluit Nukkiksautiit Project (INP) is an Inuit-led renewable energy project proposed for the Kuugaaluk River system on the Hall Peninsula. The Project is led by Nunavut Nukkiksautiit Corporation (NNC), a 100% Inuit-owned clean energy company. The purpose of the Project is to provide a reliable source of renewable electricity for Iqaluit and reduce reliance on diesel fuel imported from outside Nunavut.

The Project would include a hydroelectric facility with an installed generating capacity of up to 30 megawatts (MW) for the purpose of NIRB screening. Preliminary power and energy modelling has considered both 15 MW and 30 MW operating cases. The 15 MW case represents a lower operating scenario that may better reflect continuous or near-continuous generation under preliminary hydrologic assumptions, while the 30 MW case represents the proposed installed capacity and maximum design basis for screening. Final operating rules, generating output, reservoir drawdown, and seasonal production will be refined through detailed engineering, hydrologic monitoring, Inuit engagement, environmental assessment, and Nunavut Water Board licensing. Electricity would be produced by storing water from an existing lake and river system and releasing it through turbines. The main Project components would include a dam, reservoir, powerhouse, turbines, generators, spillways, intake structures, and other water control structures used to manage water levels and flows. The proposed reservoir is expected to cover approximately 7,136 hectares. Reservoir water levels would be managed to support power generation while maintaining downstream flow.

Other Project infrastructure would include three potential all-season access road route options, each approximately 66 km long, with one final route to be selected through detailed design, Inuit engagement, environmental fieldwork, and regulatory review. The 69 kV transmission line is proposed to be twinned with, and generally follow, the final selected all-season access road alignment. Temporary facilities, such as seasonal camps, laydown areas, work areas, and material borrow areas, would also be required during field studies and construction. Temporary areas would be removed or restored when they are no longer needed.

The Project is still in the planning and preliminary design stage. The size, location, and design of Project components will continue to be refined through engineering studies, environmental fieldwork, Inuit engagement, regulatory review, and future permitting. Details such as final road alignment, construction methods, water management plans, reservoir operating rules, and mitigation measures will be updated as more information becomes available.

The Project Area includes tundra, permafrost, freshwater systems, fish habitat, wildlife habitat, and areas used for Inuit travel and harvesting. Inuit Qaujimajatuqangit (IQ), or Inuit knowledge, has played an important role in shaping the Project to date. IQ helps inform decisions about Project siting, access routes, seasonal timing of work, wildlife protection, fish habitat, culturally important areas, and monitoring. NNC expects IQ and Inuit engagement to continue guiding Project planning, assessment, design, construction, and operations.

Environmental, socio-economic, and technical studies are ongoing. These studies include water flow, water quality, fish and fish habitat, wildlife, vegetation, permafrost, ground stability, archaeology, land use, and socio-economic conditions. The information collected can support future environmental assessment work if required, including preparation of an Environmental Impact Statement (EIS), and will help refine Project design, mitigation, monitoring, and safety measures.

The Project is being reviewed under the *Nunavut Planning and Project Assessment Act* (NuPPAA). It requires review by the Nunavut Planning Commission (NPC) and screening by the Nunavut Impact Review Board (NIRB). Based on current information, the Project does not require a federal impact assessment under the Impact Assessment Act. Federal, territorial, and other permits or authorizations will still be required for specific activities, including work in or near water, water use, land use, and works affecting navigable waters.

If approved and constructed, the Project has the potential to reduce diesel use in Iqaluit, subject to final design, approvals, construction, operations, and grid integration. It may also lower greenhouse gas emissions and improve long-term energy security. The Project may support Inuit employment, training, business opportunities, and participation in long-term asset management. NNC will continue to work with Inuit communities, regulators, and partners to support consideration of Inuit values, environmental protection, and territorial priorities as Project planning and regulatory review advance.

Executive Summary

The Iqaluit Nukkiksautiit Project (INP or "the Project") is an Inuit-led renewable energy project proposed within the Kuugaaluk River system on the Hall Peninsula, approximately 60 kilometres (km) northeast of Iqaluit, Nunavut. The Project is being advanced by Nunavut Nukkiksautiit Corporation (NNC), a 100% Inuit-owned clean energy company, and is intended to provide a long-term renewable electricity source for Iqaluit and reduce reliance on imported diesel fuel.

For the purpose of NIRB screening, the Project is being assessed on the basis of an installed generating capacity of up to 30 MW. This installed capacity represents the current maximum screening envelope for the hydroelectric facility and associated infrastructure. Preliminary power and energy modelling includes both 15 MW and 30 MW operating cases to evaluate water availability, reservoir performance, seasonal generation potential, and operating constraints. The 30 MW installed capacity should not be interpreted as continuous firm output under all hydrologic conditions. Generation levels will vary based on inflow, reservoir storage, environmental flow requirements, maintenance, electricity demand, and operating rules. These matters will continue to be refined through future design, hydrologic assessment, aquatic studies, Inuit engagement, and Nunavut Water Board licensing.

The current Project concept includes a dam, reservoir, powerhouse, turbines, generators, spillways, intake structures, access roads, temporary camps, laydown areas, material borrow areas, transmission infrastructure, and a new substation near Iqaluit to connect the Project to the existing electrical system.

The Kuugaaluk River system, meaning "big river" or "large river area" in local terminology, is a large, interconnected watershed of rivers and lakes that supports Inuit travel, harvesting, fish and wildlife habitat, and other important ecological and cultural functions. Inuit Qaujimajatuqangit (IQ), or Inuit knowledge, has informed Project planning to date and will continue to support decisions related to Project siting, access routes, seasonal timing, fish and wildlife protection, culturally important areas, monitoring, and future mitigation planning.

This Project Proposal has been prepared to support review by the Nunavut Planning Commission (NPC) and screening by the Nunavut Impact Review Board (NIRB) under the *Nunavut Planning and Project Assessment Act* (NuPPAA). It provides information on the current proposed Project configuration, preliminary design basis, environmental and socio-economic setting, baseline studies, anticipated regulatory pathway, engagement approach, and screening-level planning assumptions.

The Project remains in the planning and preliminary design stage. Project component locations, footprints, construction methods, reservoir operating rules, water-use requirements, fuel storage, access arrangements, and mitigation measures will continue to be refined through engineering studies, hydrologic modelling, environmental fieldwork, Inuit engagement, Nunavut Water Board licensing, land use permitting, and other applicable regulatory processes.

Environmental, socio-economic, and technical studies are ongoing and include water flow, water quality, fish and fish habitat, vegetation, wildlife, permafrost, geotechnical conditions, archaeology, land use, and socio-economic conditions. Information collected through these studies will support future environmental assessment work, including preparation of an Environmental Impact Statement (EIS) if required, and will inform Project design, mitigation, monitoring, and adaptive management.

At this stage, the INP has the potential to contribute to reduced diesel consumption and greenhouse gas emissions in Iqaluit, subject to final design, approvals, construction, operations, and grid integration. The Project may also support long-term energy security, Inuit employment, training, business opportunities, capacity development, and participation in Project planning, construction, operations, monitoring, and long-term asset management.

NNC will continue to engage with Inuit rights holders, communities, regulators, and other parties as Project planning and regulatory review advance. As additional field data, engineering information, and community perspectives become available, the Project Proposal and supporting documentation will be updated to reflect the current Project basis and applicable regulatory requirements.

1.0 Introduction

The Iqaluit Nukkiksautiit Project (INP or "the Project") is an Inuit-led renewable energy project. It proposes to build a hydroelectric power facility in the Kuugaaluk River system on the Hall Peninsula, approximately 60 km northeast of Iqaluit, NU. The Project is led by the Nunavut Nukkiksautiit Corporation (NNC), a 100% Inuit-owned clean energy company. The goal of the Project is to provide a reliable source of renewable electricity for Iqaluit and to reduce the use of diesel fuel brought in from outside Nunavut.

The Project would include a hydroelectric facility with an installed generating capacity of up to 30 MW for the purpose of NIRB screening. Preliminary power and energy modelling includes both 15 MW and 30 MW operating cases. Electricity would be produced by storing water from an existing lake and river system and releasing it through turbines. The main Project components would include a dam, reservoir, powerhouse, turbines, generators, spillways, intake structures, and other water-control structures used to manage water levels and flows. The proposed reservoir is expected to cover approximately 7,136 hectares at the current proposed Full Supply Level.

Other Project infrastructure would include three potential all-season access road route options, each approximately 66 km long, connecting Iqaluit to the Project site. The 69 kV transmission line is proposed to be twinned with, and generally follow, the final selected all-season access road alignment. A new substation near Iqaluit would connect the Project to the existing electrical system. Temporary facilities, such as seasonal camps, laydown areas, work areas, and material borrow sites, would be required during field studies and construction. Temporary areas would be removed or restored when they are no longer needed.

The following information is considered current proposed design-basis information for screening: Project location, general hydroelectric facility layout, proposed access road corridor, proposed transmission corridor, proposed reservoir Full Supply Level, proposed main Project components, construction camp concept, preliminary workforce accommodation strategy, aviation access approach, and conceptual construction sequencing.

The following information remains subject to refinement through future investigative studies and regulatory review: final access road alignment, final transmission pole or tower locations, final reservoir operating rules, construction water use volumes, final fuel storage volumes, final contractor equipment requirements, detailed construction methods, final camp servicing design, and final closure execution methods.

1.1 Project Proposal

Part 3 of the *Nunavut Planning and Project Assessment Act* (NuPPAA) sets out requirements for the assessment of project proposals in Nunavut. NNC is submitting this Project Proposal to support NIRB screening of the current proposed Project configuration.

1.1.1 Status of Information

Table 1 distinguishes between the current screening basis, preliminary design-basis information, ongoing baseline and investigative studies, and future construction-level details that will be confirmed through detailed engineering, contractor planning, Inuit engagement, Nunavut Water Board licensing, land use permitting, and other applicable regulatory review.

For screening purposes, the current proposed design basis includes:

- the Project location and general hydroelectric facility layout;
- the proposed reservoir Full Supply Level (FSL), Low Supply Level (LSL), and main Project components;
- three potential all-season access road route options;
- the proposed 69 kV transmission corridor, which is proposed to be twinned with the final selected all-season access road alignment;
- the construction camp concept and preliminary workforce accommodation strategy;
- the aviation access approach, which does not include permanent fixed-wing aircraft landing infrastructure as part of the current screening basis; and
- the conceptual construction sequencing, including site access, temporary facilities, major civil works, reservoir filling, commissioning, and transition to operations.

This Project Proposal is intended to serve as the controlling document for the NIRB screening record. Where minor discrepancies exist between this Project Proposal and appended historical or preliminary engineering materials, including the Tetra Tech Project Definition, the descriptions, footprints, volumes, screening assumptions, and commitments contained in this Project Proposal supersede the supporting appendices for the purpose of NIRB screening.

The following information remains subject to future refinement: final access road alignment; final transmission pole or tower locations; final reservoir operating rules; final construction water-use volumes; final fuel storage volumes and tank configurations; contractor-specific equipment requirements; detailed construction methods; final camp servicing design; final monitoring locations, parameters, and reporting procedures; and final closure execution methods.

Baseline and investigative studies remain ongoing for several environmental, technical, and socio-economic disciplines, including terrestrial resources, wildlife, avian resources, aquatics, hydrology, hydrometric monitoring, geotechnical conditions, permafrost, geochemical conditions, archaeology, and socio-economic conditions. The available information supports NIRB screening and identifies the current understanding of potential Project interactions. Additional study results will continue to refine Project design, effects assessment, mitigation, monitoring, management plans, and future regulatory applications.

Where future refinements materially change the Project footprint, water use, waste management, discharge management, fuel storage, access configuration, or potential environmental and socio-economic interactions, NNC will provide updated information to NIRB and applicable regulators before advancing the affected activity.

Table 1: Summary of Status of Information Collected

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
Project configuration	Current proposed Project configuration is provided for NIRB screening, including the hydroelectric facility, reservoir, access route options, transmission corridor, construction camp concept, and supporting infrastructure.	Project layout will continue to be refined through engineering, baseline studies, Inuit engagement, and regulatory review.	Final construction drawings, issued-for-construction specifications, as-built records, and permit-specific management plans.
Generating capacity	The Project is being screened on the basis of an installed generating capacity of up to 30 MW. Preliminary power and energy modelling includes both 15 MW and 30 MW operating cases.	Power and energy modelling will continue to be refined using hydrologic data, demand assumptions, reservoir operating rules, environmental flow requirements, and operating constraints.	Final turbine/generator selection, operating limits, commissioning plan, utility interconnection requirements, and operating procedures.
Reservoir and water management	Current screening basis includes the proposed reservoir, Full Supply Level, Low Supply Level,	Reservoir operation, filling rate, seasonal drawdown, downstream discharge,	Final reservoir filling plan, operating plan, water licence compliance points, flow-release requirements,

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
	reservoir filling, generation flows, spillway discharge, low-level outlet discharge, and instream flow release.	water quality, methylmercury screening, aquatic effects, and IFR requirements remain under study.	monitoring stations, and reporting procedures.
Access road	Three potential all-season access road route options are being carried forward for screening. Each route would connect Iqaluit to the Project site over an approximate distance of 66 km.	Final route selection will consider terrain, permafrost, hydrology, watercourse crossings, borrow sources, wildlife, archaeology, Inuit land use, harvesting, IQ, engineering feasibility, and regulatory input.	Final road micro-alignment, road width, grades, culverts, bridges, drainage design, construction methods, traffic controls, and as-built drawings.
Transmission line	A 69 kV transmission line is included in the screening basis and is proposed to be twinned with the final selected all-season access road alignment.	Final transmission routing will be refined after the access road alignment is selected and will consider terrain, geotechnical conditions, environmental constraints, land tenure, and utility design requirements.	Final pole or tower locations, foundation design, conductor specifications, grounding, access pads, right-of-way requirements, and as-built transmission drawings.
Construction staging and logistics	Conceptual construction sequencing, site support infrastructure, construction access, aviation access, material staging, and camp planning are included for screening.	Seasonal constraints, contractor means and methods, equipment needs, transportation logistics, water management, construction windows, and workforce planning will continue to be refined.	Final construction execution plan, contractor work plans, construction schedule, traffic management plan, environmental protection procedures, and site-specific mitigation.

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
Construction camp and workforce accommodation	Screening basis includes a temporary construction camp concept and preliminary workforce accommodation strategy.	Final camp size, occupancy, layout, water source, wastewater system, waste management, fuel storage, emergency response, and worker transportation remain subject to refinement.	Final camp layout, potable water system, sewage/wastewater system, fire safety systems, waste storage design, emergency response plan, and closure/restoration plan.
Fuel and hazardous materials	Screening basis includes fuel transport, temporary onsite storage, refuelling, containment, spill prevention, and hazardous materials management.	Final fuel volumes, tank configurations, storage locations, transport frequency, containment design, refuelling procedures, and hazardous materials inventory will be refined.	Final fuel management plan, engineered containment design, tank specifications, inspection forms, spill response equipment, and contractor procedures.
Water use and discharge	Construction and operation water uses are described at a screening level, including camp water, construction water, dewatering, reservoir filling, generation flows, IFR, wastewater, and discharge management.	Final withdrawal sources, volumes, discharge locations, discharge criteria, water quality monitoring, and reporting requirements will be refined through engineering and NWB licensing.	Final water management plan, water licence conditions, intake design, fish screening, metering, discharge controls, sampling program, and reporting forms.
Terrestrial studies	Available terrestrial information supports screening-level understanding of vegetation, wetlands, terrain, landforms, and habitat conditions.	Terrestrial studies remain underway, including vegetation, wetlands, terrain verification, rare plant potential, habitat mapping, and	Final pre-construction surveys, vegetation protection measures, restoration plans, site-specific mitigation, and construction monitoring procedures.

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
		disturbance footprint refinement.	
Wildlife studies	Available wildlife information supports screening-level understanding of wildlife habitat, movement, sensitive areas, and potential Project interactions.	Wildlife studies remain underway, including camera surveys, habitat assessment, species occurrence, movement patterns, sensitive areas, and seasonal use.	Final wildlife management plan, timing restrictions, site-specific mitigation, monitoring program, reporting procedures, and adaptive management triggers.
Avian studies	Available avian information supports screening-level understanding of migratory birds, raptors, nesting habitat, and sensitive seasonal periods.	Avian studies remain underway, including breeding bird surveys, raptor and nest searches where applicable, habitat assessment, and seasonal timing considerations.	Final bird protection measures, nest management procedures, timing restrictions, pre-construction surveys, and monitoring/reporting requirements.
Aquatic studies	Available aquatic information supports screening-level understanding of fish, fish habitat, water quality, downstream flow needs, and potential Project interactions.	Aquatic studies remain underway, including fish presence, fish habitat, fish movement, spawning and rearing habitat, water quality, downstream habitat, and effects of reservoir operation and IFR.	Final aquatic effects assessment, fish protection measures, in-water work plans, fish habitat offsetting if required, monitoring program, and authorization-specific conditions.
Hydrology studies	Preliminary hydrologic information supports screening-level flow estimates, reservoir operation assumptions, low-flow assessment, flood assessment, and IFR planning.	Hydrology studies remain underway, including flow monitoring, water balance refinement, low-flow analysis, flood assessment, climate sensitivity, reservoir	Final hydrologic design inputs, reservoir operating rules, flow-release requirements, flood routing, compliance locations, and reporting protocols.

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
		filling, and operational modelling.	
Hydrometric monitoring	Hydrometric monitoring is included as a key input for design, water licensing, reservoir operation, downstream flow management, and IFR refinement.	Hydrometric studies remain underway, including monitoring station operation, flow measurements, rating curves, downstream flow monitoring, and data quality review.	Final hydrometric monitoring network, station locations, instrumentation, QA/QC procedures, data management, and NWB reporting requirements.
Geotechnical studies	Preliminary geological and terrain information supports screening-level understanding of dam foundations, road design, borrow sources, powerhouse siting, and constructability.	Geotechnical investigations remain underway, including boreholes, test pits, foundation assessment, borrow and quarry evaluation, slope stability, and material suitability.	Final geotechnical design report, foundation design, material specifications, slope stabilization measures, construction QA/QC, and geotechnical monitoring.
Permafrost studies	Permafrost is identified as a key design and environmental consideration for foundations, roads, drainage, borrow areas, and long-term infrastructure performance.	Permafrost studies remain underway, including ground temperature, ice content, active layer conditions, thermal modelling, terrain sensitivity, and infrastructure interaction.	Final thermal design criteria, foundation treatments, road embankment design, monitoring instrumentation, maintenance requirements, and adaptive management procedures.
Geochemical studies	Geochemical considerations are included for material sourcing, excavation, borrow and quarry development, aggregate use, waste	Geochemical studies remain underway, including acid rock drainage/metal leaching assessment, material characterization, borrow/quarry testing,	Final geochemical management plan, material handling criteria, segregation procedures, runoff controls, sampling requirements, and monitoring/reporting program.

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
	rock, and water quality protection.	and runoff quality considerations.	
Archaeological and heritage studies	Available archaeological information supports screening-level understanding of archaeological sensitivity, cultural resources, travel routes, and areas of Inuit land use.	Archaeological studies remain underway, including field survey, site identification, avoidance planning, engagement, and assessment of areas affected by reservoir, road, transmission, and construction footprints.	Final heritage resource protection plan, avoidance buffers, chance-find procedure, site-specific mitigation, construction monitoring requirements, and permit conditions.
Socio-economic studies	Available socio-economic information and engagement input support screening-level understanding of employment, training, business opportunities, accommodation, harvesting, land use, and energy security.	Socio-economic studies remain underway, including community engagement, labour and training assessment, local business capacity, accommodation planning, land use, harvesting, community well-being, and distribution of benefits and effects.	Final socio-economic management measures, employment and training plans, procurement strategy, accommodation plan, community communication procedures, and monitoring/reporting commitments.
Inuit Qaujimajatuqangit and engagement	IQ and Inuit engagement have informed Project planning, including site selection, access routing, seasonal timing, fish and wildlife concerns, cultural values, and monitoring.	Engagement remains ongoing with Inuit rights holders, communities, organizations, and regulators. Additional IQ will continue to inform route selection, mitigation, monitoring, and effects assessment.	Final engagement commitments, issue tracking, community monitoring roles, communication protocols, construction notification procedures, and adaptive management measures.

Information Area	Current Status for NIRB Screening	Information Underway / To Be Refined	Future Construction-Level or Permit-Level Information
Environmental effects and mitigation	Potential effects and mitigation are assessed at a screening level based on the current Project footprint, available baseline information, preliminary design, and IQ.	Effects assessment will continue to be refined as design advances and additional baseline, IQ, and regulatory information becomes available.	Final Environmental Protection Plan, discipline-specific management plans, contractor mitigation procedures, monitoring plans, and compliance reporting.
Decommissioning and closure	Conceptual decommissioning and closure considerations are included for screening.	Closure objectives, infrastructure disposition, reservoir management, road access, transmission line removal or retention, revegetation, and long-term monitoring will continue to be refined.	Final closure and reclamation plan, financial security estimates, decommissioning drawings, waste removal plans, and post-closure monitoring requirements.
Regulatory coordination	Anticipated regulatory coordination includes NIRB screening, NWB licensing, land use permitting, Fisheries Act review, navigation review, heritage permitting, and other applicable approvals.	Regulatory requirements will continue to be refined through agency review, baseline studies, design progression, engagement, and permitting discussions.	Final permit applications, licence terms and conditions, compliance plans, reporting schedules, and authorization-specific management plans.

1.1.2 Community Benefits and Inuit-Led Opportunities

The INP is intended to deliver long-term community and socio-economic benefits beyond the provision of renewable electricity. As an Inuit-led initiative, the Project is being developed to strengthen Inuit participation, leadership, and capacity in clean-energy development while supporting Iqaluit's transition away from diesel-based power generation.

The Project presents opportunities for Inuit employment and skills development across all phases of Project planning, construction, operations, and monitoring. These opportunities are expected to include participation in baseline field programs, environmental monitoring, construction activities, operations and maintenance, and long-term asset management. Training and capacity-building will be integrated into Project delivery to support the development of a local workforce with transferable skills in renewable energy, environmental management, and infrastructure operations.

Long-term Inuit ownership of the Project is a foundational element of the INP. By advancing an Inuit-owned renewable energy asset, the Project supports local energy planning, increased local control over essential infrastructure, and long-term economic benefits that remain within Nunavut communities.

1.1.3 Regulatory Context

Table 2 lists the potential authorizations applicable to the development of the Project and the agencies expected to have a role in authorizing one or more aspects. At this early stage of the public review of the Project, NNC anticipates that further engagement with regulators will be needed to confirm required regulatory approvals to construct and operate the Project.

Table 2: Anticipated Approvals Required for the Project

Permit/Approval/ License/Authorization	Agency	Activity
Conformity Determination	Nunavut Planning Commission	Conformity to Land Use Plan Determination
NIRB Screening Decision Report /Project Certificate if required following Review	Nunavut Impact Review Board	Screening under NuPPAA to determine whether the Project may proceed without review, requires review, or should be modified or abandoned. If the Project is referred to and approved following a Review, a Project Certificate may be issued.
Type 'A' Water Licence	Nunavut Water Board	Water use, waste disposal and discharge to the environment for the Project
Class 'A' Land Use Permit	Crown Indigenous Relations and Northern Affairs Canada	Development of hydro dam and related infrastructure on Crown Land
Fisheries Authorization	Fisheries and Oceans Canada	Authorization and appropriate compensation for development of hydro dam and related infrastructure in waterbodies
Navigable Waters – Application for Approval	Transport Canada	Authorization to construct on any navigable body of water

1.1.4 Federal Impact Assessment Act

At this stage, the Project is not listed under the *Physical Activities Regulations* of the federal *Impact Assessment Act* (**Appendix A**). The Project has been identified on the federal Nation-Building Projects List, reflecting its strategic importance in advancing clean energy, energy security, and long-term infrastructure development in Nunavut. This designation is intended to facilitate coordination among federal departments and agencies.

Territorial review under the *Nunavut Planning and Project Assessment Act* (NuPPAA) remains the primary regulatory pathway for the Project. Federal involvement is expected to occur through discrete regulatory authorizations such as those under the *Fisheries Act* and the *Canadian Navigable Waters Act* and through coordinated processes where applicable, without altering statutory requirements or the independence of the NPC and NIRB. Any determination regarding the applicability of a federal impact assessment, including potential section 82 considerations, will be confirmed in consultation with the Impact Assessment Agency of Canada (IAAC) as Project scope and design continue to advance.

1.2 Proponent Information

Proponent: Nunavut Nukkiksautiit Corporation (NNC)

Type: 100% Inuit-owned clean energy corporation

Address: 200 – 5300 Qulliq Court
Iqaluit, NU X0A 2H0

Contact: Keith Drover, Project Director or Jill Byrne, Project Manager, NNC

Consultant: Dillon Consulting Limited – Environmental Assessment and Permitting Lead: Michelle Roche.

The Nunavut Nukkiksautiit Corporation (NNC) is a 100% Inuit-owned corporation created to pursue clean energy projects across the Qikiqtani Region. Partnerships have been created with Qikiqtani communities to invest in, own, and operate local renewable energy systems. NNC tailors renewable energy projects to the individual needs and resources of each community. This is accomplished by selecting the optimal mix of clean energy technologies such as solar, wind, hydro, tidal, and energy storage systems based on the determinants of each community. Their primary goal is to develop solutions that are affordable, reliable, and accessible to bring potential benefits to communities.

By developing projects with the intent to own them in partnership with communities for the entire life of the infrastructure, NNC strives to ensure all renewable energy projects in Nunavut are technically and financially sound for the benefit of future generations.

2.0 Project Overview

The Iqaluit Nukkiksautiit Project ("the Project") is an impoundment hydropower facility in the Kuugaaluk area (also known as: McKeand River South), approximately 60 km northeast of Iqaluit. The goal of the Project is to provide Iqalungmiut with a reliable renewable energy source. The initial Project build-out includes a hydropower facility up to 30 MW to meet current and future electrical load demands for Iqaluit including heating and industry expansion. The hydropower facility is intended to reduce reliance on diesel generation and may serve as a primary renewable energy source for Iqaluit, subject to final design, approvals, operations, and grid integration.

The Project reflects a broader vision beyond energy generation alone. It is intended to serve as a lasting, Inuit-owned asset that supports local employment, training, and business development, while contributing to greater energy independence in Nunavut. In addition to its environmental and economic benefits, the Project is being developed with a strong emphasis on respecting Inuit knowledge, land use, and environmental values, ensuring that its design and implementation align with community priorities and long-term sustainability.

The main components of the Project include:

- The Main Dam;
- Reservoir;
- Low-Level Outlet Works;
- Spillway;
- Intake and Penstock;
- Powerhouse;
- Tailrace;
- Site Access Roads; and
- Substation and Transmission Line.

The key Project attributes are summarized in **Table 3**:

Table 3: Project Attributes

Attribute	Value
Dam Height - max (m)	~50
Dam Crest Elev. (m)	553
Spillway Crest Elev. (m)	550

Attribute	Value
Full Supply Level Elev. (m)	550
Low Supply Level Elev. (m)	528
Intake Invert Elev. (m)	512
Low Level Outlet (LLO) Invert Elev. (m)	506
Total Storage (dam^3)	1,391,033
Live Storage (dam^3)	1,091,703
Power Generating Capacity	Up to 30 MW

The design process is ongoing, and some values represent current preliminary design-basis estimates. For NIRB screening, the Project is being presented as a hydroelectric facility with an installed generating capacity of up to 30 MW. Preliminary power and energy modelling has considered both 15 MW and 30 MW operating cases. The 15 MW case provides a lower operating scenario for assessing water availability and year-round generation potential, while the 30 MW case represents the proposed installed capacity and maximum screening envelope. The final operating regime, including actual generating output, reservoir drawdown, instream flow releases, seasonal operating constraints, and discharge management, will be refined through further engineering, hydrologic monitoring, aquatic studies, Inuit engagement, and Nunavut Water Board licensing.

2.1 Project Location and Setting

2.1.1 Geographic Context

The INP is located within the Kuugaaluk River system on the Hall Peninsula, approximately 60 kilometres (km) northeast of Iqaluit (**Figure 1**). Site selection was guided by hydropower potential, low cultural conflict, and alignment with IQ site evaluation criteria (Nunavut Nukkiksautiit Corporation, 2025).

2.1.2 Coordinates and Mapping

The current proposed Project layout is shown in **Figures 1 to 10** and in the supporting spatial files submitted with this revised Project Proposal. **Table 4** summarizes the purpose of each figure and identifies how each figure supports NIRB's review of the proposed Project components, routes, study areas, and temporary infrastructure.

Table 4: Map Summary

Spatial Information	Figure / File	Purpose
Project Location	Figure 1	Shows Project location relative to Iqaluit and surrounding regional context
Local Project Area	Figure 2	Shows the proposed reservoir location
Regional Study Area	Figure 3	Shows the broader area used to frame environmental and socio-economic setting
Archaeological and environmental sensitivity overlays	Figure 4	Shows known sensitivity areas used to inform screening and future fieldwork
Environmental Study Areas	Figure 5	Shows study areas used for baseline and future assessment work
Land use	Figure 6	Shows known land-use context
Consolidated Project layout	Figure 7	Shows proposed permanent hydroelectric facility components and three proposed access routes
Road and transmission alignment	Figure 9	Shows 3 proposed access road route and 69 kV transmission corridor
Reservoir configuration	Figure 10	Shows current proposed reservoir inundation boundary at FSL 550 m
Digital spatial files	GIS/KMZ/Shapefile package	Provides digital Project component boundaries and alignments for review

Figure 7 shows the current proposed consolidated Project layout for screening, including the proposed permanent components associated with the hydroelectric facility. These components include the dam, reservoir, powerhouse, three proposed access roads (only one will be selected for final design), transmission line, substations, and related infrastructure. Figure 7 also shows the proposed access and transmission routes and the relationship between major Project components. Final construction-level refinements to component locations, route alignment, and infrastructure footprints may occur following investigative studies, engineering review, environmental fieldwork, Inuit engagement, and applicable regulatory review.

Figure 9 shows three potential all-season access road routes being carried forward for screening. The final all-season access road route has not yet been selected. Each route option would connect Iqaluit to the Project site over an approximate distance of 66 km.

The 69 kV transmission line is proposed to be twinned with, and generally follow, the final selected all-season access road alignment. Co-locating the transmission line with the selected access road corridor would support construction access, inspection, maintenance, and emergency response, while reducing the need for a separate linear corridor. Final route selection, road micro-alignment, transmission pole or tower locations, watercourse crossing details, and construction-level design refinements will be confirmed during detailed design, Inuit engagement, and applicable regulatory review.

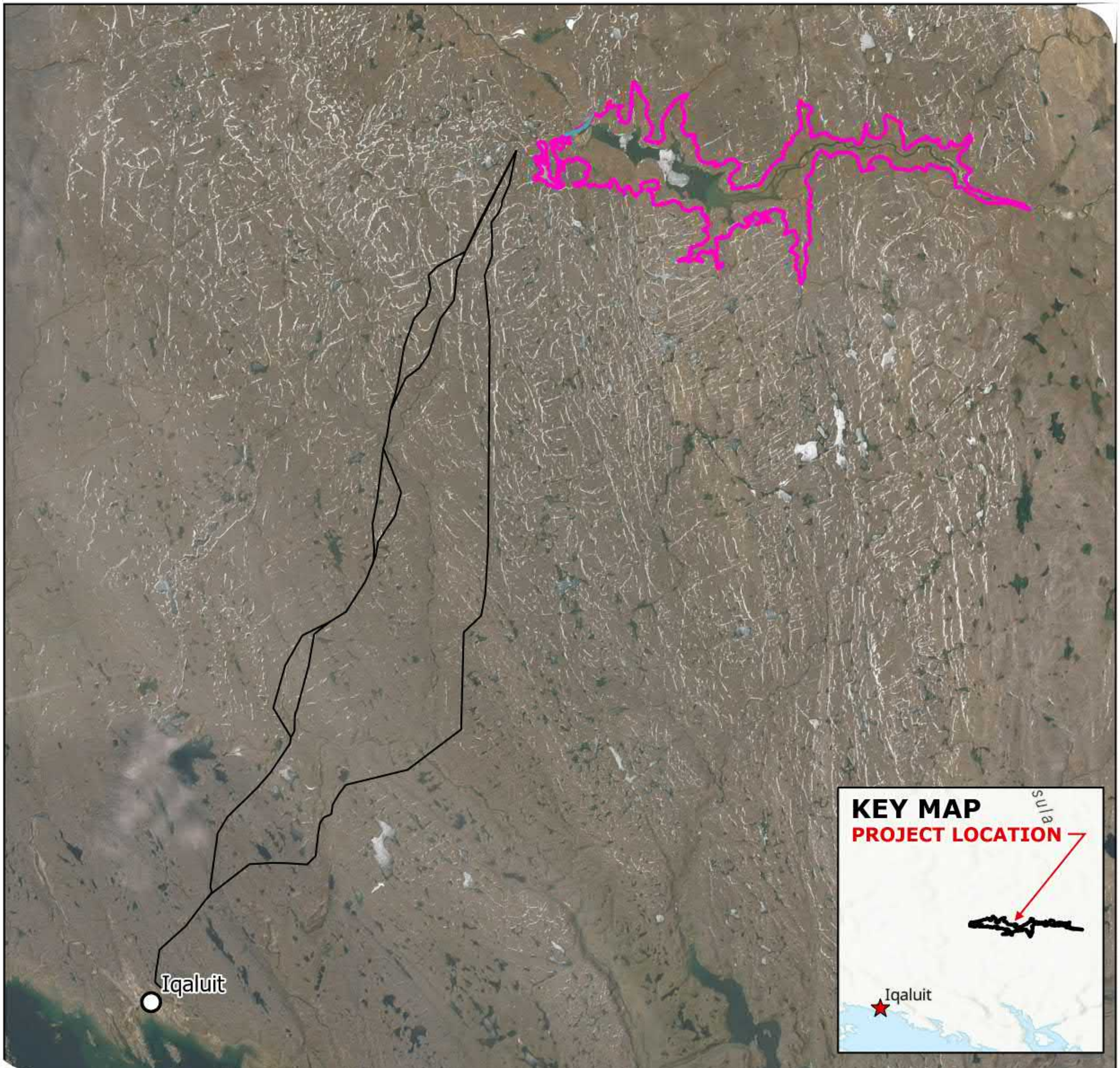
Figure 10 shows the current proposed reservoir inundation boundary at a Full Supply Level of 550 m. The final construction-level reservoir boundary will be confirmed through hydrologic modelling, bathymetry, geotechnical investigations, engineering design, and regulatory review. Based on current mapping, the Project components are located on Crown land. Approximate coordinates for key Project features are summarized in **Table 5**. Coordinates are provided for screening and orientation purposes. Linear features, such as the access road and transmission line, are represented by approximate start and end points, with the detailed alignments provided in the supporting spatial files. Area-based features, such as the reservoir and temporary camp, are represented by approximate centroid or representative points, with boundaries provided in the supporting spatial files.

Table 5: Project Feature Locations (Approximate) (North American Datum 1983 [NAD83])

Project Feature	Latitude (N)	Longitude (W)
Dam	64.189769	-68.012175
Reservoir	64.168781	-67.909977
Access Road Start (High)	63.756403	-68.509738
Access Road End (High)	64.178917	-68.088568
Access Road Start (Direct)	63.756396	-68.509722
Access Road End (Direct)	64.179116	-68.088561
Access Road Start (Flatter)	63.756389	-68.509722
Access Road End (Flatter)	64.178984	-68.088809

2.1.3 Environmental and Cultural Setting

The Project Area (**Figure 1**) is characterized by Low Arctic tundra ecosystems, continuous permafrost, and a landscape shaped by frost action, shallow drainage networks, and glacial landforms. Vegetation communities include dry lichen tundra, mesic and wet graminoid tundra, and sparsely vegetated fellfield and riparian habitats (EcoLogic, 2025). Human activity in the area is seasonally limited, with intermittent travel, harvesting, and land use occurring along portions of the Kuugaaluk River System, as identified through IQ and early engagement with HTAs (NNC, 2025a).



NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

PROJECT LOCATION

FIGURE 1

Iqaluit
Dam
Potential Access Roads
Main Reservoir

MAP DRAWING INFORMATION DATA PROVIDED BY: NUNAVUT NUKKIKSAUTIIT CORPORATION, GOVERNMENT OF NUNAVUT, NATURAL RESOURCES CANADA, DILLON CONSULTING LIMITED, ECOLOGIC CONSULTANTS LIMITED

MAP CREATED BY: -EES
MAP CHECKED BY: -MR
MAP PROJECTION: NAD 1983 CSRS UTM Zone 19N

DILLON CONSULTING

N W E S

SCALE 1:300,000

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PROJECT: 25-1319
STATUS: DRAFT
DATE: 2026-07-02

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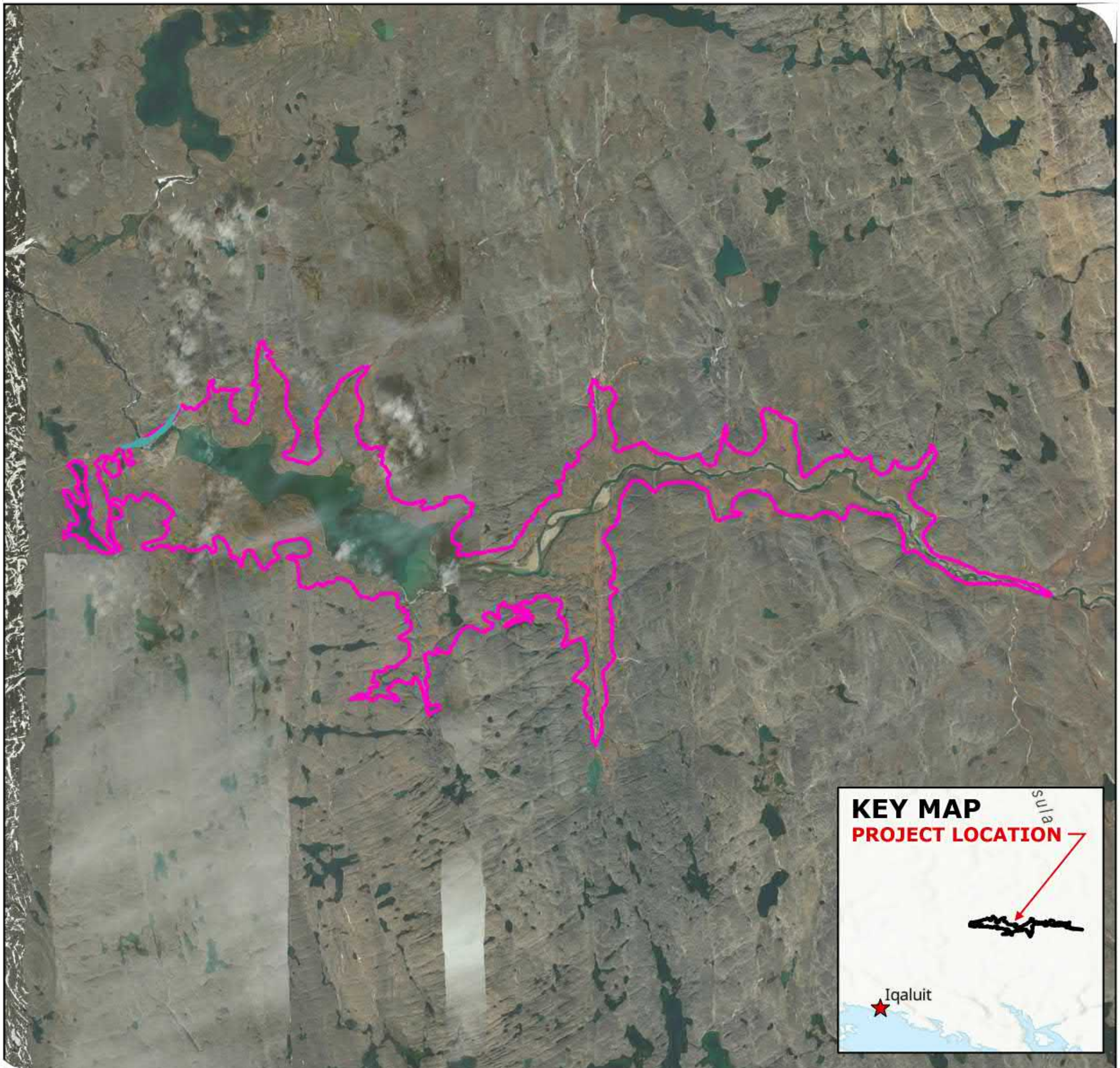

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

LOCAL PROJECT AREA

FIGURE 2

Dam

Main Reservoir

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DILLON CONSULTING

N W E S

SCALE 1:150,000

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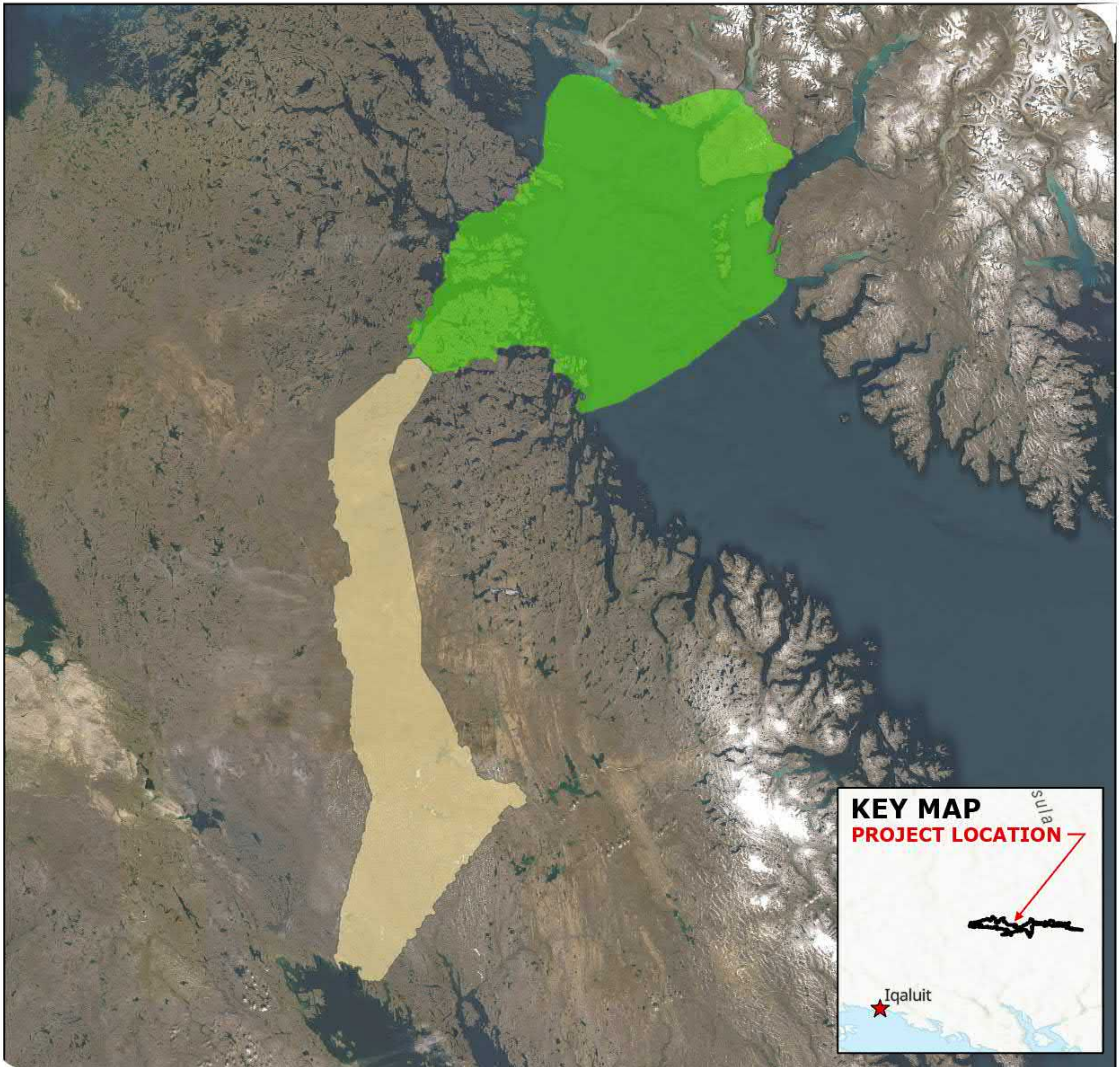

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

REGIONAL STUDY AREA

FIGURE 3

Downstream Sampling Extent

Summer Study Area

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PROJECT: 25-1319
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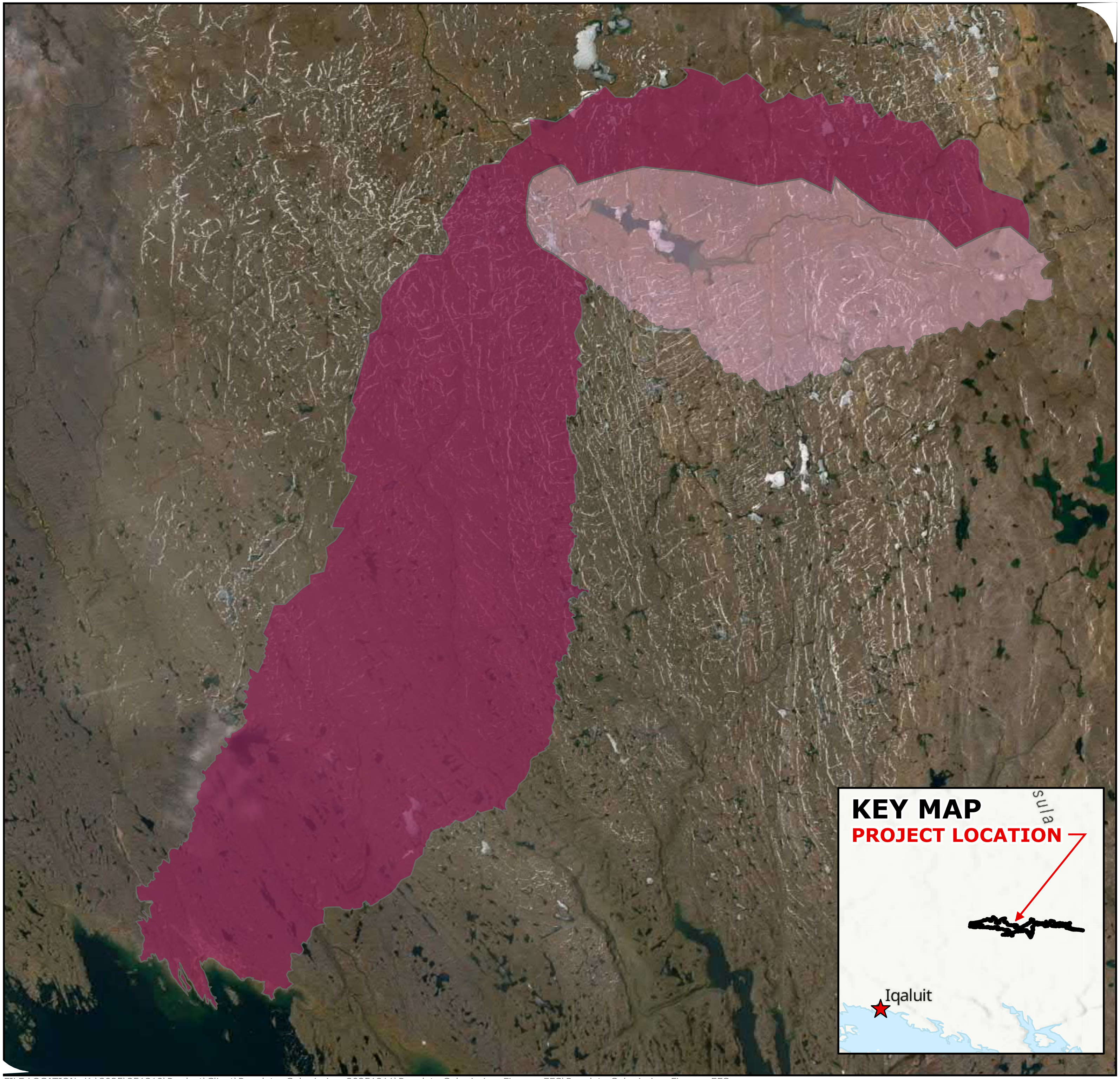

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

ARCHEOLOGICAL SENSITIVITY AREAS

FIGURE 4

- Approximate Archeological Assessment Area 2025
- Proposed Archaeological Assessment Area 2026

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DILLON CONSULTING

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SCALE 1:350,000

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PROJECT:25-1319
STATUS: DRAFT
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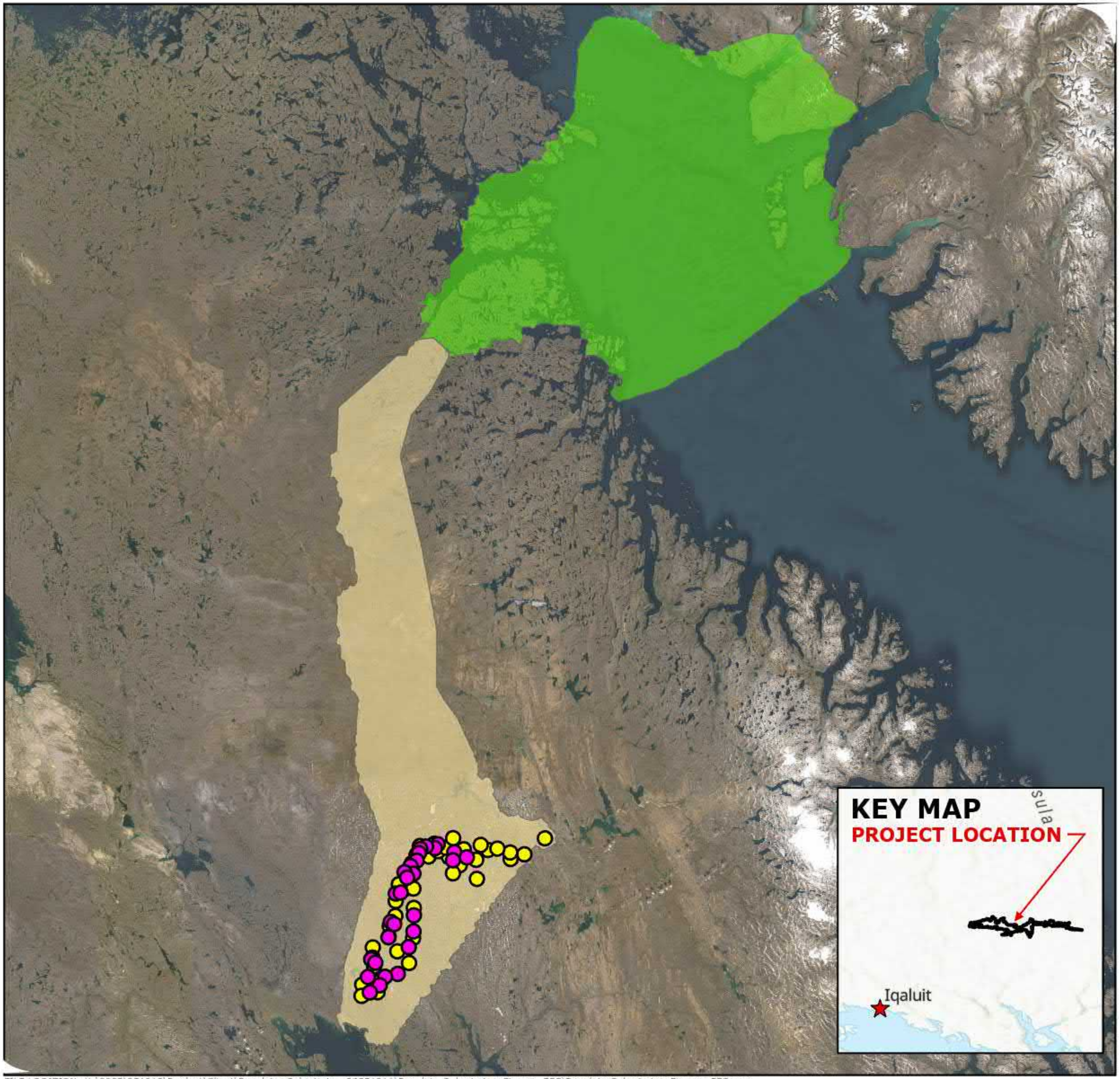

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

ENVIRONMENTAL STUDY AREAS

FIGURE 5

- Wildlife Transect
- Wildlife Camera
- Downstream Sampling Extent
- Summer Study Area

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N W E S

SCALE 1:1,500,000

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PROJECT:25-1319
STATUS: DRAFT
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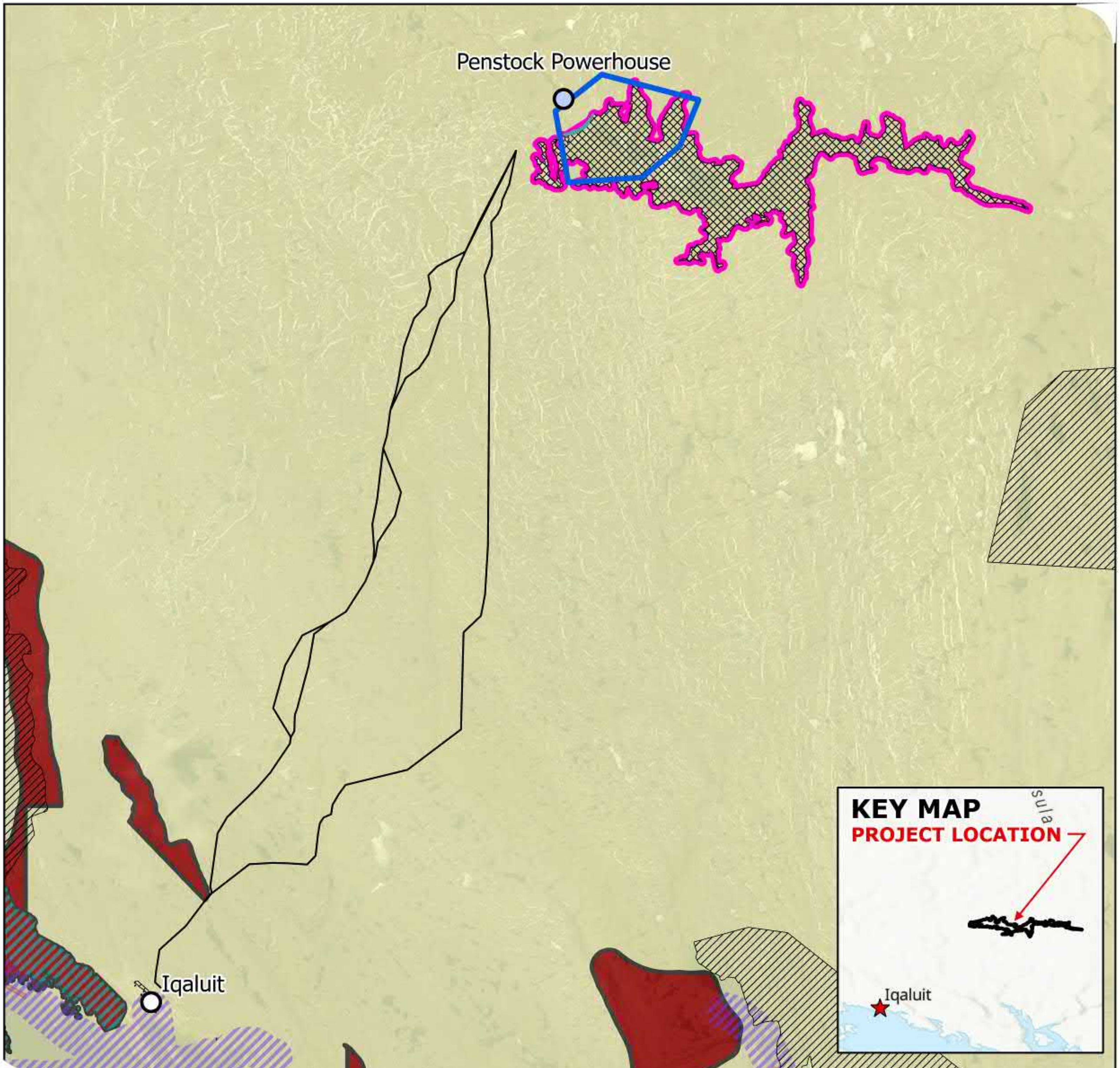

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

LAND USE

FIGURE 6

Iqaluit
Penstock Powerhouse
Dam
Potential Access Roads
Transmission Lines
Main Reservoir
Approximate Temporary Camp Location
Inuit Owned Lands
Spillway

Land Use Designations
Conditional Use
Limited Use
Mixed Use
overlay zone

Land Use Areas
defense
settlement
pollution/waste
community use
commercial fisheries
water
transportation & communication
wildlife habitat
conservation

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MAP CHECKED BY: -MR
MAP PROJECTION: NAD 1983 CSRS UTM Zone 19N

DILLON CONSULTING

N W E S

SCALE 1:300,000

0 2.75 5.5 km

PROJECT: 25-1319
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DATE: 2026-07-02

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The region holds cultural significance due to its relationship to travel routes, seasonal harvesting patterns, and long-term Inuit use of inland waterways. Archaeological reconnaissance, cultural land-use mapping, and additional IQ documentation will be completed prior to confirming the final siting of project components, in accordance with territorial guidance and the recommendations of the Government of Nunavut (GN) (1993). These investigations will guide project design to avoid culturally important areas and support the protection of heritage resources.

2.1.4 Land Use Compatibility

The INP is located on the Kuugaaluk River system, approximately 60 kilometres (km) northeast of Iqaluit, within the Qikiqtaaluk Region of Nunavut (**Figure 1**). Preliminary review of the NLUP indicates that the Project location is situated primarily within lands designated for resource development and general use, with no overlap with protected areas or special management. The Project is not within Inuit Owned Lands, Territorial or National Parks (**Figure 6**). **Figure 7** shows the proposed permanent components associated with the hydroelectric facility, including the dam, reservoir, powerhouse, access road, transmission line, substations, and related infrastructure, as well as the proposed access and transmission routes; however, final route selection and alignment will be determined following completion of investigative studies, engineering review, environmental fieldwork, and engagement.

On February 2, 2026, the Nunavut Planning Commission (NPC) completed its review under NuPPAA and determined that the Project is located outside the boundaries of any applicable regional land use plan. Consequently, the project's conceptual design and land-use requirements proceed without conflicting with any active NLUP designations.

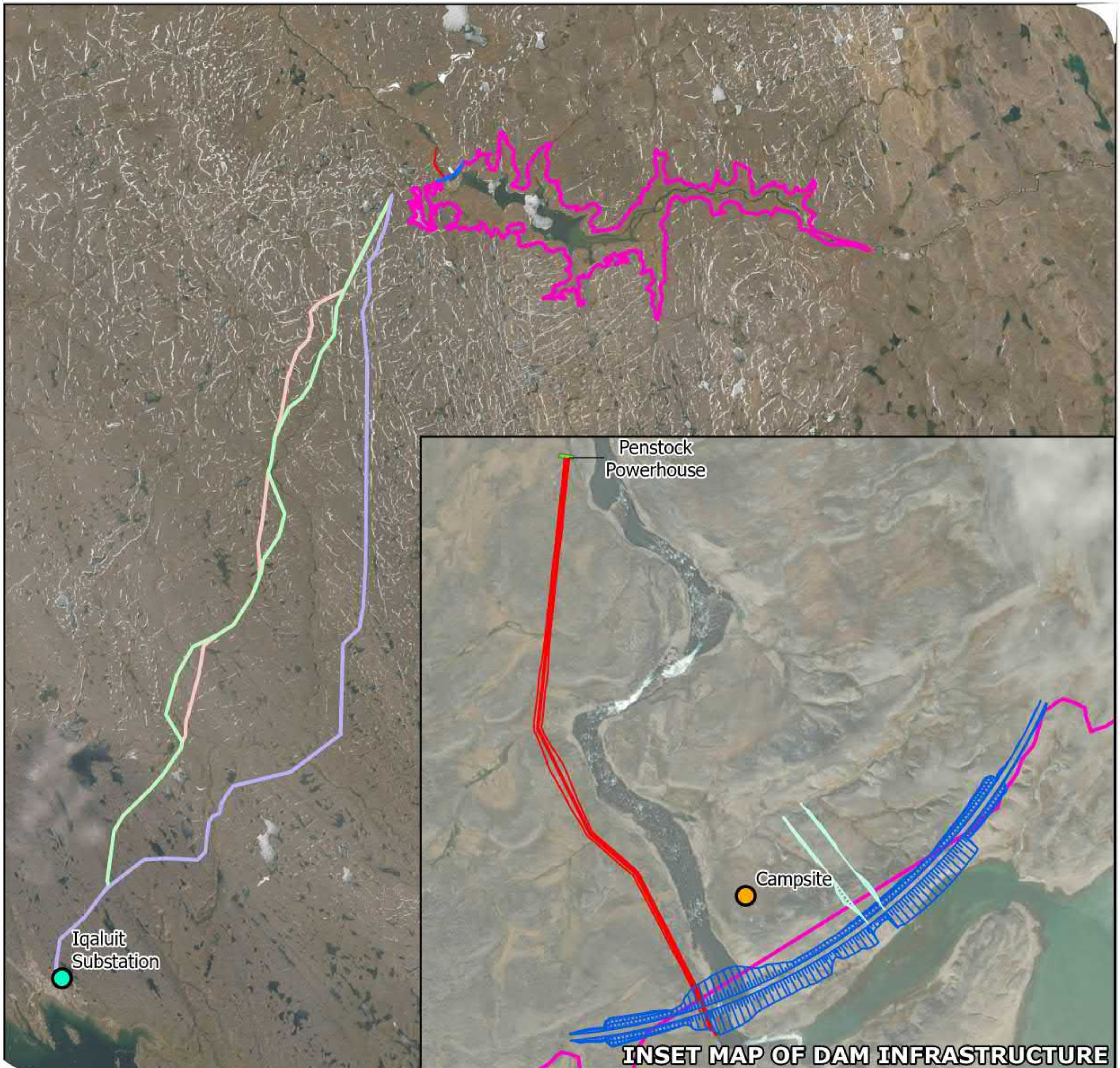
Table 6 summarizes the compatibility of major project components with applicable NLUP zones and designations.

Table 6: Compatibility of Major Project Components, Locations, Applicable NLUP Zones and Regulations

Project Components	Location/Land Tenure	NLUP Zone Classification	Compatibility Summary
Hydroelectric Facility (Dam, Spillway, Powerhouse)	Kuugaaluk River System, Qikiqtaaluk Region	Mixed Use	Compatible with permitted resource and infrastructure development uses. No conflicts identified.

Project Components	Location/Land Tenure	NLUP Zone Classification	Compatibility Summary
Reservoir Area	Within Kuugaaluk River system watershed	Mixed Use	Compatible with permitted resource and infrastructure development uses. Water-level changes will be managed under territorial and federal authorizations.
Access Roads and Quarry Sites	Between Kuugaaluk River system site and Iqaluit corridor	Mixed Use (with a small portion adjacent to limited land use zone)	Compatible with infrastructure corridors permitted for resource and community access.
Transmission Line (to Iqaluit Grid)	Twinned along final access alignment to Iqaluit	Mixed Use	Compatible; no overlap with protected or restricted areas. Route refinement will avoid sensitive habitat.
Temporary Camps and Staging Areas	Near Kuugaaluk River system site on QIA-managed lands	Mixed Use	Compatible subject to land-use authorization. No conflicts identified.

Based on current design information, the INP is compatible with the objectives of the NLUP and supports sustainable development consistent with territorial and community priorities. Final confirmation of conformity will be documented through the NPC review process under the *NuPPAA*.



NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

CONSOLIDATED LAYOUT

FIGURE 7

- Iqaluit Substation
- Campsite
- Dam
- Spillway
- Penstock Pump Line
- McKeand S - Main Access Road - Direct
- McKeand S - Main Access Road - Flatter
- McKeand S - Main Access Road - High
- Penstock Powerhouse
- Main Reservoir

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DILLON CONSULTING

N W E S

SCALE 1:322,403

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2.2 Ancillary Infrastructure Improvements

Several infrastructure improvements will be required to support the main scope of the project. These scopes of work likely will not be executed directly by the Project Owner (NNC); however, would be established via contributions agreements with the relevant parties such as the City of Iqaluit (the City) and the Iqaluit Port (the Port). These scopes will support project construction and logistics while providing lasting community improvements.

Ancillary infrastructure improvements could include:

- Upgrades to the port to support additional offload capacity and laydown space;
- Road improvements between the Port and the City;
- Intersection improvements within the City along the designated transport route; and
- Permanent housing units within the City.

Details of the scope for the ancillary infrastructure will be determined via ongoing studies and stakeholder engagement.

3.0 Project Development Schedule

The Project development schedule is preliminary and will be refined as regulatory review, engineering, engagement, procurement, and construction planning advance. The schedule presented below is based on current planning assumptions and does not prejudge the outcome or timing of NPC conformity review, NIRB screening, any further NIRB Review or Project Certificate process if required, Nunavut Water Board licensing, land use permitting, or other required authorizations.

If the Project receives the required regulatory approvals and authorizations, construction is currently expected to occur over approximately three construction seasons, followed by reservoir filling, commissioning, and transition to commercial operation. The current screening-level schedule assumes construction could begin as early as summer 2028, subject to regulatory approvals, final design, contractor readiness, seasonal access, procurement, and NNC direction.

For planning purposes, the construction sequence is currently anticipated as follows:

- Year 1 – Mobilization and early works: mobilization, logistics setup, temporary access where authorized, construction camp establishment, laydown areas, and initial all-season access road construction.
- Year 2 – Major civil works: borrow and quarry development, continued access road construction, dam foundation preparation, intake works, powerhouse construction, and supporting site infrastructure.
- Year 3 – Headworks and electrical works: river diversion through intake works, dam and spillway completion, penstock installation, powerhouse completion, transmission line construction, and substation construction.
- Year 4 – Reservoir filling and commissioning: reservoir filling, system testing, commissioning, operational readiness activities, and transition to commercial operation.

The indicative schedule is summarized in **Table 7**. Dates are provided for screening and planning purposes only and may be revised as Project planning advances.

Table 7: Preliminary Schedule of Project Activities

Project Phase	Project Activity	Indicative Timing	Duration / Status
Pre-Construction	Consultation and engagement	2023 onward	Ongoing throughout planning, assessment, permitting, construction, and operations
Pre-Construction	Preliminary design	2024 onward	Ongoing; to be refined through investigative studies and engineering review
Pre-Construction	Environmental and regulatory review	2024 onward	Ongoing; includes NIRB, NWB, land use, and other applicable regulatory processes
Pre-Construction	Geotechnical drilling and investigative studies	Q3 2026 onward	Planned / ongoing, subject to applicable permits and field conditions
Pre-Construction	Detailed design	Indicatively Q2 2027 to Q1 2028	Subject to regulatory review outcomes, field study results, and NNC direction
Pre-Construction	Construction contracting and procurement	Indicatively Q4 2027 onward	Subject to approvals, funding, procurement strategy, and contractor availability
Construction	Mobilization and early works	Indicatively summer 2028	Includes logistics setup, temporary facilities, laydown areas, camp establishment, and early access works
Construction	Access road, camp, and site development	Year 1 of construction	Includes all-season access road construction, construction camp, laydown areas, and environmental controls
Construction	Borrow development and major civil works	Year 2 of construction	Includes borrow/quarry development, dam foundation preparation, intake works, powerhouse construction, and supporting infrastructure
Construction	Dam, spillway, penstock, powerhouse, transmission, and substations	Year 3 of construction	Includes completion of major headworks, river diversion through intake works, penstock installation, powerhouse completion, transmission line, and substations

Project Phase	Project Activity	Indicative Timing	Duration / Status
Commissioning	Reservoir filling and plant commissioning	Year 4, indicatively 2031	Subject to approved reservoir filling plan, flow release requirements, monitoring, testing, and regulatory conditions
Operations	Commercial operation	Following commissioning	Subject to successful commissioning, operational readiness, approvals, and grid integration

This schedule will be updated as the Project advances. Any material changes to the construction sequence, timing, water use, reservoir filling, access approach, or Project footprint will be communicated to NIRB and applicable regulators before the affected activity advances.

4.0 Project Description and Activities

The sections that follow present additional detail on the Project components, including the basis of their design, expected construction methods, as well as plans for operations, maintenance, and eventual decommissioning and closure.

4.1 Site Characteristics

4.1.1 Site Selection

The Project was selected by Iqalungmiut, who participated in NNC's engagement events, as the preferred option among several alternatives for providing long-term power supply with limited environmental and socioeconomic impacts. The site was selected due to its natural high-banked narrows in the river, which provides an ideal location for a dam in combination with an upstream storage reservoir. The reservoir portion allows seasonal inflows to be stored and managed to provide a reliable electricity source for the City of Iqaluit over the next 50+ years on a year-round basis. Detailed environmental screening and potential impacts on traditional lands uses and/or historical resource sites will be completed as the Project progresses. The site investigations are underway with major site activities being done in summer of 2026. Land use and Project impacts will be reviewed with rightsholders and stakeholders.

4.1.2 Geological Setting

The Project site is located at the ancient extents of the Frobisher Glacier margin. The site is characterized by terminal moraines deposits of fine-grained material including silts, sands, and gravels. Where not covered by thick glacial deposits, there are regions of exposed bedrock and veneers or blankets of glaciolacustrine deposits.

The presence of permafrost and subsurface ice to about 80 metres depth throughout the site poses additional Project challenges that will be addressed in the design process.

4.2 Power and Energy

For the purpose of this Project Proposal, the hydroelectric facility is described on the basis of an installed generating capacity of up to 30 MW. This is the screening basis for assessing the proposed Project footprint, major infrastructure, water management requirements, and potential environmental and socio-economic interactions. Preliminary power and energy modelling includes both 15 MW and 30

MW operating cases. These operating cases are used to understand reservoir performance, available flows, seasonal generation potential, and operating constraints. The 30 MW installed capacity does not represent continuous firm generation under all hydrologic conditions.

4.2.1 Water Supply

Based on the synthetic hydrologic record developed for the Project, the estimated annual average inflow is approximately 41.1 m^3/s, equivalent to approximately 1,294.7 Mm^3/year. Preliminary modelling indicates that this exceeds the estimated flow required for the 15 MW operating case, which is approximately 27.7 m^3/s, or approximately 873,547,000 m^3/year. The 15 MW operating case is therefore useful for assessing a lower, more continuous generation scenario under preliminary hydrologic assumptions. The proposed 30 MW installed capacity represents the screening basis and maximum design envelope. Preliminary modelling indicates that the 30 MW plant configuration could operate at an estimated capacity factor of approximately 49%, with output varying based on reservoir storage, inflow conditions, environmental flow requirements, demand, maintenance, and operating rules.

4.2.2 Energy Production

The Project will operate as an impoundment reservoir. The electricity is to be supplied to Qulliq Energy Corporation (QEC) who are expected to accept the energy as provided. Currently the QEC power plant does not coordinate its output with other plants.

Power and energy for the Project was determined based on following parameters:

- Francis-type turbines;
- Efficiencies and operating limits based on turbine supplier bid on previous projects;
- Assumed no lost generation revenue due to plant shutdown; and
- Conveyance system head loss include friction head loss, and minor head loss due to bends, contraction, and expansion.

Table 8 provides a summary of the calculated power and energy characteristics for the preliminary operating cases assessed to date. The estimated values are based on preliminary assumptions and do not represent final firm energy commitments. The 30 MW configuration represents the proposed installed capacity and maximum screening basis. The 15 MW case provides a lower operating scenario for evaluating water availability and continuous generation potential. Under the preliminary modelling, the 30 MW configuration has a lower estimated capacity factor than the 15 MW case because higher flow demand, head loss, reservoir refill limitations, environmental flow requirements, and seasonal low-flow conditions affect the amount of time the plant can operate at full output. Further details on power and energy estimates based on Iqaluit demand, hydrologic monitoring, reservoir operation, and environmental flow requirements will be provided as part of future design and licensing.

Table 8: Power and Energy Summary

Parameter	Value	Units
One or Two Turbines Capacity	Up to 30	MW
Maximum Plant Flow	71.5	m^3/s
Minimum Plant Flow	6.6	m^3/s
Number of Units	Up to 2	
Rated Turbine Efficiency	88	%
Normal Headwater Elevation	550.0	m
Normal Tailwater Elevation	480.0	m
Gross Head	70	m
Headloss at Maximum Flow	10.3	m
Electrical Efficiency	97	%
Lost-Generation Downtime	2.0	%
IFR	1 to 4	m^3/s
Average Annual Energy	123	GWh
Capacity Factor*	49	%

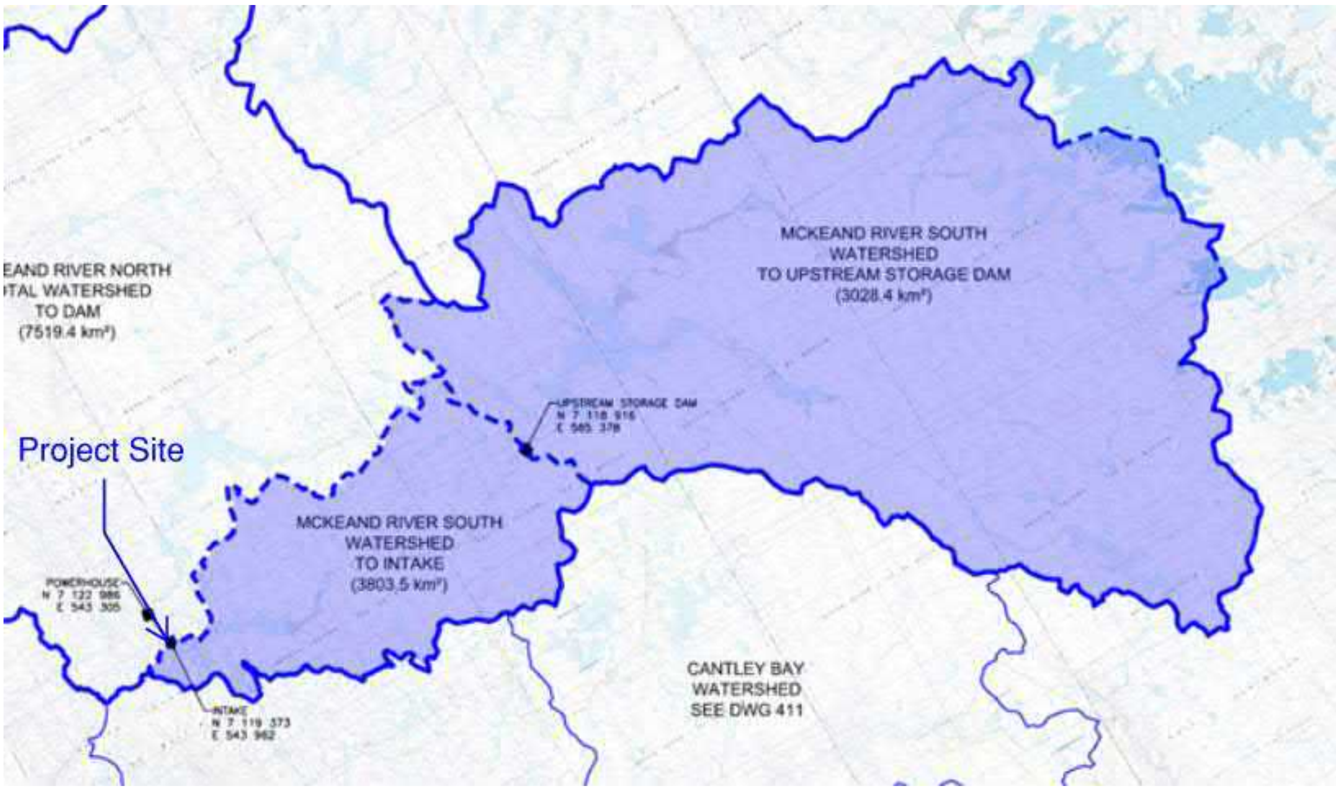
Power generated from the Project facility will be sold to QEC on an accepted as produced basis.

4.3 Water Availability

4.3.1 Watershed

The Kuugaaluk headwaters lie east of the Project in the Hall Peninsula Ice Cap. Upstream of the Project site, the river flows east to west before turning north and eventually discharging into the ocean at Cumberland Sound. The Project drainage area is approximately 3,804 km^2.

Figure 8: Project Drainage Area



4.3.2 Project Flow Estimates

Historical flow records for the Kuugaaluk near the Project site are sparse. As a result, a synthetic flow record was derived using available daily flow records for the Kuugaaluk, transposing the river specific records to the Project site, and combining those records with a regression-based transposition of 44-years of flow data from the Iqaluit Kuunga (also known as Sylvia Grinnell). Additional details of the synthetic flow record development are provided in the Project Design Basis.

4.3.3 Intake Flow Estimates

River flows in the Iqaluit region show seasonal variation with peak monthly flows being observed in June through August each year. The months of December through May are characterized by very low flows or even 'zero' flow days. Daily records showing zero could mean that the watercourse is frozen to the bed or is due to the inability of regional hydrometric stations to capture accurate flow rates during periods of ice cover. **Table 9** illustrates the seasonal flow variations observed in the synthetic flow record.

Table 9: Estimated Mean Daily and Monthly Flow Volumes

*Mm^3 – Millions of Cubic Meters

Month	Mean Daily Flow (m^3/s)	Estimate Inflow Volume (Mm^3)
Jan	0.2	0.7
Feb	0.1	0.2
Mar	0.0	0.1
Apr	0.0	0.0
May	0.1	0.2
Jun	109.5	283.8
Jul	197.8	529.9
Aug	91.4	244.8
Sep	65.3	169.2
Oct	19.6	52.6
Nov	4.5	11.6
Dec	1.0	2.6
Annual Average	**41.1**	**1,294.7**

Satellite imagery from Google Earth and early site reconnaissance suggests that the upstream extent of the Kuugaaluk drainage area could be frozen through much of the year. As a result, water availability might be slightly less than estimated through the development of the synthetic data set which is based largely on the Iqaluit Kuunga River.

Alternatively, should future average temperatures in this region increase, the water availability could be higher than anticipated. The design engineer has arranged for the installation of a Project-specific hydrometric station immediately downstream of the proposed main dam as well as a weather station on site. This hydrometric station would provide real-time flow monitoring specific to the river at the Project site and subsequently improve our estimates of total water availability while also providing data specific base flows for the river.

4.3.4 Low Flow

During concept design, a routing model was developed for the three (3) lowest flow years on record, according to the source river data (1980 - 1982, inclusive). The results of this preliminary analysis suggest that projected inflows to the reservoir, combined with available reservoir storage, may support operation of the proposed facility through most periods; however, the 30 MW installed capacity is not expected to operate at full output under all hydrologic conditions. During longer seasonal low-flow periods, operations may need to be adjusted to maintain reservoir levels, meet instream flow release requirements, and manage downstream discharge. The final operating regime will be refined through additional hydrologic monitoring, reservoir modelling, aquatic assessment, Inuit engagement, and Nunavut Water Board licensing. Thus, water will continuously be discharged into the Kuugaaluk downstream of the powerplant throughout the year.

Operations would need to be adjusted during longer seasonal low-flow periods for the 30 MW system where full-time 30 MW demand could exceed water availability about 20% of the time over a synthetic '3-year low flow' period.

4.3.5 Floods

For typical seasonal flows, including freshet, water is expected to spill over the spillway weir during the months of July through November such that average daily flows immediately downstream of the powerhouse will range from 25 m^3/s to 115 m^3/s when the spillway is activated.

Flood estimates are required to understand the impact of flood flows on the reservoir level and to size the Project spillway. Currently there is no flood data for the Kuugaaluk intake location, so flood estimates were derived indirectly.

Flood flows for the Kuugaaluk at the Project site were estimated by developing a regional flood hydrology using two WSC stations at Iqaluit Kuunga and Apex rivers. The inflow hydrograph for the upper and main reservoir was generated by scaling a representative flood event for the Kuugaaluk. The upper reservoir inflow hydrograph was routed through the reservoir and the downstream reach before entering the main reservoir. This was combined with the direct inflow hydrograph to the main reservoir and was used for flood routing and sizing the spillway and other hydraulic components. **Table 10** summarizes the peak flood flow estimates for various return periods.

Table 10: Peak Flow Estimates

Return Period	Peak Flow Estimate (m^3/s)
1000	1070
200	887
100	812
20	643

4.3.6 Ice

The ice regime at the Project site has not been well observed yet; however, lakes and ponds in the region are expected to be fully ice-covered by late October or early November. Similarly, the Kuugaaluk is assumed to be completely frozen by January.

Ice core data from Environment and Climate Change Canada (ECCC) shows regional thicknesses ranging from 0.4 m to 1.8 m. ECCC lake ice thickness records suggest maximum ice thickness for lakes at similar latitudes peaks at or near 1.7 m.[1] A portion of reservoir storage will be sequestered in the ice cover by the end of winter, necessitating the consideration of seasonal water availability and ice loads for the Project's structural design.

Spring flows typically increase in late-May and peak in late-June or early-July. The open-water season typically extends from May to October.

4.3.7 Instream Flow Release (IFR)

The design capacity of IFR is currently assumed at ~10% of seasonal flows based on the synthetic data set. However, IFR requirements will be determined as part of the environmental assessment for the Project. Further environmental assessment is underway, and final values are to be confirmed.

4.4 Physical Components

4.4.1 Headworks

The Headworks are located downstream of a small set of falls at the outlet of a natural lake on the South Branch of the Kuugaaluk. This Project will increase the storage capacity of the existing lake.

[1] Government of Canada. 2025. "Lake Ice Database." Environment and Climate Change Canada. Accessed March 6, 2025. https://data-donnees.az.ec.gc.ca/data/water/scientificknowledge/lake-ice-database/?lang=en.

The Headworks consist of the main dam, low-level outlet system (LLO works) for construction bypass and instream flow releases, intake with inlet channel to convey flow the hydro plant, and spillway for flood passage and excess flow release. The current design provides 3 m of freeboard above the full supply level elevation of 550 m. Freeboard is provided to reduce the risk of overtopping and to protect Project structures during wave runup, reservoir setup, and the passage of flood flows. The Headworks site and structure configuration are shown on the drawings in **Appendix A**.

4.4.1.1 Main Dam

At concept design for the main dam is a rockfill / earth fill embankment with sheet pile core and a frozen foundation base on top of the existing permafrost and ice filled moraine and bedrock.

The details of the final configuration will depend on confirmation of the sub-surface conditions from the geotechnical drilling program in the summer of 2026 and confirmation of the quality of onsite materials for use of rockfill and/or earth fill embankment. The maximum dam height will be approximately 50 m and, although the dam configuration has yet to be finalized, the total crest length of the dam, including abutments, could be 1700 m to 1800 m long.

The Dam will include a thin upstream semi-impervious core layer (self sealing), erected sheet piles mounted on a soil plinth base or concrete plinth imbedded in bedrock, a modest grout curtain, drains, and a downstream frozen core connected to the existing bottom horizontal frozen base foundation. A series of vertical thermosyphons at ~10m spacing will be paced immediately along the sheetpile to maintain the downstream core and foundation base frozen once the reservoir water is impounded. The spillway will be a concrete lined spillway leading to a rock cut stilling basin. The spillway will be about 75 m wide and 150 m long, with under slab drainage, insulation and thermosyphons to maintain the existing frozen ground beneath it.

Riprap will be placed on the upstream face of the dam and on downstream channel sections to protect against erosion from waves and discharges from the reservoir.

4.4.1.2 Reservoir

At full supply level (FSL, elev: 550 m) the reservoir will be 4 km to 8 km wide and approximately 29 km long, covering approximately 7,136 ha based on current design-basis inundation mapping. The minimum operating level is 528 m, resulting in a total drawdown of 22m. The resulting live storage volume is approximately 1,091,703 dam^3 or 1,100-million m^3.

The reservoir will be operated to capture peak flows from the freshet targeting Full Supply Level (FSL) during the summer. As flows decrease starting in August, reservoir levels will begin to fall reaching near but usually above the minimum operating level by early June the following year.

At FSL, the shoreline perimeter is approximately 150 km. The water level will fluctuate during operations and, given preliminary models for 15 MW of initial years demand, water levels will typically fluctuate 3.7m on average as determined from the 41-years of power and energy modelling. This is based on the assumption of infinite load demand. Further details based on the actual demand for the City of Iqaluit will be provided as part of the design process.

4.4.1.3 Intake and LLO Works

Both Intake and LLO works will be housed adjacently in the same concrete well structure on the left abutment of the main dam.

The intake works convey flow from the reservoir into the penstock to the powerhouse to produce power. For the hydropower Intake, a short rock cut inlet channel leads to the portal entrance where the concrete intake structure is located. A rail system from the intake structure inlet pipe will be used to accommodate lifting of the trash rack for removal of debris during routine maintenance. With the intake arrangement and depth (~38 m), and limited vegetation upstream of the Project it is expected that there will be minimal debris to manage during operations.

A low-level outlet system (the LLO works) will provide a temporary bypass for inflows to the Project site during construction. When complete, the LLO works will pass the required Instream Flow Release (IFR) to the river channel downstream of the dam.

A headworks controls building mounted on top of the gate wells at the dam crest will provide control and maintenance access to Intake and LLO gate systems.

4.4.1.4 Spillway

An overflow spillway will be incorporated into the right dam abutment. It is expected that the spillway will only be activated intermittently, and it will be designed to pass the design flood according to the final dam classification (as per CDA Guidelines). The spillway width will depend on the final dam configuration and be subject to any controls systems that might be implemented to optimize the spillway discharge capacity and storage capacity for the reservoir (e.g., rubber weir to control spillway discharge elevation).

4.4.2 Penstock

The penstock will be either a large diameter steel pipe with welded joints or dual HDPE pipes each capable of handling the power flow requirements for the turbines. The HDPE option has the advantage of much fewer joints, no need for corrosion protection and simpler installation but requires two pipes and some additional footprint.

The penstock connects to the Headworks intake gate well. The penstock within the dam will be a single steel conduit concrete cased and founded on bedrock through the embankment.

For the single steel penstock option, the pipe will continue downstream in a shallow trench on an insulated cradle and be fully buried in an earth mound to provide support and protection. At the powerhouse a bifurcation will be installed to direct flow to each turbine.

For the dual HDPE option, a bifurcation will be installed at the dam toe and then the parallel HDPE pipes will similarly be placed in a shallow trench on an insulated cradle and fully buried in an earth mound to provide support and protection. At the powerhouse each penstock will connect to their respective turbine.

4.4.3 Powerhouse

Two horizontal Francis turbines are proposed for the powerhouse; however, the final turbine selection will be made as the design details are progressed. Francis turbines provide an economical and operationally simple hydropower option that functions well over a wide range of head and flow regimes. The powerhouse and building layout are shown in **Appendix A**.

A concrete foundation will be installed below grade, insulated with thermosyphons to maintain native frozen ground. The submerged turbine draft tubes will discharge to the tailrace which discharges into the Kuugaaluk downstream of the dam. A small control weir in the tailrace may be required to sustain minimum operation depths for the turbine.

The powerhouse building structure will be modular to facilitate transportation to site and ultimately construction. The powerhouse building is a well-insulated, metal clad building with a metal roof. A hoist and bridge crane system will be installed to facilitate installation of the powerhouse components and used for maintenance work over the life of the Project. Overhead access doors will allow removal of heavy equipment if required.

The electrical and control rooms will be a self-contained skid building set inside the powerhouse. Power generated from site will be connected to an onsite substation prior to being transmitted to Iqaluit.

4.4.4 Substation and Transmission

The transmission line arrangement for the Project includes a 66 km, 69 kV line will be twinned with, and generally follow, the final selected all-season access road alignment. Transmission line specifications are to be confirmed but will be selected to provide efficient electrical transmission with minimal system losses while incorporating compatibility with existing systems in Iqaluit. The routing and arrangement, including substations are subject to the requirements of QEC, discussions with the Territorial Government, and the public consultation process. It is anticipated that a receiving substation near the existing diesel powerplant will facilitate interconnection with the existing distribution substation for Iqaluit.

4.4.5 Access Road

Should the Project proceed with the consent of Iqalungmiut, a ~66 km site access road will be constructed from Iqaluit to the Project site. It is anticipated the permanent access road will be constructed at the outset of the Project and some temporary winter roads will be required for construction access as well.

The final route selection will include:

- Incorporation of the needs and desires of rightsholders and stakeholders in Iqaluit;
- Incorporation of natural ridges to avoid valley vegetation and water crossings where possible;
- Onsite access roads would be constructed to the powerhouse and across the main dam, and spillway. A single lane bridge will be constructed to provide access across the spillway; and
- Road construction comprises traditional rock quarries, gravel crushing, and hauling of fill materials. Some in-situ rock excavation along the route will be done to smoothen the alignment, minimize quarry sizes and reduce material hauling.

Access road width and height will be dependent on detailed engineering. Access road driving surface width will likely be between 6 and 9 meters, narrowing at bridges and possibly in some terrain to minimize disturbance.

A logistics study is currently underway to determine the details for infrastructure upgrades and air access support.

4.4.6 Land Infrastructure

To minimize the project's overall physical footprint, the granular materials required for the dam and engineered fill will be sourced locally via onsite aggregate crushing and quarry development, primarily utilizing morainal and till deposits located directly within the future reservoir inundation zone (**Figure 10**).

To execute these major civil works and establish the reservoir, logistics and access must be carefully sequenced. Based on the preliminary design basis, the proposed reservoir has a Full Supply Level of 550 m, a Low Supply Level of 528 m, total storage of approximately 1,391,033 dam^3, and live storage of approximately 1,091,703 dam^3. These values remain preliminary and will be refined through bathymetry, hydrologic modelling, geotechnical investigations, engineering design, and regulatory review.

It is important to note that all outlined construction methods, staging, and sequencing are currently conceptual and provided primarily to support preliminary environmental assessments and regulatory reviews.

4.4.7 Worker Accommodation

Temporary camps will be established to support both ongoing investigative programs and future construction activities. At this stage, camp infrastructure is anticipated to include a temporary construction camp accommodating approximately 50 personnel. Camp facilities may include accommodation units or tents, kitchen and dining areas, sanitary facilities, fuel storage, waste storage, communications systems, laydown and staging areas, and supporting power and water servicing infrastructure. Final camp locations, layouts, servicing requirements, and duration of use will be confirmed through ongoing engineering, field investigations, and regulatory review.

4.4.7.1 Construction Camp

The construction camp, planned near the main dam site, will support the workforce during construction and reduce reliance on daily flights. It is expected to include accommodations, food services, water and wastewater systems, waste handling, fuel storage, maintenance and laydown areas, power, communications, and emergency response equipment. Camp locations and layouts will be refined through engineering, field studies, IQ, archaeological review, terrain assessment, and regulatory input to support access while minimizing environmental and cultural disturbance.

Camp operations will be managed through standard environmental protection measures, including fuel handling controls, secondary containment, waste segregation, wastewater management, wildlife attractant control, spill response, and site cleanup and restoration following demobilization. No permanent operations camp is currently proposed, as long-term operations are expected to be managed primarily from Iqaluit.

Worker accommodation is required for a capacity of approximately 60 to 90 persons, depending on the final construction schedule, contractor staffing requirements, and execution strategy. Camp accommodation is currently expected to be established as early as 2028 and remain in operation until approximately summer 2031 subject to regulatory approvals, final design, contractor readiness, seasonal access, procurement, and NNC direction.

Currently, an on-site construction camp area is being considered which is estimated to occupy approximately 3 hectares near the current temporary camp location; however, the final area, layout, and location will be confirmed as engineering design, environmental studies, logistics planning, and regulatory review advance.

The on-site construction camp would include the facilities required to support temporary accommodation and construction operations at the Project site. These may include worker accommodation, kitchen and cafeteria facilities, potable water supply, wastewater collection and treatment, solid waste management, power supply, fuel storage, maintenance and storage facilities, communications, emergency response facilities, and other supporting services. Details of the proposed camp infrastructure have not been defined at this stage of Project development.

Water supply, wastewater management, solid waste management, fuel storage, and power supply systems will be designed, operated, and maintained in accordance with applicable regulatory requirements, permits, approvals, and accepted industry practices. Wastewater and solid waste generated at the camp will be managed to minimize potential effects on water quality, wildlife, fish habitat, vegetation, terrain, and public health. Fuel and hazardous materials associated with camp operation will be stored and handled using appropriate containment, spill prevention, inspection, and spill response measures.

The camp will be operated in a manner intended to limit interactions between workers and wildlife, reduce potential attractants, and maintain safe and orderly site conditions. Camp procedures are expected to address waste handling, wildlife awareness, traffic control, fire prevention, emergency response, worker orientation, and environmental protection requirements.

Most on-site camp facilities are expected to be temporary and will be removed following completion of construction. A portion of the camp infrastructure may be retained to support long-term operation and maintenance of the hydroelectric facility.

On-site permanent recluse facilities may include limited emergency accommodation, maintenance or storage buildings, utilities, and related support infrastructure required for safe and reliable operation of the Project.

The final camp design, operating requirements, environmental protection measures, and reclamation requirements will be developed during subsequent phases of Project planning and will be subject to applicable regulatory review and approval.

4.5 Construction

Construction activities include but are not limited to:

1. Site preparation and grading.
2. Clearing, grubbing, and stripping of overburden.
3. Surveying and construction layout.
4. Excavation of soil, overburden, and bedrock.
5. Drilling and blasting.

6. Quarrying, aggregate production, crushing, and screening.
7. Hauling and transportation of materials and equipment.
8. Placement and compaction of fill materials.
9. Foundation preparation and rock treatment.
10. Construction dewatering and water management.
11. Installation of temporary works and erosion control measures.
12. Concrete batching, transportation, placement, and curing.
13. Cast-in-place concrete construction.
14. Precast concrete installation.
15. Structural steel fabrication and erection.
16. Pipe fabrication, welding, and installation.
17. Installation of mechanical and electrical equipment.
18. Utility and communications installations.
19. Transmission line and electrical infrastructure construction.
20. Equipment testing, commissioning, and start-up activities.
21. Site restoration and reclamation of temporary work areas.

During construction, the Project is expected to employ approximately 50 personnel during typical construction periods, with peak workforce requirements of up to approximately 90 personnel depending on final schedule, contractor staffing, and execution strategy. Construction is currently expected to occur over multiple seasons between approximately late 2028 or early 2029 and summer 2031, subject to permitting, final design, contractor planning, seasonal access constraints, and construction sequencing.

4.5.1 Project Requirements During Construction

Table 11 provides the current screening-level construction requirements for the Project. Values are preliminary and are intended to support NIRB screening. Final contractor-specific quantities, equipment selections, construction methods, storage configurations, and operating procedures will be refined through detailed design, contractor planning, Nunavut Water Board licensing, land use permitting, and other applicable regulatory review before construction.

Table 11: Screening-level Construction Requirements

Requirement	Current Screening Basis
Construction period	Approximately late 2028 or early 2029 to summer 2031, subject to permitting, final design, contractor planning, seasonal access, and construction sequencing.
Reservoir filling and commissioning	Currently anticipated in 2031, following completion of major civil works, mechanical/electrical installation, system testing, and regulatory approvals.
Typical construction workforce	Approximately 50 personnel during typical construction periods.
Peak construction workforce	Up to approximately 90 personnel during peak construction periods, depending on final schedule, contractor staffing, and execution strategy.
Construction camp	Temporary onsite construction camp near the main dam site, supported by logistics, storage, and staging facilities in or near Iqaluit.
Access	Existing Iqaluit marine and aviation infrastructure, helicopter access, authorized temporary winter access where required, and the proposed approximately 66 km all-season access road once constructed.
Onsite access roads	Approximately 7 km of onsite access roads connecting the powerhouse, dam, spillway, laydown areas, camp, and other Project facilities, subject to detailed design.
Fuel source	Sealift delivery to Iqaluit, followed by road transport to the Project site once suitable access is available. Before completion of the all-season access road, limited fuel may be transported using authorized temporary access methods.
Fuel storage	Temporary fuel storage at the Iqaluit staging area, construction camp, headworks area, laydown areas, quarry or borrow areas, and selected work fronts.
Estimated maximum diesel storage within the Project construction logistics system at one time	Approximately 200,000 L to 450,000 L distributed between the construction camp, headworks area, laydown areas, quarry or borrow areas, and selected work fronts.
Estimated gasoline storage onsite at one time	Approximately 2,000 L to 10,000 L, primarily for small equipment, vehicles, tools, and emergency use.

Requirement	Current Screening Basis
Estimated propane storage onsite at one time	Approximately 10,000 L to 50,000 L water capacity equivalent, primarily for camp heating, cooking, and temporary support facilities.
Estimated Jet A storage onsite at one time	Approximately 5,000 L to 20,000 L, if aviation fuel storage is required for helicopter support. Aviation fuel may alternatively be managed from existing Iqaluit aviation infrastructure.
Water source	Project lake/reservoir area or other approved water source, subject to Nunavut Water Board authorization.
Estimated construction water withdrawal	Typical construction water withdrawal is expected to range from approximately 50 m^3/day to 150 m^3/day, with short-duration peak requirements of up to approximately 500 m^3/day during concrete production, dust suppression, dewatering, or other high-demand construction activities.
Estimated annual construction water use	Approximately 15,000 m^3/year to 75,000 m^3/year, excluding reservoir impoundment and event-based construction dewatering.
Wastewater management	Camp wastewater and greywater will be managed through approved treatment, holding, transport, or disposal methods confirmed through the Nunavut Water Board process.
Waste management	Waste will be segregated and temporarily stored onsite before removal to approved facilities in Iqaluit or other approved disposal locations, as applicable.
Aggregate and borrow	Proposed use of local morainal and till deposits, including material within the future reservoir inundation zone where appropriate.
Explosives	Explosives may be required for rock excavation, quarry development, road construction, and civil works. Storage, transport, and use will follow applicable federal and territorial requirements.
Major equipment	Heavy construction equipment, haul trucks, loaders, excavators, dozers, cranes, concrete batch plant, crushing/screening equipment, generators, fuel trucks, and support vehicles.
Environmental controls	Erosion and sediment control, spill prevention and response, wildlife attractant controls, waste management, water management, dust control, inspections, and adaptive mitigation.

4.5.2 Major Equipment

Construction of the Project is expected to utilize a variety of heavy equipment, construction machinery, and support vehicles typical of hydroelectric, transmission, and transportation infrastructure projects. Major equipment categories may include:

- Excavation equipment, including hydraulic excavators, backhoes, and trenching equipment;
- Earthmoving equipment, including bulldozers, loaders, graders, and compactors;
- Material hauling equipment, including articulated haul trucks, pipe side booms, highway trucks, and trailers;
- Aggregate production equipment, including crushers, screeners, conveyors, and associated quarry equipment;
- Drilling and blasting equipment for rock excavation and quarry operations;
- Concrete production and placement equipment, including batch plants, concrete mixers, concrete pumps, and associated support equipment;
- Lifting and material handling equipment, including mobile cranes, rough-terrain cranes, loaders, forklifts, telehandlers, and hoisting systems;
- Dewatering and water management equipment, including pumps, piping, and temporary water control systems;
- Foundation and ground improvement equipment, including drilling rigs, grouting equipment, and rock treatment equipment;
- Welding, fabrication, and mechanical installation equipment;
- Power generation and temporary utility equipment, including generators, fuel storage systems, lighting systems, and temporary electrical distribution equipment;
- Transmission line construction equipment, including foundation drilling equipment, pole or structure erection equipment, conductor stringing equipment, and associated support vehicles;
- Service vehicles, including pickup trucks, maintenance vehicles, personnel transportation vehicles, and mobile workshops;
- Snow removal and winter maintenance equipment required to support year-round construction operations; and
- Environmental monitoring, survey, and quality control equipment.

The specific equipment used during construction will be determined by the selected contractors and may vary depending on final design requirements, site conditions, seasonal constraints, and contractor means and methods.

4.5.3 Materials and Equipment Staging

Existing port facilities in Iqaluit may be used during the open water season to receive equipment and materials. A temporary staging area may be established near the port to support the movement of materials through town, with an additional temporary staging area proposed approximately 3 km along the access road. These areas will be used to organize, sequence, and manage material transport from the port to the Project access corridor. Final staging locations, footprints, duration of use, traffic controls, environmental protection measures, and applicable approvals will be confirmed before use..

4.5.4 Material Sourcing

The overarching construction strategy for the Project is to strictly limit the need for imported materials. Material sourcing will rely heavily on quarry development and onsite aggregate processing near the proposed dam site. Where possible, borrow sources will be located directly within the future reservoir footprint (the inundation zone); this approach minimizes the project's overall physical footprint, protects undisturbed permafrost, and significantly reduces long-term site reclamation requirements.

4.5.4.1 Borrow Materials and Quantities

Materials will be sourced from locally available morainal deposits (sand and fine gravel), till blankets (fine-grained material), and exposed bedrock. Preliminary geotechnical terrain analysis has identified massive potential borrow volumes near the site, which will be confirmed during the 2026 geotechnical exploration programs. Identified sources include:

- Hard Rock: Four primary areas have been identified, yielding an estimated combined total of over 200,000,000 m^3 of rock suitable for the dam shell and crushing for concrete aggregate; and
- Sands and Gravels: Two primary areas have been identified yielding an estimated 33,000,000 m^3, suitable for penstock backfill and fine concrete aggregate.

4.5.4.2 Application-Specific Sourcing

- Access Roads: To construct the permanent and temporary access roads, granular materials will be sourced from borrow areas adjacent to the road alignment or processed onsite to meet structural requirements. The road design requires a 300 mm thick base course of 125 mm minus granular fill, topped with a 50 mm surface layer of 25 mm minus material;
- Concrete Work (Main Dam, RCC, and Structures): Because aggregate typically comprises 75% or more of concrete by volume, utilizing onsite sands, gravels, and crushed rock for the mix design is critical for efficiency. While the aggregate will be locally sourced, the required cement and specialized concrete additives will need to be imported and shipped to the site; and

- Penstock and Engineered Fill: The 2,000-meter trenched penstock will utilize the locally sourced sands and gravels for backfill, supplemented by high-density structural foam bedding to provide continuous support and insulation against freezing.

4.5.5 Site Support Infrastructure

The construction water-use, waste volumes and fuel-storage quantities provided in this section are screening-level planning estimates developed from the current preliminary design basis, including the proposed hydroelectric facility, approximately 66 km access road, temporary construction camp, headworks construction, quarry and borrow activities, laydown areas, mobile equipment use, temporary power requirements, and construction sequencing. These values are intended to support NIRB screening and do not represent final contractor quantities. Final water-use volumes, waste volumes and fuel storage volumes, tank configurations, withdrawal locations, and management procedures will be refined through detailed design, contractor planning, Nunavut Water Board licensing, land use permitting, and other applicable regulatory review.

4.5.5.1 Water Use

Water will be required during construction for camp use, dust suppression, material compaction, concrete production, equipment washing, aggregate processing, construction dewatering, and other construction support activities. The primary construction water source is expected to be the Project lake/reservoir area or another approved water source, subject to Nunavut Water Board authorization.

For screening purposes, typical construction water withdrawal is expected to range from approximately 50 m^3/day to 150 m^3/day. Short-duration peak construction water requirements may reach up to approximately 500 m^3/day during periods when concrete production, dust suppression, construction dewatering, and other water-demand activities occur at the same time. Estimated annual construction water use is expected to range from approximately 15,000 m^3/year to 75,000 m^3/year, excluding reservoir impoundment and event-based construction dewatering.

Table 12 provides the current screening-level construction water-use estimate. Final withdrawal locations, maximum daily withdrawal volumes, annual volumes, intake screening, water treatment, discharge management, monitoring, and reporting requirements will be confirmed through the Nunavut Water Board licensing process before construction water use occurs.

Table 12: Estimated Water Use

Water Use Activity	Preliminary Screening Basis	Estimated Volume / Range	Proposed Management Approach
Camp potable and domestic water	Water for drinking, food preparation, washing, sanitary use, and camp support services. Estimate is based on a typical 50-person camp and peak accommodation needs of up to approximately 90 personnel.	Typical: 8 m^3/day to 15 m^3/day. Peak: 15 m^3/day to 25 m^3/day.	Treated or managed in accordance with applicable health, camp, and water licence requirements.
Concrete production	Water for concrete batching and civil works, including dam, powerhouse, intake, low-level outlet, spillway, foundations, and related structures.	Intermittent use of approximately 20 m^3/day to 150 m^3/day during active batching periods.	Withdrawn from an approved source; water use tracked and reported as required. Concrete wash water to be managed in designated containment or treatment areas.
Dust suppression	Water for dust control along active construction roads, laydown areas, quarry/borrow areas, and other disturbed surfaces.	Approximately 20 m^3/day to 200 m^3/day during dry, active construction periods.	Applied only where required; managed to reduce runoff and sediment transport.
Material compaction	Water for road construction, fill placement, embankment works, and other compaction activities.	Approximately 10 m^3/day to 75 m^3/day during active earthworks.	Managed to reduce sediment-laden runoff and avoid uncontrolled discharge to waterbodies.
Aggregate processing / crushing support	Water for dust control, aggregate handling, or washing where required.	Approximately 5 m^3/day to 50 m^3/day during active processing periods.	Used within designated areas with sediment control and runoff management.

Water Use Activity	Preliminary Screening Basis	Estimated Volume / Range	Proposed Management Approach
Equipment washing	Water for controlled washing of vehicles and equipment.	Approximately 2 m^3/day to 10 m^3/day.	Conducted in designated areas with sediment and contaminant controls.
Construction dewatering	Water removed from excavations, foundations, or work areas.	Event-based; approximately 50 m^3/day to 500 m^3/day during active dewatering events, depending on location and conditions.	Managed through settling, filtration, energy dissipation, or other approved controls before discharge.
Hydrostatic testing / flushing	Water for testing or flushing of pipes, penstock sections, or related infrastructure, if required.	Event-based; approximately 100 m^3 to 500 m^3 per event.	Water to be reused where practical or discharged in accordance with approved water management procedures.
Reservoir impoundment and filling	Water retained behind the dam during reservoir filling.	Reservoir Full Supply Level: 550 m. Minimum operating level: 528 m. Live storage: approximately 1,091,703 dam^3, or approximately 1,092 million m^3.	Filling sequence, timing, downstream flow management, monitoring, and reporting to be confirmed through engineering, aquatic assessment, Inuit engagement, and NWB licensing.
Operational water use for generation	Water passed through turbines for hydroelectric generation. This is not expected to be a consumptive water use, as water will be discharged downstream through the powerhouse, low-level outlet, and/or spillway.	Maximum plant flow: approximately 71.5 m^3/s. Minimum plant flow: approximately 6.6 m^3/s. For a 15 MW operating case, estimated flow requirement is approximately 27.7 m^3/s, or approximately 873,547,000 m^3/year.	Managed through approved reservoir operating rules, instream flow release requirements, downstream monitoring, and NWB licence conditions.

Water Use Activity	Preliminary Screening Basis	Estimated Volume / Range	Proposed Management Approach
Instream flow release	Priority release to support downstream flow before generation.	Preliminary IFR range: 1 m^3/s to 4 m^3/s. A preliminary summer target of 4.0 m^3/s has been identified for June to August planning purposes.	Final seasonal IFR values to be confirmed through hydrologic analysis, aquatic studies, IQ, engineering, and regulatory review.

The synthetic hydrologic record developed for the Project estimates an annual average inflow of approximately 41.1 m^3/s, or approximately 1,294.7 Mm^3/year. The current Project concept relies on reservoir storage to capture seasonal freshet flows and support year-round generation and downstream flow releases. Reservoir operating rules, discharge management, and monitoring requirements remain preliminary and will be refined through hydrologic modelling, bathymetry, aquatic assessment, Inuit engagement, and Nunavut Water Board licensing.

The above construction-phase water table provides the current screening-level basis for water use, wastewater management, dewatering, hydrostatic testing, construction runoff, and related discharge management during construction. Final water sources, withdrawal locations, daily water volumes, discharge locations, discharge criteria, wastewater handling methods, monitoring parameters, monitoring frequency, compliance points, and reporting format will be developed through detailed engineering, contractor planning, aquatic assessment, hydrologic review, Inuit engagement, and the Nunavut Water Board Type A Water Licence process. The Type A Water Licence application will provide the detailed construction water management, wastewater management, discharge management, and monitoring information required before construction activities proceed.

4.5.5.2 Construction Waste Management

During construction, wastes generated at the temporary camp, laydown areas, construction work fronts, and support facilities will be segregated, stored, handled, transported, and disposed of in accordance with applicable federal, territorial, municipal, and facility-specific requirements. Waste management procedures will be developed in a Project-specific Waste Management Plan before construction.

Domestic waste, food waste, greywater, sewage, non-hazardous construction waste, hazardous waste, and other Project-related waste streams will be managed to reduce the potential for environmental release, wildlife attraction, nuisance odours, and health and safety risks to personnel. Food waste and food-contaminated materials will be stored in wildlife-resistant sealed containers and kept separate from other waste streams. Waste storage areas will be inspected regularly and maintained in a clean and orderly condition.

Where practical, recyclable or reusable materials such as clean wood, metal, plastics, drums, pallets, and packaging will be separated from general waste. Non-hazardous solid waste will be temporarily stored onsite and transported to approved facilities in Iqaluit or another approved receiving facility, subject to facility acceptance requirements.

Greywater and sewage generated at camp facilities will be managed through approved holding, treatment, transport, or disposal methods confirmed through the Nunavut Water Board licensing process and applicable municipal or facility requirements. Untreated sewage or greywater will not be discharged to the land or water unless authorized under applicable permits or licences.

Hazardous waste, including waste oil, lubricants, solvents, glycol, contaminated soil, contaminated snow or ice, batteries, fuel-contaminated materials, used spill response materials, tanks, drums, and other regulated materials, will be segregated from non-hazardous waste. Hazardous waste will be stored in labelled containers compatible with the waste type, placed in appropriate secondary containment where required, and transported by an authorized carrier to an approved receiving facility.

The types of waste expected to be generated during construction are listed in **Table 13**.

Table 13: Estimated Wastes Generated during Construction

Waste Category	Waste Type	Description / Examples	Proposed Management Approach
Domestic waste	Food waste	Biodegradable waste, kitchen waste, food-contaminated packaging	Store in sealed wildlife-resistant containers; remove regularly to an approved disposal facility.
Domestic waste	General camp waste	Paper, packaging, non-food domestic waste, non-recyclable materials	Segregate from food waste and hazardous waste; store in designated containers; transport to approved disposal facility.
Domestic waste	Recyclables / reusable materials	Clean cardboard, plastics, cans, bottles, pallets, clean wood, scrap metal	Separate where practical; reuse, recycle, or transport to approved receiving facility.
Liquid domestic waste	Sewage	Blackwater from toilets and sanitary facilities	Manage through approved holding, treatment, transport, or disposal method confirmed through licensing and facility acceptance requirements.

Waste Category	Waste Type	Description / Examples	Proposed Management Approach
Liquid domestic waste	Greywater	Wastewater from kitchens, washing, showers, and laundry facilities	Manage through approved holding, treatment, transport, or disposal method confirmed through licensing and facility acceptance requirements.
Non-hazardous construction waste	Inert construction materials	Clean wood, metal, plastics, packaging, geotextile scraps, pipe offcuts, non-contaminated construction debris	Segregate and temporarily store in designated areas; reuse, recycle, or transport to approved disposal facility.
Hazardous waste	Petroleum and chemical waste	Waste oils, lubricants, solvents, glycol, hydraulic fluids, oily rags, used filters	Store in labelled compatible containers with secondary containment where required; transport by authorized carrier to approved receiving facility.
Hazardous waste	Contaminated materials	Contaminated soil, snow, ice, absorbents, spill pads, spill response materials	Segregate, containerize, label, and store in a designated controlled area pending transport to an approved receiving facility.
Hazardous waste	Batteries and electrical waste	Batteries, small electronics, electrical components, light bulbs where applicable	Store separately in compatible containers; transport to approved recycling or hazardous waste facility.
Hazardous waste	Tanks, drums, and containers	Empty or residual fuel, oil, chemical, glycol, or hazardous material containers	Inspect, label, and manage based on residual contents; reuse, recycle, return to supplier, or dispose at approved facility.
Special waste	Wildlife attractants	Food-contaminated materials, grease, cooking oils, animal attractant materials	Store in sealed wildlife-resistant containers; remove frequently; manage to reduce wildlife interactions.

4.5.5.3 Fuel Source, Storage, and Containment

Construction-phase fuel is proposed to be delivered to Iqaluit by sealift and transported to the Project site by road once suitable access is available. Fuel required before completion of the all-season access road may be transported using authorized temporary access methods, subject to applicable permits and environmental protection requirements.

Onsite fuel storage is expected to be required at the temporary construction camp, headworks construction area, laydown areas, quarry or borrow areas, selected construction work fronts, and potentially at the helicopter landing area if aviation fuel is stored onsite. Fuel types may include diesel, gasoline, propane, Jet A, lubricants, hydraulic fluids, and other petroleum products required for construction equipment and camp operations.

For screening purposes, **Table 14** summarizes the screening level fuel storage estimates. This total volume accounts for all fuel moving through the supply chain simultaneously and will be distributed across multiple approved storage locations (e.g., camp, headworks, quarry). It does not represent a single remote tank farm or the maximum simultaneous storage at any one specific location. This estimate reflects the remote construction setting, the approximately 66 km access road, the construction camp, headworks construction, quarry/borrow activities, laydown areas, mobile equipment use, and backup power requirements. Final fuel storage volumes and tank configurations will be confirmed through detailed construction planning, contractor fuel-use estimates, applicable permits, and regulatory review before storage is established.

Table 14: Screening-Level Fuel Storage Basis

Proposed Storage Location	Fuel Type	Approximate Maximum Storage Volume / Range	Storage Method	Containment Specification	Separation / Siting Controls
Iqaluit staging / marshalling area	Diesel, gasoline, propane, Jet A, lubricants, hydraulic fluids	Diesel: 100,000 L to 250,000 L. Gasoline: 2,000 L to 5,000 L. Propane: 10,000 L to 25,000 L water capacity equivalent. Jet A: 5,000 L to 20,000 L, if required.	Approved tanks, double-walled tanks, drums, cylinders, or approved containers.	Secondary containment sized in accordance with applicable code and regulatory requirements. Spill kits and inspection controls to be maintained.	Located in an approved staging area with controlled access, spill response equipment, and inspection procedures.

Proposed Storage Location	Fuel Type	Approximate Maximum Storage Volume / Range	Storage Method	Containment Specification	Separation / Siting Controls
Temporary construction camp near main dam site	Diesel, propane, gasoline, lubricants	Diesel: 50,000 L to 100,000 L. Propane: 10,000 L to 30,000 L water capacity equivalent. Gasoline: 1,000 L to 5,000 L. Lubricants/hydraulic fluids: 1,000 L to 5,000 L.	Double-walled tank, enviro-tank, day tank, drums, cylinders, or approved containers.	Secondary containment for tanks and dispensing areas. Backup generator day tanks to be sized for approximately 24 hours of operation and equipped with secondary containment.	Sited away from waterbodies and sensitive areas to the extent practical. Refuelling to occur in designated areas where practical.
Headworks / dam construction area	Diesel, gasoline, lubricants, hydraulic fluids	Diesel: 100,000 L to 200,000 L. Gasoline: 1,000 L to 5,000 L. Lubricants/hydraulic fluids: 2,000 L to 10,000 L.	Temporary bulk tanks, day tanks, mobile fuel units, drums, or approved containers.	Secondary containment, spill kits, inspection program, and transfer controls. High/low-level alarms to be used where applicable.	Located outside active drainage pathways where practical and away from waterbodies to the extent practical.
Quarry / borrow areas	Diesel, lubricants, hydraulic fluids	Diesel: 25,000 L to 75,000 L. Lubricants/hydraulic fluids: 1,000 L to 5,000 L.	Mobile refuelling unit, temporary tank, drums, or approved containers.	Secondary containment for stationary storage and spill response equipment at active work fronts.	Refuelling to occur away from waterbodies where practical and within designated areas.
Laydown areas and selected work fronts	Diesel, gasoline, lubricants,	Diesel: 10,000 L to 50,000 L. Gasoline: 1,000 L to 3,000 L. Lubricants/hydraulic	Approved containers, mobile equipment	Drip trays, secondary containment where	Stored in designated areas with housekeeping

Proposed Storage Location	Fuel Type	Approximate Maximum Storage Volume / Range	Storage Method	Containment Specification	Separation / Siting Controls
	hydraulic fluids	fluids: 1,000 L to 5,000 L.	tanks, mobile fuel unit, or day tanks.	stationary storage occurs, spill kits, and routine inspections.	and inspection controls.
Helicopter landing area / aviation support area, if required	Jet A	5,000 L to 20,000 L if aviation fuel is stored onsite. Aviation fuel may alternatively be managed from existing Iqaluit aviation infrastructure.	Approved aviation fuel drums, double-walled tank, or approved aviation fuel storage system.	Secondary containment, spill response equipment, transfer controls, and inspection procedures.	Located at a designated aviation support area away from waterbodies and sensitive terrain to the extent practical.
Backup generators	Diesel	Approximately 500 L to 2,000 L per generator day tank, depending on generator size and final camp/equipment configuration.	24-hour day tanks or integrated generator tanks.	Secondary containment and high/low-level alarms where applicable.	Located on stable ground within designated generator areas, with spill response equipment nearby.

Fuel storage and dispensing areas will be located away from waterbodies and environmentally sensitive areas to the extent practical. Fuel storage areas will use secondary containment, inspection procedures, spill response equipment, fire safety controls, trained personnel, and emergency response procedures. Refuelling will occur in designated areas where practical. Spill prevention and response procedures will be included in the Project Environmental Protection Plan and Spill Prevention and Response Plan.

The estimates in **Table 14** represent preliminary screening-level storage quantities for NIRB review. Final fuel quantities will depend on contractor equipment selection, construction schedule, generator configuration, access timing, and the extent to which fuel can be staged from Iqaluit versus stored onsite. If final fuel storage volumes or locations materially differ from the screening basis, NNC will provide updated information to NIRB and applicable regulators before those storage areas are established.

4.5.6 Site Access and Aviation Infrastructure

Current year-round access to the Project site is by helicopter, subject to weather and visibility limitations. Winter access may also occur by snowmobile or temporary winter access routes where authorized.

No new permanent fixed-wing airstrip is proposed as part of the current Project configuration. Aviation support is proposed to rely on existing aviation infrastructure in Iqaluit and helicopter access to designated landing areas at the Project site. A helipad or helicopter landing area is proposed within the Project site layout to support construction logistics, emergency response, environmental monitoring, inspections, and long-term operations access.

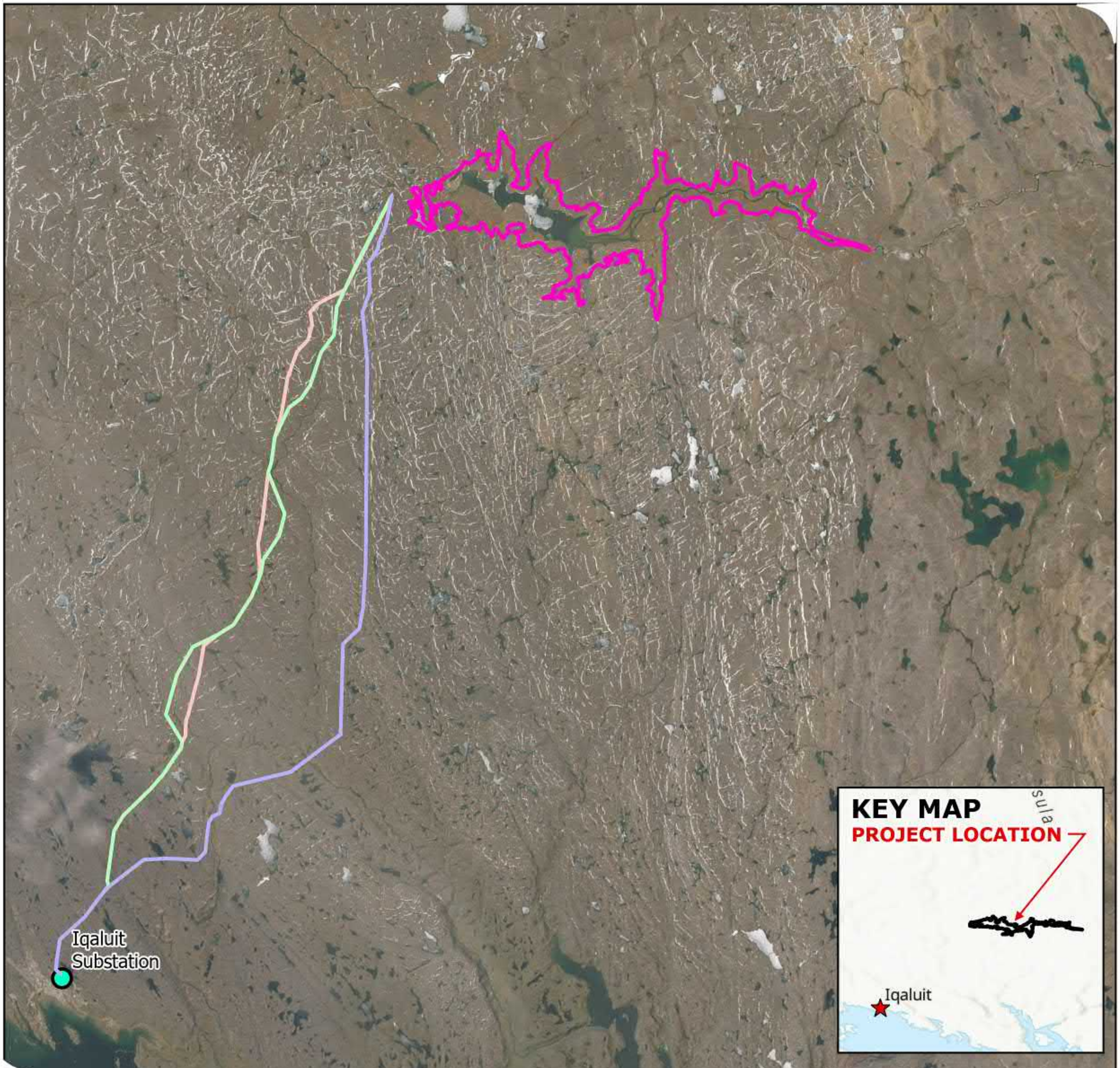
If future engineering or logistics planning identifies a need for a temporary fixed-wing landing strip or other new aviation infrastructure, NNC will provide updated information to NIRB and applicable regulators before advancing that infrastructure.

4.5.6.1 Road Construction

Initial site mobilization will rely on the development of a temporary winter access road built over frozen ground to transport heavy construction equipment. This will be followed by the construction of a ~66 km all-season access road, which will advance from the project site outward toward Iqaluit.

Construction access will rely on a combination of overland, sea, and air logistics. NNC focuses on modular design elements to facilitate transport to the site and construction of the infrastructure.

- Road Access: One final all-season access road route will be selected from the three route options carried forward for screening. The selected route is expected to be approximately 66 km long and would connect Iqaluit to the Project site. The 69 kV transmission line is proposed to be twinned with, and generally follow, the final selected all-season access road alignment, as shown conceptually on **Figure 9**.



NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

ROAD AND TRANSMISSION ALIGNMENT

FIGURE 9

- McKeand S - Main Access Road - Direct
- McKeand S - Main Access Road - Flatter
- McKeand S - Main Access Road - High
- Main Reservoir
- Iqaluit Substation

Note: All structures will maintain a minimum of 3.0m clearance from the road edge. The proposed all-season access road is approximately 66 km from the hydro plant to the new interconnection substation in Iqaluit, the 69 kV transmission line will follow the all-season access road corridor

MAP DRAWING INFORMATION DATA PROVIDED BY: NUNAVUT NUKKIKSAUTIIT CORPORATION, GOVERNMENT OF NUNAVUT, NATURAL RESOURCES CANADA, DILLON CONSULTING LIMITED, ECOLOGIC CONSULTANTS LIMITED

MAP CREATED BY: -EES
MAP CHECKED BY: -MR
MAP PROJECTION: NAD 1983 CSRS UTM Zone 19N

DILLON CONSULTING

N W E S

SCALE 1:322,403

0 2.75 5.5 km

PROJECT: 25-1319
STATUS: DRAFT
DATE: 2026-07-02

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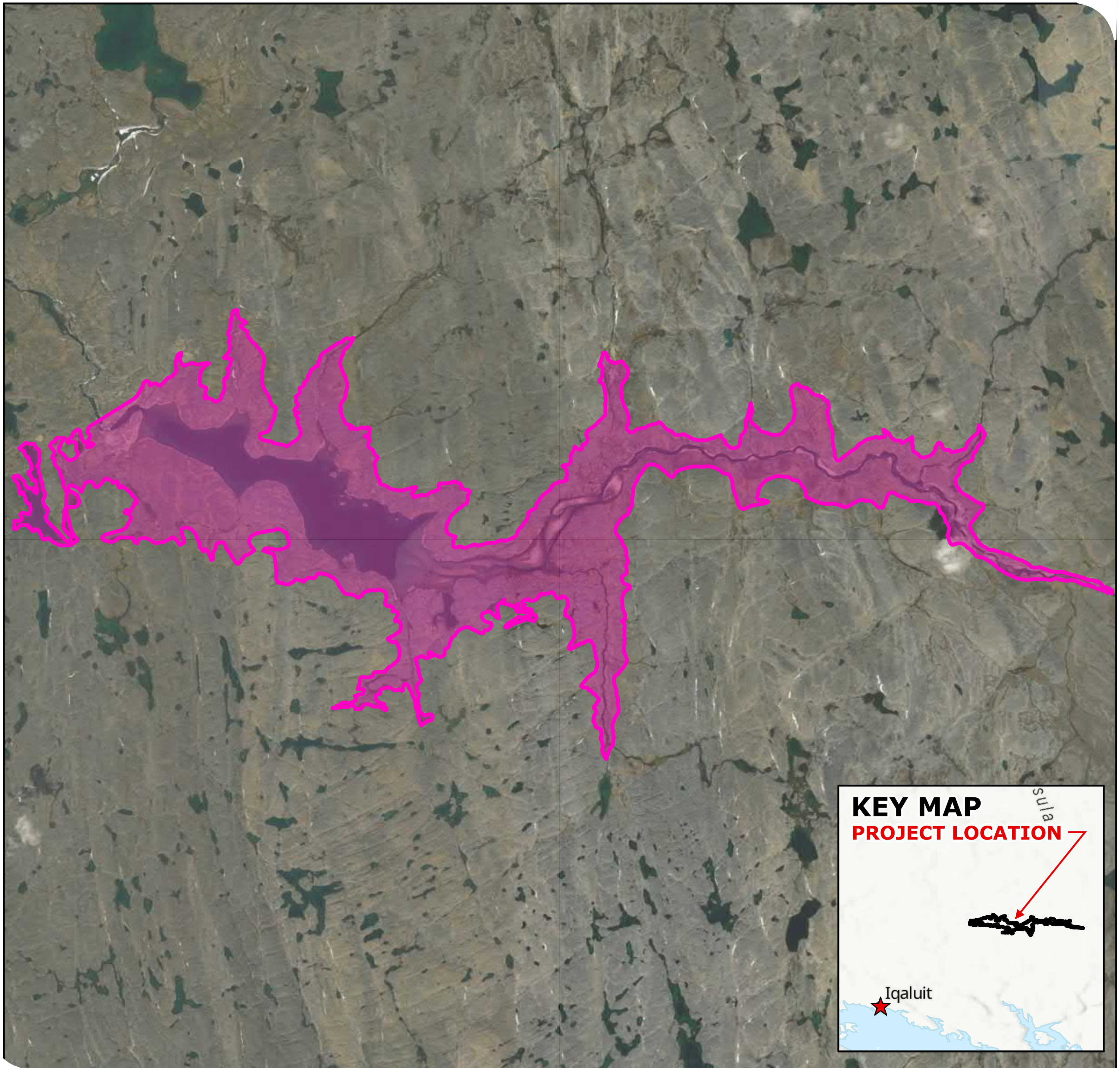

NUNAVUT NUKKIKSAUTIIT CORPORATION

IQALUIT NUKKIKSAUTIIT PROJECT

RESERVOIR CONFIGURATION

FIGURE 10

Main Reservoir at Full Supply Level (550m)

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MAP CREATED BY: -EES
MAP CHECKED BY: -MR
MAP PROJECTION: NAD 1983 CSRS UTM Zone 19N

DILLON CONSULTING

SCALE 1:135,000

0 1 2 km

PROJECT: 25-1319
STATUS: DRAFT
DATE: 2026-03-31

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4.5.7 Construction Camp and Workforce Accommodation

The Project is proposed to use a phased workforce accommodation strategy. During construction, worker accommodation would be provided through a combination of temporary onsite accommodation near the main dam site and, where feasible, accommodation in Iqaluit.

The temporary onsite construction camp is currently proposed near the main dam site and is expected to accommodate approximately 50 personnel during typical construction periods, with peak workforce requirements of up to approximately 90 personnel depending on the final construction schedule, contractor staffing requirements, and execution strategy. The onsite camp footprint is currently estimated at approximately 3 hectares, with final layout and servicing details to be confirmed through detailed design and regulatory review.

The onsite construction camp may include accommodations, kitchen and dining facilities, potable water supply, wastewater collection and treatment, solid waste management, fuel storage, maintenance and storage areas, communications systems, temporary power supply, emergency response equipment, and environmental protection controls.

NNC is also evaluating the use of modular worker accommodation in Iqaluit to reduce pressure on temporary onsite facilities and support local housing legacy opportunities where feasible. If this option advances, municipal approvals, utility servicing requirements, traffic considerations, and community effects will be addressed through applicable permitting and engagement processes.

No permanent full-time operations camp is currently proposed. Long-term operations are expected to be managed primarily from Iqaluit through remote monitoring, scheduled inspections, and periodic maintenance visits. Limited onsite facilities may be retained for emergency response, dam safety inspections, maintenance, storage, or weather-related contingencies.

4.5.7.1 Inuit Employment and Leadership

NNC is dedicated to strong Inuit representation and leadership. This commitment will guide all future hiring, rotation schedules, and project participation.

- **Demonstrated Track Record:** During the 2025 field season, NNC achieved a 70% Inuit employment rate. Furthermore, NNC’s corporate partner, Qikiqtaaluk Corporation (QC), maintained strong Inuit employment rates of 50% in 2023 and 45% in 2024;
- **Operational Staffing:** Long-term day-to-day oversight of the facility will be performed from Iqaluit, reducing the need for continuous onsite staffing and maximizing accessible employment opportunities for residents; and

- **Contractor Requirements:** Hiring for both construction and operations will be refined through a formal tendering process. Contractors will be expected to align with NNC's commitments to Inuit employment and local procurement.

4.5.7.2 Training and Capacity Building

The project presents significant opportunities for skills development that will remain within the territory.

- **Integrated Training:** Capacity-building initiatives will be integrated into project delivery to support the development of a local workforce;
- **Transferable Skills:** Training will focus on providing workers with highly transferable skills in renewable energy, environmental monitoring, heavy equipment operation, and infrastructure management; and
- **Ongoing Mentorship:** A core principle of the project's "Phase Gate" engagement model includes ongoing Inuit mentorship and skills development as the project advances.

4.5.7.3 Workforce Accommodations and Logistics

To support the required workforce while managing impacts on the local community, the INP will utilize a phased accommodation strategy.

- **Onsite Temporary Construction Camp:** A temporary construction camp accommodating approximately 50 personnel will be established near the main dam site. This will support the workforce during peak construction, reduce weather-related delays, and minimize reliance on daily flights from Iqaluit; and
- **Community Housing Contribution:** For longer-term operational and construction needs, NNC will be evaluating the development of modular worker accommodations in Iqaluit, if required.

4.5.8 Preliminary Construction Sequence

The Project construction sequence will be developed during detailed design and refined based on regulatory requirements, environmental commitments, contractor input, logistics planning, procurement strategies, and site conditions. While the final construction approach has not been established, the anticipated progression of major construction activities is described below.

Logistics and Staging Infrastructure

Initial construction activities are expected to focus on the development of laydown areas, storage facilities, housing, and other supporting infrastructure in and around the City of Iqaluit. These facilities will support the housing and transportation of workers, receipt, storage, assembly, and hauling of construction materials and equipment prior to mobilization to the Project site. Establishing these facilities early will help support efficient logistics management for a large-scale project located in a remote environment and reduce negative impact to the City of Iqaluit.

Access Road Construction

Construction of the Project access road is expected to follow the establishment of staging infrastructure. The access road will provide a reliable transportation corridor between Iqaluit and the Project site for personnel, equipment, construction materials, and supplies. Completion of the access road will be a key enabling activity that supports the construction of all major Project components.

Site Establishment and Supporting Infrastructure

Following establishment of site access, construction activities are expected to focus on development of the temporary and permanent infrastructure required to support construction operations. This includes but is not limited to construction offices and camp, temporary access roads, laydown areas, quarry and borrow source development. Construction of the transmission line corridor and associated infrastructure may also commence during this phase where practical. These activities provide the resources and services required to support subsequent major civil construction works.

River Diversion and Headworks Preparation

Prior to construction of the main dam, facilities will be required to safely manage river flows through the construction area. This phase is expected to include construction of the low-level outlet works, temporary diversion facilities, foundation preparation, and development of dam abutments. Completing these works early allows major dam construction activities to proceed under controlled conditions while maintaining downstream flows and construction access. Timing of the diversion will be planned to avoid the freshet period where flows in the river and risk of a flood event are highest. The dam is planned to reach sufficient height by the following freshet to minimize flood risk to the site.

Major Civil and Structural Construction

Construction of the principal Project infrastructure will proceed following river diversion and completion of main dam foundation preparation, principal infrastructure construction. This phase is expected to include construction of the main dam abutments, saddle dams, intake structures, penstock, powerhouse, switchyard, and associated civil works. These components represent the core infrastructure required to impound water, generate electricity, and connect the facility to the transmission system.

Mechanical and Electrical Installation

Installation of the major mechanical and electrical systems is expected to occur following completion of their respective portions of the civil/structural works required to support equipment installation. Activities include installation of gates, controls, turbines, generators, transformers, electrical systems, and other balance-of-plant equipment. The sequencing of these activities will be coordinated with the completion of the associated civil and structural works.

Reservoir Filling and Commissioning

The final phase of construction is expected to include system testing, commissioning, performance verification, and transition to operations. Reservoir impoundment and filling activities are anticipated to occur in parallel with commissioning activities, subject to regulatory approvals, environmental requirements, and operational readiness. This phase will confirm that the Project systems perform as intended prior to commencement of commercial operations.

The anticipated construction sequence is as follows:

- Establish logistics and staging infrastructure in or near Iqaluit, including material receiving, storage, assembly, worker support facilities, and transportation logistics;
- Establish authorized temporary access, where required, to support early mobilization of equipment and materials;
- Construct the approximately 66 km all-season access road between Iqaluit and the Project site;
- Establish onsite construction support infrastructure, including construction offices, temporary camp facilities, laydown areas, borrow areas, temporary access roads, and environmental protection controls;
- Construct river diversion and low-level outlet works to manage downstream flow releases during headworks construction;
- Prepare dam foundations, abutments, and related civil works;
- Construct the main dam, spillway, intake, penstock, powerhouse, switchyard, substations, and associated infrastructure;
- Construct the 69 kV transmission line and associated electrical interconnection infrastructure; and
- Complete mechanical and electrical installation, system testing, reservoir filling, commissioning, and transition to operations.

Final construction methods, seasonal timing, equipment requirements, and contractor sequencing will be refined through detailed design, contractor input, environmental commitments, and applicable regulatory approvals.

4.6 Operations and Maintenance

4.6.1 General

Once operational under normal conditions, the plant will operate 24 hours a day, year-round, subject to planned outages, maintenance, hydrologic conditions, and approved operating requirements. The plant will be designed with a fully automatic control system and supervisory control and data acquisition (SCADA) system. This will enable operation without personnel on-site full time. An operator will, however, conduct routine maintenance and inspections on an almost daily basis regardless of plant conditions. The plant will be continuously monitored by the control system with reports communicated to the operator located in town via fibre optic communications.

Prior to operation, management plans will be developed to govern the safe and reliable operation of the facility. Project specific operation plans are not defined at this point in time. However, typical operation plans for hydroelectric facilities include:

- Operations and Maintenance Plan;
- Dam Safety Plan;
- Water Management Plan;
- Emergency Response Plan;
- Spill Plan;
- Waste Management Plan; and
- Environmental Monitoring Plan.

The project will be primarily remote-operated by a dedicated team of local operators along with resident skilled workers (millwrights, electricians, etc.). During normal operation, the site is expected to require periodic attendance by trained operators rather than continuous full-time staffing. Long-term workforce accommodation requirements have not yet been finalized; however, the objective is for the majority of operations team to be local to Iqaluit and housed in Iqaluit. Specialized work or larger maintenance programs may require an out-of-town work force for specialized skills.

The current operating concept is that some limited on-site accommodations will be available, intended for emergency use only or during larger maintenance programs.

Workforce accommodation strategies will be further evaluated as the project progresses and operational requirements become better defined.

Access to the site will be via the access road, and by helicopter in emergency conditions. Access frequency will vary seasonally and will depend on operational requirements. During periods of normal operation, site visits are expected to occur regularly to perform inspections, maintenance, and operational checks. Additional access may occur during major maintenance activities, dam safety inspections, or emergency response situations.

Maintenance needs are anticipated to be minimal. At a minimum, with the exception of regular planned outages and maintenance, occurring in typical 5-year periods, and major refurbishments approximately every 20 years. Regular inspections will occur in accordance with the Canadian Dam Safety (CDA) guidelines and applicable regulatory requirements. Specific details on the inspection and rehabilitation needs have not been developed at this time. With regular maintenance, the expected design life of a typical hydroelectric facility is greater than 100 years.

Operational procedures, staffing, access requirements, inspection frequency, maintenance needs, and operational controls shall be further defined as the project progresses.

4.6.2 Plant Control

The plant will be operated in an automatic mode by operations personnel in Iqaluit. The primary control requirement will be to meet the electrical load demands for Iqaluit. A head water level transducer will continuously monitor the intake water level and provide the prime control input to:

- Control the amount of water flowing through the turbines; and
- Control turbine operation to optimize energy generation within approved operating limits.

A remote alarm system will be provided to support monitoring of operations for the safety and protection of the environment, personnel and the plant.

Power will be generated at 13.8 kV and stepped up to 69 kV through a power transformer in a substation located adjacent to the powerhouse. Interconnection to QEC will be made via a transmission line to the point of delivery. Power may need to be stepped down to QEC’s 25 kV distribution voltage in a second substation in town, depending on the selected transmission voltage and selected connection point for the new power system. All critical control functions will be backed up by a 125 V DC battery system.

The plant will incorporate an automatic control system, which will adjust turbine wicket gates and valves providing fine flow control to maintain the water level at the intake. Power outages or interruptions on the utility side of the main plant power transformer may cause the plant to shut down and, when the conditions clear, to automatically re-start and come online. Critical shutdown functions will cause a lock-out and require an operator to visit the site to correct the problem and restart the machine.

The performance of the hydro facility was estimated based on the following outages as follows:

Utility not able to accept power (2 days per year):	0.5%
Forced outage (4 days per year):	1.0%
Planned outage (2 days per year):	0.5%
Total Outage:	2.0%

During operations, the plant will have several systems and procedural operating plans to act as controls for mitigation of risk to public safety and environment. Typical key operational controls include but are not limited to:

- Automated turbine and generator controls;
- Reservoir level monitoring and management systems;
- Spillway and outlet works operating procedures;
- Remote monitoring and alarm systems;
- Emergency shutdown capabilities and procedures;
- Dam safety monitoring instrumentation;
- Emergency preparedness and response procedures; and
- Operating procedures designed to maintain compliance with regulatory approvals and environmental commitments.

4.6.3 Operations Activities

The Project is intended to operate as a long-term hydroelectric generation facility and will be designed for largely automated operation with remote monitoring and control from Iqaluit. The facility will incorporate supervisory control and data acquisition (SCADA) systems, communications infrastructure, and automated control systems that allow routine operation of the hydroelectric facility without the need for continuous onsite staffing. Operations personnel will maintain oversight of facility performance, respond to alarms and abnormal operating conditions, and conduct routine inspections and maintenance.

Operations and maintenance activities will be undertaken to support the safe, reliable, and environmentally responsible operation of the hydroelectric facility, reservoir, transmission system, access infrastructure, and associated Project components. These activities will include routine inspections, monitoring, preventative maintenance, corrective maintenance, environmental compliance activities, and periodic equipment replacement throughout the operating life of the Project.

Major operational activities are expected to include the following:

Access Road Maintenance

- Snow clearing and winter maintenance;
- Road grading and surface repairs;
- Inspection and maintenance of bridges, drainage features and water crossings;
- Repair of erosion, settlement, or localized damage; and
- Maintenance of access controls and safety features.

Dam Safety Inspections and Monitoring

- Routine and periodic inspections;
- Monitoring of dam performance and instrumentation;
- Monitoring of reservoir levels and water management facilities;
- Dam safety assessments and reviews by qualified personnel; and
- Maintenance and testing of critical safety systems.

Hydroelectric Facility Operations and Maintenance

- Operation and monitoring of facility performance;
- Inspection and maintenance of equipment and infrastructure;
- Testing and calibration of control, communications, and monitoring systems;
- Preventative and corrective maintenance activities; and
- Refurbishment or replacement of components as required.

Reservoir Operations and Monitoring

- Monitoring of reservoir conditions and water levels;
- Management of water releases and flow conditions;
- Monitoring of seasonal and ice-related conditions;
- Inspection and maintenance of reservoir-related infrastructure; and
- Environmental monitoring activities as required.

Transmission Line Maintenance

- Ground-based and aerial inspections;
- Inspection and maintenance of transmission infrastructure;
- Vegetation management within the right-of-way;
- Repairs following weather-related events or other damage; and
- Replacement of aging or damaged components.

Environmental Monitoring and Compliance

- Monitoring of environmental conditions and performance indicators;
- Inspection of environmental protection measures;
- Collection and reporting of environmental data; and
- Implementation of environmental management and mitigation measures as required.

4.6.4 Reservoir Operation

During operations, the reservoir would be managed to support electricity generation while maintaining required downstream flow releases. The reservoir Full Supply Level is currently proposed at 550 m, and the minimum operating level is currently proposed at 528 m. Reservoir operating rules, instream flow release requirements, discharge management, and monitoring requirements will be refined through hydrologic modelling, aquatic effects assessment, Inuit engagement, and future water licensing.

4.6.4.1 Water use and Discharge

Table 15 summarizes the current screening-level water-use and discharge-management values for construction-phase water withdrawal, reservoir impoundment and flow regulation, operational generation flows, instream flow releases, and discharge management. Final withdrawal locations, reservoir operating rules, IFR values, discharge criteria, compliance monitoring locations, and reporting requirements will be refined through detailed engineering, environmental assessment, Inuit engagement, and the Nunavut Water Board licensing process.

Table 15: Water use and Discharge Summary

Water use Activity	Preliminary Screening Basis	Estimated Flow / Volume	Proposed Management Approach
Construction-phase water withdrawal	Temporary withdrawal for camp services and construction support. Includes camp water, concrete production, dust suppression, compaction, aggregate processing/washing, equipment washing, and testing/flushing. Excludes reservoir impoundment and event-based dewatering.	Typical construction withdrawal: 50–150 m^3/day. Short-duration peak withdrawal: up to 500 m^3/day when multiple water-demand activities overlap. Estimated annual construction water use: 15,000–75,000 m^3/year.	Temporary construction withdrawal from approved source(s). Final sources, daily/annual limits, intake screening, treatment, discharge controls, monitoring, and reporting will be confirmed through NWB licensing.

Water use Activity	Preliminary Screening Basis	Estimated Flow / Volume	Proposed Management Approach
		Key subcomponents: camp water: 8–15 m^3/day typical and 15–25 m^3/day peak; concrete production: 20–150 m^3/day; dust suppression: 20–200 m^3/day; compaction: 10–75 m^3/day; aggregate processing/washing: 5–50 m^3/day; equipment washing: 2–10 m^3/day; hydrostatic testing/flushing: 100–500 m^3/event	
Reservoir impoundment and flow regulation	Reservoir storage and flow regulation to capture seasonal inflows, support generation, and maintain downstream releases. This is separate from construction withdrawal and represents the primary hydrologic alteration for screening.	Full Supply Level: 550 m. Minimum operating level / Low Supply Level: 528 m. Drawdown range: 22 m. Live storage: 1,091,703 dam^3, equivalent to approximately 1,091.7 Mm^3 or 1.092 billion m^3. Total storage: 1,391,033 dam^3, equivalent to approximately 1,391.0 Mm^3 or 1.391 billion m^3. Reservoir area at FSL: approximately 7,136 ha, based on Project reservoir mapping/configuration information.	Reservoir storage and flow regulation. Reservoir filling, drawdown, storage, downstream flow management, and monitoring will be refined through hydrologic modelling, aquatic assessment, Inuit engagement, engineering design, and NWB Type A licensing.
Operational generation flows	Non-consumptive operational water use. Water passes through turbines and is returned	Maximum plant flow: approximately 71.5 m^3/s.	Operational generation flow, not consumptive withdrawal. Generation will be managed

Water use Activity	Preliminary Screening Basis	Estimated Flow / Volume	Proposed Management Approach
	downstream through the powerhouse, low-level outlet, spillway, or a combination of release pathways.	Minimum plant flow: approximately 6.6 m^3/s. 15 MW operating case: approximately 27.7 m^3/s, equivalent to approximately 873,547,000 m^3/year.	through reservoir operating rules, turbine controls, downstream flow requirements, and system demand. Installed capacity does not represent continuous firm generation under all hydrologic conditions.
Instream flow releases	Priority downstream release to support aquatic habitat and downstream flow before, during, and after generation. IFR will be refined through hydrology, aquatic assessment, Inuit Qaujimajatuqangit, engineering, and regulatory review.	Preliminary IFR is currently assumed at approximately 10% of seasonal flows with final requirements to be confirmed through environmental assessment preliminary working range of 1–4 m^3/s may be carried as a planning assumption, subject to confirmation. A preliminary summer planning target of 4.0 m^3/s for June to August may be retained as a working assumption, not a final regulatory commitment.	Treat IFR as a priority release before generation. IFR may be maintained through turbine discharge, low-level outlet release, spillway flow, or combined release pathways. Final seasonal IFR values will be confirmed through NWB Type A licensing.
Discharge management	Variable or event-based discharges associated with construction dewatering, testing/flushing, spillway use, low-level outlet use, downstream discharge management, operations wastewater, maintenance dewatering/wash water,	Construction dewatering: 50–500 m^3/day during active events. Spillway discharge: seasonal and variable when inflow exceeds reservoir storage and generation demand. It is expected that spillway activation during July through November, with	Manage through approved procedures, erosion and sediment controls, settling/filtration where required, containment, treatment, reuse where practical, and authorized discharge conditions. Contaminated water, concrete wash water,

Water use Activity	Preliminary Screening Basis	Estimated Flow / Volume	Proposed Management Approach
	facility runoff, and monitoring.	average daily downstream flows ranging from approximately 25 m^3/s to 115 m^3/s when the spillway is activated. Low-level outlet discharge: event-based and operationally variable. Downstream discharge: variable with inflow, storage, generation, IFR, flood conditions, and operating rules. Operations domestic water/wastewater: less than 5 m^3/day during maintenance visits. Maintenance dewatering, wash water, and runoff: event- and weather-dependent.	and untreated sewage/greywater will not be discharged unless authorized. Final criteria, compliance points, and reporting will be set through NWB Type A licensing.

This table provides the current screening-level basis for Project water use and discharge management. Construction-phase water withdrawal, construction dewatering, hydrostatic testing/flushing, operations domestic water, maintenance dewatering, wash water, and runoff values are screening-level planning estimates developed for NIRB and Nunavut Water Board planning purposes. They are not presented as final contractor water demands. The reservoir and operational generation values are based on the current preliminary design basis, while final operating rules, IFR values, discharge criteria, compliance locations, and monitoring requirements will be refined through hydrologic modelling, aquatic studies, Inuit engagement, engineering design, and Nunavut Water Board Type A licensing.

4.7 Decommissioning and Closure

The Project is intended to operate as a long-term hydroelectric generation facility. Permanent civil infrastructure, including the dam, reservoir water-control structures, powerhouse foundations, and major site infrastructure, is currently expected to have a design and service life greater than 100 years, subject to routine inspection, maintenance, refurbishment, and replacement of components as required. Major mechanical and electrical equipment will have shorter service intervals and may require refurbishment or replacement over typical 20-to-40-year cycles.

The operational life of the reservoir is tied to the operational life of the hydroelectric facility and is currently expected to exceed 100 years, subject to regulatory requirements, dam safety reviews, environmental monitoring, and future operational decisions.

Before Project decommissioning, NNC will prepare a Closure and Reclamation Plan informed by engineering assessment, environmental studies, IQ, regulatory requirements, and engagement with rightsholders and stakeholders. Closure options may include continued use, repurposing, stabilization in place, partial removal, full removal, reservoir drawdown, or restoration toward a natural flow regime, depending on the conditions and regulatory requirements at that time.

4.7.1 Headworks and Reservoir

At the end of the Project life, a detailed engineering assessment would be undertaken to determine the preferred approach for management of the dam, spillway, intake structures, low-level outlet works, and other water-retaining infrastructure.

Potential closure options may include complete removal, partial removal, stabilization in place, conversion for an alternate use, or a combination of these approaches. The preferred alternative would be selected based on technical feasibility, safety, environmental effects, future land use considerations, and regulatory requirements applicable at the time of closure.

Where removal is selected, activities may include controlled reservoir drawdown, modification or removal of water control structures, and the embankment dam(s) in part or whole, demolition of above-grade infrastructure, management of construction materials, stabilization of exposed areas, and restoration of affected lands and waterways. Where infrastructure is retained, measures would be implemented to support long-term public safety and structural stability.

Closure planning for the reservoir would be closely integrated with closure planning for the dam and associated water management infrastructure.

Depending on the selected closure strategy, the reservoir may remain in place, be partially drawn down, or be returned toward a natural flow regime. Reservoir management activities would be developed to minimize potential impacts associated with shoreline erosion, sediment mobilization, water quality changes, fish and fish habitat, and downstream flow conditions.

The final reservoir closure strategy would be supported by engineering studies, environmental assessments, and regulatory review completed at the time of decommissioning.

4.7.2 Powerhouse and Associated Facilities

The powerhouse, switchyard, substation, maintenance facilities, and other permanent buildings would be assessed to determine whether they should be removed, repurposed, or retained.

Typical closure activities may include removal of mechanical and electrical equipment, de-energization of electrical systems, demolition of structures, management of hazardous materials if present. The powerhouse and switchyard will have all equipment and buildings removed with materials salvaged recycled or brought to landfill. Typically, foundations will be removed to a defined depth, and then the area reclaimed. Where appropriate stabilization of disturbed areas.

Where beneficial future uses are identified, certain facilities may be retained or repurposed subject to regulatory approval and stakeholder input.

4.7.3 Penstock

The buried penstock is currently anticipated to be left in place following decommissioning, unless future engineering assessments determine that removal provides a greater environmental or safety benefit. The penstock will be a substantial piece of infrastructure. Removal of the penstock would require significant excavation, disturbance of previously stabilized ground, modification of drainage patterns, and additional construction activities that may result in greater environmental impacts than leaving the infrastructure in place.

The penstock would be isolated from the water conveyance system via concrete plug or other mechanism, drained as appropriate, and stabilized to eliminate long-term safety or environmental risks.

4.7.4 Access Roads

The Project access road is currently anticipated to remain in place following closure unless future regulatory requirements, stakeholder input, or land-use objectives indicate otherwise.

Retention of the access road may provide ongoing benefits for regional access, monitoring, maintenance, emergency response, or future land use activities. Where portions of the road are no longer required, localized reclamation measures may be implemented to restore drainage patterns, stabilize slopes, and promote natural revegetation.

4.7.5 Transmission Line

At the end of Project operations, the transmission line and associated electrical infrastructure would be evaluated to determine whether continued use, repurposing, or removal is appropriate.

Where removal is selected, activities may include removal, salvage and recycling of conductors, electrical equipment, and structures. Foundations will be removed to a given depth below grade. Disturbed areas would be stabilized and reclaimed as appropriate for site conditions and future land use objectives.

4.7.6 Closure Planning

Prior to Project decommissioning, a comprehensive Closure and Reclamation Plan would be developed and updated as required to satisfy applicable regulatory requirements. The plan would be informed by engineering assessments, environmental studies, regulatory requirements, and engagement with rightsholders and stakeholders.

Depending on the scope of the selected closure alternative, supporting plans and studies may include:

- Decommissioning and demolition plans;
- Reservoir drawdown and water management plans;
- Environmental protection plans;
- Spill prevention and response plans;
- Waste management plans;
- Hazardous materials management plans;
- Sediment and erosion control plans;
- Reclamation and revegetation plans;
- Wildlife protection and monitoring plans;
- Water quality monitoring plans;
- Public safety and site security plans;
- Traffic and transportation management plans; and
- Construction execution and sequencing plans.

The final closure strategy, supporting studies, and reclamation objectives will be developed closer to the end of the Project life when more information is available to evaluate alternatives and determine the most appropriate long-term outcome for the Project Area.

Conceptual Closure Plan

Closure planning for the INP will be guided by the principles of sustainability, IQ, and adaptive management, in alignment with NIRB guidance. Closure objectives are to return the PDA to safe, stable, and productive conditions that support ecosystem recovery, maintain water quality, and enable future Inuit land use consistent with community values.

Key closure considerations include:

- Design Life and Durability: The Project's permanent civil infrastructure, including the dam and powerhouse foundations, is designed for a service life of 100 years, with major equipment overhauls scheduled at 20-to-40-year intervals. Structures will be engineered to withstand 1:10,000-year seismic events and regional ice loads of up to 2.02 m thickness;
- Ecosystem Function and Stability: Activities during decommissioning will focus on restoring natural drainage, re-establishing tundra vegetation, and maintaining permafrost and terrain stability. Disturbed areas, including access roads, quarry sites, and temporary work areas, will be regraded and revegetated with native species suited to local climatic conditions;
- Water Quality Protection and Reservoir Drawdown: Reservoir drawdown will be conducted gradually to prevent erosion, sediment release, or abrupt hydrological change. Water quality will be monitored during and after drawdown to confirm that downstream aquatic ecosystems remain stable and suitable for fish and wildlife use;
- Infrastructure Removal and Site Rehabilitation: Infrastructure not required for ongoing power generation such as temporary camps, laydown areas, and non-essential access routes—will be dismantled and materials removed from site. Foundations, borrow areas, and disturbed soils will be contoured to match surrounding terrain and promote natural regeneration;
- Adaptive Management and Climate Resilience: Closure measures will be designed to accommodate projected climate change effects, including permafrost thaw, increased precipitation, and variable freeze–thaw cycles. Monitoring data will be reviewed regularly, and adaptive management actions will be implemented where performance indicators (e.g., slope stability, vegetation cover, water quality) deviate from expected trends; and
- Inuit Land Use, IQ, and Community Participation: Inuit knowledge and community input will guide reclamation priorities and post-closure land uses. Engagement with HTAs, Elders, and youth will continue throughout the closure phase to confirm culturally appropriate success criteria and preferred end uses of rehabilitated areas.

Post-closure monitoring is anticipated to continue for a minimum of five years, or longer if required, to verify physical stability, ecological recovery, and the effectiveness of adaptive measures. The conceptual closure plan will be refined as new information becomes available through ongoing baseline studies, design development, and regulatory review, and to incorporate recommendations from technical findings and community feedback. Updates will be made as part of the adaptive management process to reflect evolving climate, hydrological, and permafrost conditions. Post-closure monitoring duration and performance criteria will be finalized in consultation with NIRB and the Nunavut Water Board, informed by site-specific conditions and community input.

5.0 Existing Environment

The Project lies within the Northern Arctic ecozone, spanning the Meta Incognita Peninsula and Hall Peninsula Upland ecoregions. The regional landscape includes exposed bedrock plateaus, fjord-influenced coastal environments, and lake-plain systems associated with the Kuugaaluk River. Climate is Low Arctic, with short, cool summers, long winters, and continuous permafrost (EcoLogic, 2025).

To align with NIRB screening requirements, the Existing Environment section is organized under the following required headings:

- Climate and Permafrost;
- Atmospheric;
- Archaeological;
- Hydrology and Water Quality;
- Fish and Fish Habitat;
- Vegetation and Terrain;
- Wildlife (including Species at Risk); and
- Socio-Economic Environment and Inuit Land Use.

The environmental information presented in **Section 5.2** is intended to summarize baseline conditions and preliminary observations based on available data and the 2025 field programs within the Environmental Study Area (**Figure 5**). No conclusions regarding the magnitude or significance of potential effects are drawn at this stage. Baseline programs are ongoing and will continue over multiple field seasons to support future effects assessment and mitigation planning within the Regional Study Area (**Figure 3**). Each of the following subsection describes baseline conditions, sensitivities, and relevance to potential Project interactions.

5.1 Physical Environment

5.1.1 Climate and Permafrost

Regional climate conditions are characterized by a cold, polar climate, with mean annual air temperatures well below freezing, persistent high winds, and strong marine influences associated with Frobisher Bay. Seasonal patterns include long cold winters; short, cool summers; and highly variable snowfall and wind-driven snow redistribution. These factors shape local snow accumulation, surface water availability, and biological productivity, and are key drivers of ecological and hydrological processes in the Kuugaaluk River system (EcoLogic, 2025).

Permafrost in the region is continuous, with ground temperatures typically remaining below 0°C throughout the year. The active layer thaws only during the brief summer season, resulting in freeze–thaw cycles that influence soil stability, drainage, and vegetation patterns. Permafrost conditions also play a critical role in determining terrain sensitivity, slope stability, and potential responses to project-related ground disturbance. Initial field observations indicate variations in active-layer depth across terrain types, with deeper thaw in coarse, well-drained soils and shallower thaw in peat-rich or shaded areas (EcoLogic, 2025).

These climatic and permafrost conditions are central considerations for project planning, as they influence infrastructure design, access timing, baseline hydrology, and the selection of appropriate mitigation measures. Additional multi-year climate and permafrost monitoring will refine the understanding of seasonal variability and long-term trends relevant to the Project.

5.1.1.1 Landforms, Geology and Soils

Landforms range from rugged uplands with frost-shattered bedrock to gently rolling till veneers and glaciofluvial deposits. Common features include patterned ground, solifluction lobes, polygonal terrain, and shallow peat depressions (EcoLogic, 2025).

Thin mineral soils dominate uplands, while organic soils occur where drainage is impeded by permafrost (EcoLogic, 2025).

5.1.1.2 Potential Project Interactions

Potential interactions between the Project and climate, permafrost, and associated landforms include:

- Disturbance of thaw-sensitive soils and ice-rich permafrost during construction of access roads, transmission corridors, and Project infrastructure;
- Changes in surface drainage patterns and snow accumulation resulting from linear infrastructure and altered terrain;
- Increased risk of localized thaw settlement, erosion, or slumping in areas with high ground-ice content; and
- Implications for access timing, construction methods, and long-term infrastructure performance under changing climatic conditions.

These interactions represent cross-cutting considerations that may influence multiple Valued Ecosystem Components, including hydrology, aquatic habitat, vegetation, wildlife movement, and travel safety.

5.1.1.3 Proposed Approach and Future Work

Climate and permafrost conditions will be addressed as foundational environmental constraints in Project planning and design. Additional multi-year climate and permafrost investigations are planned to refine baseline understanding of seasonal variability, active-layer dynamics, and long-term trends relevant to the Project.

Future work will include targeted permafrost and terrain assessments, integration of regional climate datasets, and consideration of projected climate change effects on permafrost stability. Information collected through these programs will inform infrastructure design, access planning, mitigation measures, and adaptive management strategies, and will be incorporated into the Environmental Impact Statement (EIS).

5.1.2 Atmospheric

The Project Area is located within a cold Arctic climate zone characterized by long, cold winters; short, cool summers; strong and persistent winds; and highly variable snowfall influenced by wind redistribution. Atmospheric conditions are strongly affected by regional marine influences associated with Frobisher Bay. These climatic factors influence snow accumulation, surface water availability, permafrost stability, and seasonal accessibility within the Kuugaaluk River system.

Baseline regional climate data are available from long-term Environment and Climate Change Canada (ECCC) monitoring stations in Iqaluit, which provide representative information on temperature, wind patterns, precipitation, and extreme weather events. At the Project site, atmospheric conditions are expected to be similar to regional trends, with localized variation due to elevation, topography, and exposure.

5.1.2.1 Potential Project Interactions

Potential interactions between the Project and the atmospheric environment during early field investigations, construction, and operations may include:

- Temporary air emissions from diesel-powered equipment, generators, and vehicles;
- Localized dust generation associated with ground disturbance, vehicle traffic, and quarry or borrow activities;
- Short-term emissions associated with construction activities and camp operations; and
- Greenhouse gas emissions related to fuel use during construction and operations.

During operations, the Project is expected to substantially reduce regional greenhouse gas emissions through the displacement of diesel-generated electricity currently used to supply Iqaluit.

5.1.2.2 Proposed Approach and Future Work

At the Project Proposal stage, atmospheric effects are anticipated to be localized, temporary, and manageable through standard best management practices. Air quality effects will be assessed in greater detail during the EIS phase.

Targeted atmospheric and air quality studies, including the characterization of meteorological conditions and potential emission sources, are planned for the 2026 field season. These studies will support predictive modelling and effects assessment in the EIS, including comparison to applicable regulatory benchmarks such as the Canadian Ambient Air Quality Standards (CAAQS).

Mitigation measures, such as equipment maintenance, dust suppression, fuel management, and emissions controls, will be refined as Project design advances and incorporated into future environmental protection planning.

5.1.3 Archaeological and Heritage Resources

The Project Area lies within a region of long-standing Inuit land use and travel, and archaeological and heritage resources may be present within the Project Development Area and surrounding landscape. These resources may include archaeological sites, cultural features, travel routes, and areas of historical significance that reflect both historic and contemporary Inuit use of the land.

During the 2025 field assessment, areas of archaeological and cultural significance were identified in the vicinity of the proposed reservoir area through field reconnaissance and Inuit knowledge input (**Figure 4**). These findings confirm the presence of heritage sensitivities within the broader Project

Area and underscore the importance of careful planning as the Project advances.

Previous regional studies and IQ further indicate that archaeological and heritage resources are most likely to occur near water bodies, travel corridors, and prominent landforms within the Hall Peninsula landscape.

5.1.3.1 Potential Project Interactions

Potential interactions with archaeological and heritage resources may occur during ground-disturbing activities associated with field investigations, construction, and infrastructure development, including:

- Geotechnical drilling, trenching, or test pitting;
- Construction of access roads, camps, transmission corridors, and Project infrastructure; and
- Quarrying or borrow material extraction, if required.

Without appropriate planning and mitigation, such activities could result in disturbance or damage to previously unidentified archaeological or cultural resources.

5.1.3.2 Proposed Approach and Future Work

Archaeological and heritage resources will be managed in accordance with the *Nunavut Act*, the Nunavut Archaeological and Palaeontological Sites Regulations (NAPS Regulations), *Nunavut Land Claims Agreement* (NLCA), and applicable guidance from the Government of Nunavut Department of Culture and Heritage.

A staged archaeological assessment program is planned, beginning with desktop review and Inuit knowledge input, followed by field-based archaeological surveys in advance of any ground-disturbing activities. These surveys will be completed under the appropriate territorial permits and, where feasible, with Inuit participation in fieldwork.

Where archaeological or heritage resources are identified from the 2025 program, avoidance will be the preferred mitigation approach through Project design refinement. If avoidance is not feasible, site-specific mitigation measures will be developed in consultation with regulators and Inuit organizations.

A chance-find protocol will be implemented for all Project phases so that any previously unidentified archaeological or cultural resources encountered during fieldwork or construction are protected, with work halted and appropriate authorities notified.

Information collected through ongoing archaeological investigations will be incorporated into the EIS to support effects assessment, mitigation planning, and informed regulatory and community decision-making.

5.1.4 Hydrology and Water Quality

5.1.4.1 Hydrology

The hydrology of the Project Area is driven by a cold, polar climate with continuous permafrost, short melt seasons, and highly variable snowfall and runoff patterns. The INP is located within the Kuugaaluk River system, where streamflow is strongly influenced by snowmelt, periodic rainfall events, and freeze-thaw cycles. Initial hydrological investigations initiated in 2024 include continuous hydrometric monitoring at key locations, as well as characterization of snowpack, ice thickness, and permafrost conditions that influence surface-water behaviour.

These multi-year baseline studies are documenting base-flow conditions, seasonal variability, and interannual trends to support future evaluation of the natural water regime. As of 2025, hydrometric datasets remain limited, and additional monitoring is required to define long-term flow patterns, low-flow conditions, and freshet dynamics. No operational hydrology, reservoir rules, or flow targets have been developed at this stage. Current hydrology work is focused exclusively on baseline characterization, consistent with the early planning phase.

As monitoring data accumulate, they will support future assessments related to ecological flow needs, downstream water-level stability, fish migration and spawning periods, and the potential for flow-related changes to terrain or ice conditions. These datasets, together with engineering and environmental analyses completed in later phases, will inform a future application to the Nunavut Water Board under the Nunavut Waters and *Nunavut Surface Rights Tribunal Act* (2002).

5.1.4.2 Water Quality Program

A multi-season water-quality baseline program is underway to characterize the chemical, physical, and biological conditions of the Kuugaaluk River system. Sampling locations include upstream areas, the proposed reservoir footprint, and downstream reaches to capture spatial variability within the watershed. Parameters analyzed include:

- total suspended solids (TSS);
- nutrients (nitrogen, phosphorus);
- major ions;
- key metals (e.g., mercury, selenium, lead); and
- basic field parameters (pH, conductivity, dissolved oxygen, temperature).

Sampling frequency and analytical methods follow Canadian Council of Ministers of the Environment (CCME) Water-Quality Guidelines and relevant requirements of the *Fisheries Act* (1985). The baseline program is designed to establish reference conditions prior to any future development and to support predictive modelling of potential changes during the environmental assessment phase.

Water-quality information will also inform the human health, aquatic ecosystem, and country-foods components under the Valued Ecosystem Components (VEC) framework. As additional years of sampling are completed, the dataset will be used to evaluate natural variability, identify sensitive periods or parameters, and develop thresholds for future adaptive management.

5.1.4.3 Surface Water System

The Project is situated within the Kuugaaluk River system, which features a diverse and dynamic freshwater system influenced by continuous permafrost, glacial landforms, and steep topographic transitions. Key hydrological components include:

- Unnamed Lake, which corresponds to the proposed reservoir area;
- Multiple shallow tributaries, characterized by moderate gradients, gravel and cobble substrates, and clear, cold waters; and
- The Kuugaaluk River mainstem, exhibiting complex channel forms including riffles, rapids, cascades, chutes, and deep pools (Dillon, 2025).

Aerial, drone, and LiDAR surveys conducted in 2025 confirmed that channel morphology is strongly shaped by bedrock control, glacial deposits, and permafrost-dominated drainage pathways (Dillon, 2025). These factors contribute to distinct habitat types and influence seasonal flow distribution, sediment transport, and aquatic productivity.

Additional hydrological work including snow surveys, ice-thickness measurements, and refined watershed delineation will continue throughout the multi-year baseline program to support future impact assessment and design consideration.

5.1.4.4 Potential Project Interactions

Potential interactions between the Project and the hydrological and surface-water environment may include:

- Alteration of natural flow patterns and water levels associated with future water storage and controlled releases;
- Changes in sediment transport and deposition in response to altered flow regimes;
- Interactions between flow, ice formation, and permafrost that may influence downstream stability and travel conditions;
- Potential effects on aquatic habitat availability, connectivity, and seasonal access for fish and other aquatic organisms; and
- Implications for downstream water quality during construction or future operations, particularly during high-flow or ice-affected periods.

At this stage, these interactions are conceptual and are being considered to inform baseline data collection and future assessment needs, rather than to predict effects.

5.1.4.5 Proposed Approach and Future Work

Hydrological and surface-water studies will continue as part of a multi-year baseline program to strengthen understanding of natural variability, seasonal dynamics, and longer-term trends within the Kuugaaluk River system. Planned work includes continued hydrometric monitoring, expanded snow surveys, ice-thickness measurements, and refined watershed delineation.

As baseline datasets mature, they will support future assessments related to ecological flow requirements, fish migration and spawning periods, ice dynamics, and potential terrain or stability interactions. These datasets, together with engineering and environmental analyses undertaken in later phases, will inform the development of reservoir operating concepts and a future application to the Nunavut Water Board under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (2002).

Water-quality data will also inform aquatic ecosystem, human health, and country-foods components under the VEC framework. Over time, the dataset will be used to evaluate natural variability, identify sensitive periods or parameters, and support the development of thresholds and adaptive management measures for future project phases.

5.1.4.6 Operational Hydrology

Operational hydrology for the Project remains at a preliminary stage and will continue to be refined through baseline monitoring, hydrologic modelling, bathymetry, engineering development, Inuit engagement, aquatic studies, and regulatory review. Based on the preliminary design engineering, the synthetic hydrologic record estimates an annual average inflow of approximately 41.1 m^3/s, or approximately 1,294.7 Mm^3/year. A 15 MW operating case is estimated to require approximately 27.7 m^3/s, or approximately 873,547,000 m^3/year. The 30 MW plant configuration has a maximum plant flow of approximately 71.5 m^3/s, a minimum plant flow of approximately 6.6 m^3/s, and a preliminary estimated capacity factor of approximately 49%.

The Project concept relies on reservoir storage to capture seasonal freshet flows and support year-round generation and downstream flow releases. Final reservoir operating rules, discharge management requirements, instream flow release requirements, and monitoring requirements will be developed through hydrologic modelling, aquatic assessment, Inuit engagement, engineering review, and the Nunavut Water Board licensing process.

NNC is continuing to advance the hydrologic baseline and technical basis for future water management planning through expanded field monitoring and modelling. This includes downstream and upstream hydrometric monitoring, continuous reservoir monitoring, supplemental reservoir bathymetry, baseline coastal monitoring, snow and ice measurements and development of a preliminary reservoir water balance and downstream hydraulic model. These studies are intended to improve understanding of inflow, storage, evaporation, ice processes, discharge behaviour, and downstream hydraulic response under both baseline and future Project and filling conditions.

The current Project concept identifies instream flow release (IFR) as a priority release before generation. A preliminary summer IFR target of 4.0 m^3/s has been identified for planning purposes for the June to August period, while winter flow requirements are currently expected to be met through continuous generation flow. However, IFR values, seasonal release rules, and low-flow operating assumptions remain preliminary and will require further confirmation through hydrologic analysis, aquatic studies, IQ, engineering development, and regulatory engagement.

NNC is also collecting real-time hydrometric data to support calibration and refinement of the synthetic hydrologic record and to inform future effects assessment, reservoir operating concepts, and licensing requirements. A future application to the Nunavut Water Board for a Type 'A' Water Licence will be informed by this ongoing work, together with future engineering and environmental assessment studies. NNC also anticipates ongoing technical engagement with NWB staff to confirm information needs as Project planning advances.

5.2 Biological Environment

5.2.1 Aquatic Ecosystems and Fish Habitat

The aquatic environment within the Kuugaaluk River system is characteristic of a cold, oligotrophic Arctic watershed shaped by bedrock geology, glacial processes, and continuous permafrost. Drone, LiDAR, and aerial-based assessments from 2025 indicate a diverse and dynamic channel network that supports a range of habitat types important for Arctic fish species, particularly Arctic char (*Salvelinus alpinus*).

The mainstem river and its tributaries exhibit complex channel morphology, including riffles, rapids, cascades, pools, and bedrock-controlled chutes. These features create varied hydraulic conditions that influence habitat suitability for different life stages of fish. Substrates are predominantly composed of gravel, cobble, and boulder materials, providing well-drained, stable conditions that can support spawning and juvenile rearing habitats.

Tributary streams entering the proposed reservoir area are generally shallow with moderate gradients, reflecting limited depositional environments and strong geomorphic control. These tributaries contribute cold, well-oxygenated water and provide additional connectivity throughout the watershed.

Overall, the system is defined by clear, cold, and nutrient-poor (oligotrophic) waters with minimal aquatic vegetation. These characteristics are typical of Arctic freshwater ecosystems and support a narrow but well-adapted suite of aquatic species. This habitat structure is consistent with known preferences of Arctic char, the only species confirmed to date within the Project Area (Dillon, 2025).

5.2.1.1 Fish Species Presence

Arctic char (*Salvelinus alpinus*) is the only fish species confirmed to occur within the Kuugaaluk River system to date. During the 2025 field program, 28 Arctic char were harvested opportunistically by local community members, providing the only verified records of fish presence within the Project Area (Dillon, 2025).

Although several additional species such as:

- Arctic grayling (*Thymallus arcticus*);
- Lake whitefish (*Coregonus clupeaformis*);
- Ninespine stickleback (*Pungitius pungitius*);

- Threespine stickleback (*Gasterosteus aculeatus*); and
- Lake trout (*Salvelinus namaycush*).

All are considered regionally possible based on broader Nunavut distributions; however, none have been documented within the Kuugaaluk River system through either historical studies or the 2025 aquatic assessments.

5.2.1.2 Fish Habitat Suitability

Based on established Arctic char habitat preference criteria (Evans *et al.* 2002) and the results of the 2025 drone, LiDAR, and aerial imagery analysis, the Kuugaaluk River system contains several habitat features indicative of high suitability for various life stages of Arctic char. Riffles and gravel-to-cobble substrates located downstream of the proposed reservoir footprint provide favourable spawning habitat, offering the appropriate mix of substrate size, flow conditions, and oxygenation required for egg deposition and incubation.

In addition, pools and run habitats distributed throughout the system provide important rearing areas for juveniles and serve as movement corridors for adults, supporting seasonal migrations and access to feeding and overwintering habitats.

Preliminary assessments further indicate that upstream reaches and multiple tributaries may also provide suitable spawning, rearing, and migration habitat, although these areas require field-based verification during the next phase of aquatic studies (Dillon, 2025).

5.2.1.3 Potential Project Interactions

Potential interactions between the Project and aquatic ecosystems and fish habitat may include:

- Alteration of flow regimes and water levels that influence habitat availability, connectivity, and suitability for different life stages of Arctic char;
- Changes in sediment transport, deposition, or substrate composition that could affect spawning and rearing habitats;
- Modification of channel morphology or tributary connectivity associated with future infrastructure development;
- Potential barriers to fish movement or migration if connectivity is altered; and
- Changes in water temperature, ice conditions, or water quality that may influence habitat function.

At this stage, these interactions are identified conceptually to inform baseline data collection and future assessment needs and do not represent predicted effects.

5.2.1.4 Proposed Approach and Future Work

Aquatic ecosystem and fish habitat studies will continue as part of a multi-year baseline program designed to confirm habitat use, seasonal patterns, and interannual variability within the Kuugaaluk River system. Future work will include field-based habitat validation, fish presence and movement surveys, and integration of Inuit Qaujimajatuqangit related to fish behaviour, harvesting areas, and seasonal use.

As datasets mature, they will support future assessments of habitat sensitivity, fish passage considerations, and ecological flow needs, and will inform the development of mitigation and monitoring strategies. Information from these studies will be incorporated into the EIS and will support regulatory review under the *Fisheries Act* and future licensing considerations under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*.

5.2.2 Vegetation and Terrain

Baseline fieldwork completed in 2025 documented a range of Low Arctic tundra, wetland, riparian, and frost-influenced ecosystems within the LSA. Vegetation patterns are closely linked to terrain, permafrost conditions, drainage, and substrate type, resulting in distinct ecosystem units across upland, mesic, wetland, and fluvial environments (EcoLogic, 2025).

5.2.2.1 Upland and Barren Tundra

Upland areas are characterized by exposed bedrock, thin soils, and strong wind exposure. Dominant terrain and vegetation features include:

- Dry Lichen and Sparse Tundra on upper slopes and ridge crests, composed of Dryas integrifolia, Salix arctica, dwarf heather species, mosses, and lichen mats;
- Fellfield and Blockfield terrain, where frost-shattered bedrock supports minimal vegetation and reflects high terrain sensitivity; and
- Bedrock Outcrop and Talus slopes with limited plant cover but potential nesting habitat for cliff-associated bird species.

These landforms reflect the influence of periglacial processes, continuous permafrost, and low nutrient availability (EcoLogic, 2025).

5.2.2.2 Mesic and Wet Tundra

Mid-slope and low-lying areas support more moisture-retentive vegetation communities:

- Mesic Graminoid Tundra occurs where drainage is imperfect, often with patterned ground indicative of active permafrost; and

- Wet Graminoid Tundra, fens, and shallow peat wetlands develop in zones with perched water tables and poor drainage, dominated by sedges and mosses.

These ecosystems are sensitive to surface disturbance and thermokarst due to the presence of ice-rich permafrost (EcoLogic, 2025).

5.2.2.3 Riparian and Fluvial Complexes

Vegetation along stream and river corridors reflects dynamic hydrological and geomorphic processes:

- Glaciofluvial terraces, gravel bars, and seasonally flooded benches support low shrubs, sparse graminoids, and early successional vegetation; and
- Willow patches occur in more stable riparian zones, providing important cover and movement corridors for wildlife.

These areas are characterized by variable substrate sizes (gravel to boulder), periodic flooding, and strong ice-related disturbance (EcoLogic, 2025).

5.2.2.4 Coastal and Near-Coastal Heath Tundra

Although limited within the Local Study Area, more productive Shrub–Heath Tundra communities may occur closer to fjord environments, where snow capture, moisture availability, and nutrient accumulation are greater (EcoLogic, 2025).

5.2.2.5 Vegetation Species

Common species observed during 2025 field surveys include:

- Dwarf shrubs: Dryas integrifolia, Betula nana, Salix arctica;
- Graminoids: Carex, Eriophorum, Dupontia, Luzula; and
- Bryophytes and lichens: extensive moss mats, liverworts, and crustose and fruticose lichen cover.

These functional groups reflect the cold, nutrient-limited conditions typical of Low Arctic landscapes (EcoLogic, 2025).

5.2.2.6 Data Gaps and Future Work

Because 2025 surveys occurred outside the optimal growing and flowering period, species-level identification was limited. A more detailed vegetation inventory—including rare plant surveys, community mapping, and biomass characterization—will be conducted during the 2026 field season to complete the baseline dataset (EcoLogic, 2025).

5.2.2.7 Potential Project Interactions

Potential interactions between the Project and vegetation and terrain may include:

- Disturbance or removal of tundra vegetation during construction of access roads, transmission corridors, camps, and other infrastructure;
- Soil compaction, erosion, or vegetation loss in areas with thin soils or frost-sensitive substrates;
- Increased susceptibility to thermokarst development and altered drainage patterns in ice-rich permafrost zones;
- Fragmentation of vegetation communities and localized changes in habitat structure; and
- Challenges to natural revegetation in areas with limited soil development and short growing seasons.

At this stage, these interactions are identified to inform baseline data needs and future assessment considerations rather than to predict effects.

5.2.2.8 Proposed Approach and Future Work

Vegetation and terrain studies will continue as part of a multi-year baseline program designed to refine ecosystem mapping, confirm species composition, and identify sensitive habitats. Because 2025 surveys occurred outside the optimal growing and flowering period, species-level identification was limited.

A more detailed vegetation inventory will be completed during the 2026 field season, including rare plant surveys, community-level mapping, and biomass characterization. This data will support improved understanding of ecosystem distribution, sensitivity to disturbance, and recovery potential.

Information generated through these studies will inform future impact assessment, mitigation planning (e.g., micro-siting, avoidance of sensitive habitats, reclamation approaches), and long-term monitoring strategies, and will be incorporated into the EIS.

5.2.3 Wildlife

5.2.3.1 Remote Camera Observations

Baseline wildlife surveys conducted during the 2025 field season indicate that the Project Area supports a range of terrestrial wildlife species typical of the Low Arctic tundra environment. Observations confirm regular seasonal use of the Local Study Area (LSA) by several mammal and bird species, with wildlife distribution closely linked to tundra vegetation, terrain features, and travel corridors.

A network of 23 wildlife cameras deployed across the LSA recorded multiple species during the August–September 2025 monitoring period. Species detected include:

- Barren-ground caribou (*Rangifer tarandus groenlandicus*), with frequent detections across multiple camera locations;
- Arctic hare (*Lepus arcticus*);
- Arctic fox (*Vulpes lagopus*); and
- Ptarmigan (*Lagopus spp.*) and other tundra bird species.

Caribou were consistently recorded across many camera sites, indicating regular seasonal use of the area during the late summer and early fall period (EcoLogic, 2025).

5.2.3.2 Wildlife Transects

During the 2025 summer field surveys, twenty-nine ground-based wildlife transects were completed within the LSA. These surveys documented the presence of:

- Barren-ground caribou;
- Arctic fox;
- Arctic hare; and
- Several tundra bird species.

Late-season timing limited the detectability of migratory birds and raptors, and survey results are therefore considered preliminary with respect to avian diversity and seasonal use (EcoLogic, 2025).

5.2.3.3 Species at Risk

Barren-ground caribou were documented within the Project Area during the 2025 field program. This population is classified as Threatened by Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and is currently under consideration for listing under Schedule 1 of the *Species at Risk Act* (*SARA*).

No additional federally listed *SARA* species were detected during the 2025 field surveys.

5.2.3.4 Potential Project Interactions

Potential interactions between the Project and wildlife may include:

- Disturbance or displacement of wildlife resulting from increased human presence, aircraft activity, noise, and vehicle traffic;
- Interference with wildlife movement patterns, particularly for wide-ranging species such as caribou;
- Sensory disturbance affecting foraging, resting, or movement behaviour; and
- Temporary changes in habitat availability associated with future infrastructure development.

At this stage, these interactions are identified to inform baseline data needs and future assessment considerations rather than to predict effects.

5.2.3.5 Proposed Approach and Future Work

Wildlife studies will continue as part of a multi-year baseline program to improve understanding of species presence, seasonal use, and movement patterns within and surrounding the Project Area. Future work will focus on expanding temporal coverage to include spring and early summer periods, when wildlife activity and sensitivity may differ from late-season conditions.

Planned studies include continued operation and expansion of the wildlife camera network, additional transect surveys, and targeted surveys for migratory birds and raptors during appropriate seasonal windows. IQ and local observations will continue to inform survey design, interpretation of results, and identification of sensitive areas or periods.

Information generated through these programs will support future effects assessment, mitigation planning (e.g., timing restrictions, micro-siting of infrastructure), and monitoring strategies, and will be incorporated into the EIS.

5.3 Socio-economic Environment

The existing socio-economic environment will be identified and described during 2026. The following are the objectives of the Socio-economic Impact Assessment:

1. Develop a Socio-Economic Impact Assessment (SEIA) that identifies current conditions, predicts both positive and negative potential socio-economic impacts, and proposes mitigation and enhancement measures;
2. Collaboratively conduct robust Inuit-focused community engagement in Iqaluit with NNC, for the purpose of developing a SEIA, ensuring inclusive, intergenerational participation and Free, Prior, and Informed Consent. This engagement will be planned in close partnership with NNC and executed by the proponent following plan approval from NNC. The proponent will maintain consistent communication with NNC throughout the duration of engagement activities, so that any necessary troubleshooting is handled with context and cultural sensitivities in mind; and
3. Prepare a Socio-Economic Monitoring and Reporting Plan, outlining indicators, responsibilities, and community-driven mechanisms for tracking project impacts over time. Identifying Inuit preferences around monitoring and reporting should be integrated into engagement activities referenced above.

6.0 Environmental Effects and Mitigation

6.1 Valued Ecosystem and Socio-Economic Components

The proposed Valued Ecosystem Components (VECs) for the INP will be identified through the impact assessment screening process, early engagement with Hunters and Trappers Associations (HTAs), Elders, and community representatives, and review of applicable Nunavut Impact Review Board (NIRB) guidance (NNC, 2025b).

At this stage, Valued Socio-Economic Components (VSECs) have not been formally scoped. VSECs will be identified and assessed through a broader, integrated socio-economic assessment planned for 2026, informed by ongoing engagement, IQ, and advancing Project design.

However, the human environment has been considered at a high level for the purposes of early impact assessment screening, to identify potential interactions related to land use, harvesting, community well-being, and socio-economic considerations. This early screening does not constitute a full socio-economic assessment.

As consultation and engagement continue, the list of VECs and VSECs may be refined to reflect new information, IQ, and community-defined priorities.

Proposed VEC and VSEC Categories:

- Terrestrial Environment: wildlife (caribou, polar bear, migratory birds, raptors, furbearers), vegetation communities, and rare or sensitive plant species;
- Aquatic Environment: fish (char) and fish habitat, benthic invertebrates, periphyton, riparian vegetation, and surface-water quality;
- Atmospheric Environment: air quality, greenhouse-gas emissions, noise, and vibration; and
- Human Environment: health and safety, economic, country foods and harvester confidence, land use and travel safety, cultural and archaeological resources, local employment and procurement opportunities, and public and rightsholder concerns.

These proposed components will form the foundation of the effects assessment, baseline studies, and cumulative-effects analysis. Refinements to indicators, boundaries, and thresholds will occur through continued engagement, field findings, and integration of IQ to maintain alignment with community values and regulatory expectations.

The proposed VECs and VSECs are considered preliminary and will be validated and refined through continued community engagement, baseline data collection, and feedback from NIRB during the screening and scoping phases.

6.2 Potential Effects and Mitigation

Potential environmental and socio-economic effects for the INP have been identified through the EIAS scoping process and early consultation with HTAs, QIA, and community representatives. The mitigation measures outlined below are preliminary and will be refined as baseline information and design details advance.

- Fish and Fish Habitat: Possible effects include sedimentation, altered flows, and habitat fragmentation. Mitigation will include erosion- and sediment-control measures, seasonal in-water work timing windows, stabilization of disturbed shorelines, and habitat-offsetting consistent with Department of Fisheries and Oceans (DFO) policy. Adaptive management triggers will be based on turbidity, flow, and fish-use monitoring results;
- Wildlife and Vegetation: Disturbance to wildlife and habitat will be reduced through construction-timing restrictions, flight-path and access-route management, and prevention of food-waste attraction. Reclamation of disturbed areas and progressive revegetation will restore vegetation structure and function. Wildlife monitoring will verify response to noise and movement barriers;
- Atmospheric Environment: Air emissions and dust will be managed through equipment maintenance, water-based dust suppression, and vehicle-speed limits. Noise and vibration will be reduced by limiting heavy construction to daytime hours and maintaining equipment mufflers. Conditions will be monitored at sensitive receptors to confirm compliance with GN and federal standards;
- Archaeological and Heritage Resources: Ground-disturbing activities may interact with archaeological or cultural resources, including areas of archaeological significance identified near the proposed reservoir during the 2025 field assessment, as well as previously unidentified sites. Mitigation will focus on avoidance through project design refinement, completion of permitted archaeological surveys in advance of ground disturbance, and implementation of a chance-find protocol requiring work stoppage and notification of authorities if resources are encountered;
- Human Health and Country Foods: Potential exposure to contaminants such as methylmercury will be tracked through fish and water-quality monitoring. Results will be shared through plain-

language reports and community sessions with harvesters. Traditional-foods confidence will be incorporated into health-indicator monitoring and adaptive follow-up; and

- Socio-Economic Environment: Potential effects relate to workforce logistics, training access, and local participation. Mitigation focuses on Inuit employment, training, and contracting, along with early coordination with local suppliers and service providers. Engagement will continue to identify community-defined success measures for benefits distribution.

Mitigation will follow the hierarchy:

- Avoid;
- Minimize;
- Restore; and
- Offset.

Commitments will be tracked through an Environmental Commitments Register (ECR) and reviewed regularly through adaptive management to maintain alignment with project performance objectives and community expectations (NNC, 2025b).

6.3 Alternatives Considered

NNC evaluated multiple renewable-energy options through an Inuit-led “Phase Gate” process that balanced environmental, technical, social, and cultural factors. Early feasibility work identified 17 potential power-system configurations, including hydroelectric, wind, solar, hybrid, and diesel-based options (NNC, 2025a). NNC is committed to strong Inuit representation and leadership throughout all phases of the Project, reflected in the organization’s field and administrative staffing. During the first field season, NNC achieved a 70% Inuit employment rate, and Qikiqtaaluk Corporation (QC); NNC’s corporate arm maintained 50% Inuit employment in 2023 and 45% in 2024. This commitment will continue to guide hiring, training, and participation as the Project advances.

Phase 1 – Identification of Opportunities

Preliminary screening confirmed that Iqaluit’s dependence on diesel created long-term environmental and financial risks due to greenhouse-gas emissions, transport costs, and supply reliability. Findings from the Tusaqtavut Study on Inuit Land Use highlighted community interest in locally managed renewable power that advances energy independence and reflects IQ values (NNC, 2025a).

Phase 2 – Evaluation of Renewable Options

Seventeen renewable-energy configurations were assessed at candidate sites near Iqaluit. Screening criteria were developed jointly with Inuit rightsholders and included:

- technical and hydrological feasibility;
- anticipated effects on wildlife, fish habitat, and terrain;
- distance to Iqaluit and access logistics; and
- cultural and socio-economic alignment with Inuit priorities (NNC, 2025a; NNC, 2025b).

Through a ranked-ballot process, the Kuugaaluk River system site received the highest level of community support. The location offered stable hydrology, moderate proximity to Iqaluit, minimal overlap with harvesting areas, and consistency with local preferences for water-based renewable energy. QIA and community rightsholders endorsed advancing Kuugaaluk to the design phase (NNC, 2025a).

Phase 3 – Refinement of the Concept

Field programs in 2024 collected LiDAR, drone imagery, and geotechnical samples. Results indicated that the proposed dam site contained more gravel and less exposed bedrock than earlier desktop studies suggested (NNC, 2025a, p. 13). These findings guided several design adjustments:

- a smaller reservoir to reduce sedimentation and protect permafrost integrity;
- modified dam height and penstock alignment to match terrain conditions;
- evaluation of a secondary reservoir upstream to maintain generation capacity during low-flow periods; and
- consideration of supplemental wind generation to stabilize output during freeze-up or drought conditions (NNC, 2025a).

6.3.1 Adaptive and Iterative Design Approach

Project development follows an adaptive management framework consistent with NIRB guidance and the EIAS (NNC, 2025b). As new baseline, design, and socio-economic information become available, the preferred configuration will be refined to reduce effects on VECs and VSECs.

Design refinements will incorporate projected changes in climate, permafrost, and hydrology. Ongoing engagement with HTAs, Elders, and the Qikiqtani Inuit Association (QIA) will continue to shape project adjustments, keeping environmental, technical, and cultural objectives aligned (NNC, 2025a; NNC, 2025b). NNC’s commitment to Inuit leadership and participation including ongoing focus on Inuit hiring, training, and representation remains a core component of this adaptive process.

6.4 Cumulative Effects

The cumulative-effects assessment for the INP evaluates how Project-related changes may interact with other past, present, and reasonably foreseeable activities within the RSA, consistent with NIRB’s environmental assessment framework. The RSA encompasses the Kuugaaluk River system surrounding the proposed reservoir, downstream connections to Cumberland Sound, and areas used for harvesting, travel, and other land-based activities.

For screening-level purposes, the following activities identified through the screening level assessment and community engagement have been selected for inclusion in the cumulative-effects assessment:

- Transportation corridors, including all-season and winter travel routes that may influence wildlife movement, access patterns, and harvest areas;
- Quarrying and granular-resource extraction, including existing and proposed borrow sources that may contribute to terrain disturbance, dust, noise, and habitat alteration;
- Community expansion and municipal infrastructure, including growth of Iqaluit's serviced areas, waste-management infrastructure, and utility upgrades;
- Regional land use, including known harvesting areas, travel corridors, and seasonal use patterns identified by HTAs, Elders, and land users;
- Climate-driven changes, such as permafrost thaw, shifting rainfall patterns, altered freeze–thaw cycles, ice-regime changes, and resulting effects on hydrology, terrain stability, wildlife movement, and country-food access; and
- Other renewable-energy and infrastructure proposals that may emerge during the assessment period and have potential to overlap spatially or temporally with INP activities.

These activities form the basis for identifying cumulative pathways related to wildlife movement, fish and fish habitat, water quality, terrain stability, country foods, socio-economic well-being, and climate resilience.

Potential cumulative interactions include:

- Regional changes in surface-water quality or flow regimes affecting aquatic habitat;
- Incremental disturbance to wildlife movement corridors and migratory pathways;
- Combined effects on permafrost, terrain stability, sediment transport, and erosion potential; and
- Regional implications for harvesting access, travel safety, and country-food confidence.

The screening level assessment indicates that cumulative effects are anticipated to be low to moderate with the mitigation measures proposed for the Project. A full cumulative-effects analysis including refined RSA boundaries, quantified pathways of interaction, measurable indicators, and significance determination will be completed as part of the EIS. IQ and community-identified values will guide the selection of VECs and VSECs and inform the cumulative-effects evaluation across the RSA.

6.4.1 Assessment Focus and Pathways

Cumulative Effects Assessment (CEA) pathways will be examined across environmental and socio-economic domains and will include:

- Wildlife and Habitat Connectivity: potential additive disturbance from transportation corridors, quarrying, or community expansion affecting caribou movement, denning areas, and migratory bird use;
- Aquatic Systems: changes to fish habitat and water quality from overlapping land use, erosion, or runoff associated with other regional activities; and
- Human Environment: combined influences on health, country-foods confidence, and socio-economic stability where multiple projects, infrastructure, and climate pressures intersect.

Each pathway will be evaluated using NIRB criteria; magnitude, geographic extent, duration, frequency, reversibility, and context while incorporating both scientific analysis and IQ perspectives on limits and resilience.

6.4.2 Climate Change and Adaptive Management

Climate change is recognized as a cumulative driver that interacts with project effects on permafrost, hydrology, and species movement. The CEA will integrate regional climate datasets and GN projections to characterize long-term temperature, precipitation, and freeze-thaw trends. Adaptive management will be embedded in monitoring programs so that mitigation measures can be modified if environmental or socio-economic indicators diverge from expected trends.

Examples of adaptive responses include revising erosion or drainage systems in response to thaw settlement, adjusting flow management during variable hydrological conditions, or enhancing wildlife monitoring where cumulative disturbance nears community-defined thresholds.

6.4.3 IQ and Community Input

IQ and community knowledge will guide the selection of spatial boundaries, VECs, and thresholds of concern. Engagement with HTAs, Elders, and residents will identify overlapping land uses, harvesting areas, and cumulative pressures not captured through scientific datasets. Cumulative pathways will be discussed during community workshops to confirm linkages most relevant to well-being and land use.

6.4.4 Monitoring and Reporting

Cumulative effects will be tracked through an integrated monitoring framework linked to the Environmental Commitments Register. Indicators such as wildlife presence, habitat condition, air quality, and country-foods confidence will be reviewed annually with communities. Where observed conditions differ from predicted outcomes, corrective actions will be implemented through the adaptive management plan. Findings will be summarized in annual reports and shared with partners to support transparency and continuous improvement.

6.5 Accidents and Malfunctions

Potential unplanned events include fuel spills, dam breach, equipment failure, and wildfire. Emergency response plans will be developed and tested annually. Emergency response planning will be developed in accordance with territorial and federal requirements and will be informed by engagement with local communities and rightsholders prior to construction.

6.6 Fuel and Hazardous Materials Management

All fuels and hazardous materials will be stored, handled, and transported in accordance with the Transportation of Dangerous Goods Regulations (2001) and the *Canadian Environmental Protection Act* (1999). Screening-level estimates are provided in **Section 4.5.5**; final contractor-specific quantities will be confirmed later.

6.6.1 Temporary Camp

Temporary camp infrastructure will require the storage and handling of fuel and other hazardous materials to support accommodation, heating, electricity generation, vehicle and equipment operation, and general site servicing during investigative and construction activities. Fuel storage associated with temporary camps will be located within designated areas and managed in accordance with applicable regulatory requirements and standard spill prevention and response procedures. Final details respecting fuel types, storage volumes, containment measures, and transfer procedures will be developed during subsequent design and construction planning. Where feasible, camp-related fuel storage and handling areas will be sited and operated to reduce risk to nearby waterbodies, sensitive terrain, wildlife habitat, and areas identified through IQ and field studies.

6.6.2 Logistics and Storage

Construction-phase fuel will be delivered via sealift to the Iqaluit deep-water port and transported to the site via the access road. Temporary bulk storage tanks will be established at the headworks and construction camp areas. Backup generators will utilize 24-hour day tanks equipped with secondary containment and high/low-level alarms.

At this early stage, the exact types and quantities of fuel and hazardous materials required for future Project phases will be finalized through the project tendering process, when contractors provide their proposed equipment, fuel requirements, and material handling procedures.

6.6.3 Spill Prevention and Response

Spill prevention and response for the Project will be guided by Nunavut Nukkiksautiit Corporation's (NNC) Spill Prevention and Response Plan, which establishes minimum requirements for fuel storage, handling, refuelling, spill preparedness, and response procedures across all Project activities. This plan will be applied regardless of contractor-specific methods and will be updated, as required, to reflect the scope of activities for each Project phase.

NNC is committed to sharing fuel and hazardous materials information, as well as spill prevention and response procedures, with regulators and communities once details become available. The Project will require the use of secondary containment, approved storage systems, and readily accessible spill kits at all work locations, with refuelling conducted away from waterbodies where practicable.

Spill-response procedures will be documented in the Environmental Protection Plan (EPP) and reviewed with Inuit field teams prior to each field season to support preparedness and clear understanding of roles and responsibilities. Any spill that is greater than, or may be greater than, the reportable quantities under the Spill Contingency Planning and Reporting Regulations (1993) will be reported to the Nunavut Spill Report Line by the Responsible Party, in accordance with regulatory requirements.

6.7 Waste Management

Solid and liquid wastes associated with future construction and camp operations will be managed in accordance with the Nunavut Environmental Guidelines for General Management of Special and Hazardous Waste. A Project-specific Waste Management Plan will be implemented to guide the segregation, handling, storage, transport, and disposal of all waste streams generated during Project activities.

6.7.1 Waste Handling and Systems

At this early stage, the specific waste-handling systems and equipment to be used have not yet been determined and will be confirmed through the project tendering process, once contractors identify the camp infrastructure and waste-management methods they propose. NNC will provide updated information to regulators and communities as these details are finalized.

To reduce environmental risks, waste will be segregated and securely contained, with organic materials stored in wildlife-proof containers and other non-organic wastes collected for transport to approved disposal facilities.

6.7.2 Hazardous Waste and Liquids

Waste oils, lubricants, and other hazardous wastes will be managed in accordance with the Project-specific Waste Management Plan and collected for off-site disposal at an approved facility in Iqaluit or shipped south under Transportation of Dangerous Goods (TDG) manifest control, consistent with applicable regulatory requirements.

Greywater will be managed using portable or modular treatment systems suited to Arctic conditions, with the final configuration confirmed through contractor submissions. Sewage will be treated using self-contained modular units or equivalent systems proposed by the selected contractor. Routine inspections will be undertaken to verify compliance with applicable regulatory requirements and any future water-licence conditions.

6.7.3 Spill Reporting

In the event of a spill, the Responsible Party will report any spill that is greater than, or may be greater than, the reportable quantities defined under the Spill Contingency Planning and Reporting Regulations (1993) to the Nunavut Spill Report Line, in accordance with regulatory requirements.

6.7.4 Temporary Camps Waste Management

Temporary camps will also generate domestic solid waste, food waste, sewage, greywater, and other non-hazardous and hazardous waste streams during field and construction activities. Camp waste management requirements will be addressed through site-specific procedures developed for the Project and will include waste segregation, secure storage, routine collection, and removal or disposal at appropriate approved facilities, as applicable. Sanitary wastes and wastewater generated at temporary camps will be managed using temporary systems appropriate to the scale and duration of camp use and consistent with applicable permitting requirements. Following demobilization, temporary camp areas not required for ongoing Project activities will be cleaned up and restored to the extent practical.

6.8 Air Quality and Greenhouse Gases

Baseline air-quality data collected from the National Air Pollution Surveillance (NAPS) station in Iqaluit will be supplemented, where appropriate, by site-specific monitoring at the proposed powerhouse and camp areas. Air quality parameters to be considered include nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter ($PM_{2.5}$ and PM_{10}), and carbon dioxide equivalents (CO_2e).

Air dispersion modelling using AERMOD will be conducted to predict potential localized effects associated with construction-phase dust and emissions, as well as operational sources where applicable. Model results will be compared against the Canadian Ambient Air Quality Standards (CAAQS) to support the identification of mitigation measures and confirm regulatory compliance.

Preliminary energy modelling indicates that the Project has the potential to significantly reduce diesel-based electricity generation at the Iqaluit power plant. Quantitative estimates of diesel displacement and associated greenhouse gas reductions will be confirmed through detailed operational modelling and will be reported in subsequent regulatory submissions as project design advances.

7.0 Engagement, Consultation, and Authorizations

7.1 Engagement Summary

Engagement for the INP is guided by Inuit leadership, transparency, and ongoing dialogue. NNC applies a "Phase Gate" engagement model, where Inuit rightsholders, community members, and technical partners participate in decision-making at each project milestone (NNC, 2025a). A core principle of this model is meaningful Inuit participation including employment, training, and leadership throughout all stages of the Project. During the 2025 field season, NNC achieved a 70% Inuit employment rate, and QC has maintained 50% Inuit employment in 2023 and 45% in 2024, demonstrating strong and consistent representation of Inuit in project operations. This commitment forms the foundation for expanding Inuit hiring, mentorship, and skills development as the Project advances. Engagement and consultation activities undertaken to date include:

- Rightsholder and Community Decision-Making (2023–2025): Through a ranked-ballot process, QIA, HTAs, and Iqalungmiut selected the Kuugaaluk River system as the preferred hydropower site after reviewing 17 renewable-energy options. This process marked a formal decision gate under NNC's Inuit-led project framework (NNC, 2025a);
- Information Sessions and Community Updates: NNC and project partners hosted information sessions with Iqaluit and Pangnirtung HTAs, local leaders, and residents to present field findings, discuss environmental values, and gather feedback on study design. Sessions emphasized two-way dialogue and incorporated IQ perspectives on wildlife, fishing areas, and travel safety (NNC, 2025a);
- Workshops with Elders, Youth, and Land Users: Elders and youth contributed knowledge on culturally significant areas, seasonal wildlife movement, and preferred baseline study locations. This input has guided the design of aquatic, wildlife, and permafrost field programs, as well as the early development of visual impact materials for community review;
- Plain-Language and Bilingual Materials: NNC developed and distributed the Let's Talk Water Power/ᐅᖃᓪᓚᖃᑎᒌᒃᑕ ᐃᒪᕐᒥᑦ ᐆᒻᒪᕐᑯᑎᖃᐅᑎᖃᕐᓂᖅ booklet across Qikiqtani communities to explain hydropower concepts, site findings, and next steps in both English and Inuktitut (NNC, 2025a). The booklet supported dialogue on energy needs, environmental priorities, and community expectations for renewable-power development; and
- Integration of IQ and Local Knowledge: IQ has been embedded in the planning and execution of field programs, including wildlife, fish habitat, and aquatic surveys. Community knowledge supports the identification of VECs and VSECs, particularly those related to country foods, land use, and cultural continuity.

8.0 Integration of Inuit Qaujimajatuqangit (IQ)

The Project is being advanced as an Inuit-led initiative intended to support long-term energy security for Iqaluit, reduce reliance on imported diesel fuel, and create meaningful opportunities for Inuit participation in Project planning, construction, operations, and monitoring. Specific benefit pathways, employment approaches, and community-based programs will be further developed in collaboration with Inuit organizations and communities as Project planning and assessment advance.

The incorporation of IQ into the INP is an ongoing process and is not considered complete at this stage. IQ will continue to serve as a foundational element throughout all phases of Project development. As design work progresses, baseline programs expand, and engagement with Inuit partners deepens, additional IQ will be identified and integrated into Project decision-making. Inuit values, harvesting knowledge, cultural priorities, and land-based insights directly inform how the Project is conceived, evaluated, and refined. Consistent with NIRB expectations, the following subsections describe the specific ways in which IQ has informed and influenced Project decisions to date.

8.1 Influence of IQ on Site Selection and Project Alternatives

IQ highlighted the importance of selecting a site with:

- minimal overlap with high use harvesting areas;
- limited interaction with major inland travel routes; and
- avoidance of culturally sensitive landforms such as eskers and historical camps.

During Inuit-led screening of sixteen renewable energy options and multiple hydroelectric locations, communities identified the Kuugaaluk River system as the site least likely to interfere with active harvesting or culturally meaningful travel corridors. As a result, several technically feasible alternatives such as Nunngarut and Jaynes Inlet were removed from consideration due to IQ-identified concerns related to cultural use, wildlife congregation areas, and winter travel safety.

Design implication: The INP's current location reflects IQ-led site screening outcomes, not only technical or engineering feasibility.

8.2 Road and Transmission Line Routing Refined Using Inuit Qaujimajatuqangit

Through mapping sessions, Elders and harvesters identified:

- known caribou movement corridors;
- water crossings traditionally used during winter travel;
- areas with unstable snow and ice conditions; and
- landscape features (e.g., eskers) used for navigation or cultural purposes.

This knowledge informed a series of design refinements:

- Primary access road alignments were shifted to avoid key caribou routes observed by Inuit monitors and confirmed during 2025 field programs;
- Transmission line corridor options excluded areas identified as high confidence harvesting zones and raptor nesting habitat; and
- Quarry locations and camp sites were adjusted to avoid berry-picking areas, small-game hunting sites, and culturally important landforms.

Design implication: Micro-routing and corridor selection now incorporate IQ-derived constraints on an equal basis with technical and environmental criteria.

8.3 Seasonal Timing of Activities Informed by Harvesting Knowledge

IQ from HTAs and harvesters resulted in the integration of seasonal considerations into planning and scheduling, including:

- avoiding disturbance during caribou migration, calving, and fall harvesting periods;
- planning in-water work outside of Arctic char migration and spawning windows documented through community interviews;
- adjusting aerial surveys to avoid periods when low-flying aircraft disrupt waterfowl staging or harvesting; and
- scheduling quarry and road work to reduce interactions with winter snowmobile routes that support inland travel and country food harvesting.

Design implication: Field programs, construction sequencing, and access planning incorporate seasonal timing windows defined through IQ.

8.4 Changes to Aquatic Design Based on Inuit Knowledge of Fish Movements

Community meetings and harvester interviews provided information on:

- upstream and downstream char migration pathways;
- overwintering pools;
- areas prone to ice instability; and
- preferred harvesting locations.

This knowledge influenced several elements of aquatic design:

- Fish passage considerations (e.g., fish ladder or alternative structures) were included at the conceptual stage;
- Instream Flow Requirements were informed by community-defined flow patterns rather than modelled hydrology alone; and
- Baseline water quality stations were sited at locations identified by harvesters as sensitive or seasonally variable.

Design implication: IQ directly shaped dam, spillway, and flow-release concepts well before detailed engineering.

8.5 Caribou Corridor Protection Through Design Refinement

IQ provided clarity on caribou use areas not captured through 2025 camera data alone, including:

- traditional herd movement routes between inland feeding zones and coastal areas;
- areas of avoidance near human activity; and
- localized slopes and snow conditions that influence travel.

As a result:

- Several road alignment options on the south and west sides of the reservoir were removed from consideration;
- Monitoring design now includes IQ-defined disturbance indicators, such as behavioural changes or altered crossing locations; and
- Buffer distances in the EIAS reflect IQ-derived tolerances, with further community review planned before finalizing the EIS.

Design implication: Linear infrastructure placement reflects both IQ and western wildlife modelling, giving equal weight to community-based knowledge.

8.6 Cultural and Archaeological Protection Guided by Inuit Qaujimajatuqangit

IQ contributed detailed understanding of:

- long-used travel routes;
- former camps, tool-making areas, and food preparation sites; and
- areas with high potential for buried archaeological materials.

In response:

- Archaeological reconnaissance methodologies were co-developed with Inuit monitors;
- Access routes and temporary camp footprints were shifted to avoid culturally sensitive areas; and
- Stop-work and heritage resource procedures were updated to align with community expectations on how to respectfully handle newly discovered cultural materials.

Design implication: Cultural protection and avoidance measures are informed directly by IQ, rather than relying solely on post-discovery mitigation.

8.7 Shaping the VEC Framework Using Inuit Qaujimajatuqangit

IQ shaped the selection and definition of several VECs and socio-economic indicators, including:

- travel safety and reliability as a distinct valued component;
- confidence in country foods as a human health indicator;
- visual landscape character linked to harvesting experience and sense of place; and
- noise and vibration thresholds aligned with harvester experience rather than generic standards.

Design implication: Several VECs, particularly those relevant to human use—exist because IQ identified them as central to community well-being.

8.8 Monitoring and Adaptive Management Co-Developed with Inuit

IQ has also guided the approach to monitoring and adaptive management by ensuring:

- Inuit monitors are embedded across all baseline programs (wildlife, aquatic, terrestrial, permafrost);
- community knowledge defines thresholds and triggers for adaptive management (e.g., unacceptable changes in caribou or char behaviour); and
- annual data review sessions with Inuit partners will guide iterative refinement of design and mitigation.

Design implication: Monitoring programs respond to community-identified concerns and integrate IQ-defined indicators alongside technical parameters.

9.0 Environmental Management System

The Project will be guided by an Environmental Management System (EMS) that provides a structured approach to identifying and managing potential environmental effects throughout construction, operations, and decommissioning. Environmental effects will be addressed through established mitigation approaches, including avoiding impacts where feasible and minimizing disturbance where avoidance is not possible. Monitoring and routine inspections will be used to track environmental performance and support adaptive management, allowing mitigation measures to be adjusted as needed. The EMS will include periodic review of environmental practices and performance to support continuous improvement and alignment with regulatory requirements. Updates to procedures and mitigation measures may be made based on monitoring results, operational experience, and regulatory feedback.

To support implementation, the Project will develop and maintain a suite of component-specific Environmental Management Plans. Each plan will define roles and responsibilities, mitigation measure, monitoring requirements, and reporting protocols relevant to the specific environmental aspect being managed.

A list of potential environmental management plans is outlined in **Table 16**.

Table 16: Potential Environmental Management Plan for the Project

Environmental Management Plan	Plan Content
Spill Prevention and Response Plan	Details measures to prevent spills of fuels and hazardous materials, as well as response protocols to contain and remediate any releases.
Waste Management Plan	Outlines procedures for waste segregation, storage, transportation, and disposal to prevent environmental contamination and wildlife attraction.
Erosion and Sedimentation Control Plan	Outlines how a project will manage soil disturbance to prevent erosion and stop sediment from entering nearby water bodies during construction and site activities.
Wildlife Mitigation Plan	Includes measures to avoid or minimize interactions with wildlife and protect sensitive habitats;
Water Management Plan	Addresses water use, protection of surface and groundwater, and management of runoff and wastewater.

10.0 Closing

This Project Proposal has been prepared to support NIRB screening of the current proposed Project configuration. The information presented reflects the Project design basis, baseline information, and planning assumptions available at this stage.

Several Project elements remain subject to refinement through investigative studies, engineering review, Inuit engagement, environmental fieldwork, Nunavut Water Board licensing, land use permitting, and other applicable regulatory processes. Where final construction-level details are not yet available, this submission identifies the current screening basis and the process through which additional information will be developed.

NNC will continue to update Project information as design, baseline studies, engagement, and regulatory review advance. If future refinements materially change the Project footprint, water use, fuel storage, discharge management, construction approach, or potential environmental and socio-economic interactions, NNC will provide updated information to NIRB and applicable regulators before advancing the affected activity.

DILLON

Appendix A

IAAC Response - Iqaluit Nukkiksautiit Project

Roche, Michelle <mroche@dillon.ca>

Iqaluit Nukkiksautiit Project

PNR / RPN (IAAC/AEIC) <pnr-rpn@iaac-aeic.gc.ca> 5 November 2025 at 19:35
To: "Roche, Michelle" <mroche@dillon.ca>, Jill Byrne <jbyrne@qcorp.ca>
Cc: "Lachine,Tracy (IAAC/AEIC)" <Tracy.Lachine@iaac-aeic.gc.ca>, "Lefebvre,Allisson (IAAC/AEIC)" <Allisson.Lefebvre@iaac-aeic.gc.ca>, "PNR / RPN (IAAC/AEIC)" <pnr-rpn@iaac-aeic.gc.ca>, "Federal Lands / Territoire Domanial (IAAC/AEIC)" <FederalLands-TerritoireDomanial@iaac-aeic.gc.ca>

Hi Michelle and Jill.

It was great to meet you both. Thank you for providing us with the introduction to the project

As discussed in our meeting, the *Physical Activities Regulations* are not triggered by the project. Given this, we would not be assessing the project any further and do recommend that you continue your conversations with NIRB. Regarding your questions to federal funding and questions that relate to section 81-91 of the *Impact Assessment Act*, please see below.

The obligations under sections 81 to 91 of the IAA would apply to non-designated projects on federal lands, including posting public notices on the Canadian Impact Assessment Registry and conducting an environmental effects determination, while considering the factors listed under section 84 of the IAA. We would strongly encourage you to reach out to the responsible authority.

I have included our colleges with the Federal Lands team of our Legislative and Regulatory Affairs department (federallands-territoiredomanial@iaac-aeic.gc.ca) and they would be happy to assist you in determining whether section 82 of the IAA applies to this project. If section 82 of the IAA is not applicable to this project, then there is no need to post the project to the Registry at this time.

For more information, please refer to the IAAC guidance for projects on federal lands: Projects on federal lands and outside Canada: Guidance on Sections 81 to 91 of the Impact Assessment Act - Canada.ca .

Further information on the IAA and associated regulations can be found at https://www.canada.ca/en/impact-assessment-agency.html.

Kindly let me know if you have any further questions.

Sincerely,

Param Joshi

(he/him|il)

Policy Analyst, Prairie and Northern Region
Impact Assessment Agency of Canada / Government of Canada
Param.Joshi@iaac-aeic.gc.ca / Tel: 587-340-2336

Analyste des politiques, Région des Prairies et du Nord
Agence d'évaluation d'impact du Canada / Gouvernement du Canada
Param.Joshi@iaac-aeic.gc.ca / Tél. : 587-340-2336

DILLON CONSULTING

Roche, Michelle <mroche@dillon.ca>

Iqaluit Nukkiksautiit Project

PNR / RPN (IAAC/AEIC) <pnr-rpn@iaac-aeic.gc.ca> 24 November 2025 at 13:48
To: "mroche@dillon.ca" <mroche@dillon.ca>
Cc: "Federal Lands / Territoire Domanial (IAAC/AEIC)" <FederalLands-TerritoireDomanial@iaac-aeic.gc.ca>, "jbyrne@qcorp.ca" <jbyrne@qcorp.ca>, "PNR / RPN (IAAC/AEIC)" <pnr-rpn@iaac-aeic.gc.ca>

Hi Michelle,

Thank you for reaching out to our federal lands team.

I believe our earlier communication may have caused some confusion, so I would like to clarify the following:

Because the project is located within the Nunavut Settlement Area, the *Impact Assessment Act* (IAA) does not apply, in accordance with section 7 of the *Nunavut Planning and Project Assessment Act*. The IAA is not applicable in the Nunavut Settlement Area or the Outer Land Fast Ice Zone. As a result, the IAA does not apply regardless of whether the project would otherwise be considered a designated project under the *Physical Activities Regulations* of the IAA or is situated on federal lands (i.e., section 82 of the IAA does not apply).

We appreciate you doing your due diligence and should you need anything further please let us know.

Sincerely,

Param Joshi

(he/him|il)

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From: Roche, Michelle <mroche@dillon.ca>
Sent: Thursday, November 13, 2025 8:19 AM
To: Federal Lands / Territoire Domanial (IAAC/AEIC) <FederalLands-TerritoireDomanial@iaac-aeic.gc.ca>
Cc: Jill Byrne <jbyrne@qcorp.ca>
Subject: Fwd: Iqaluit Nukkiksautiit Project

Good Morning,

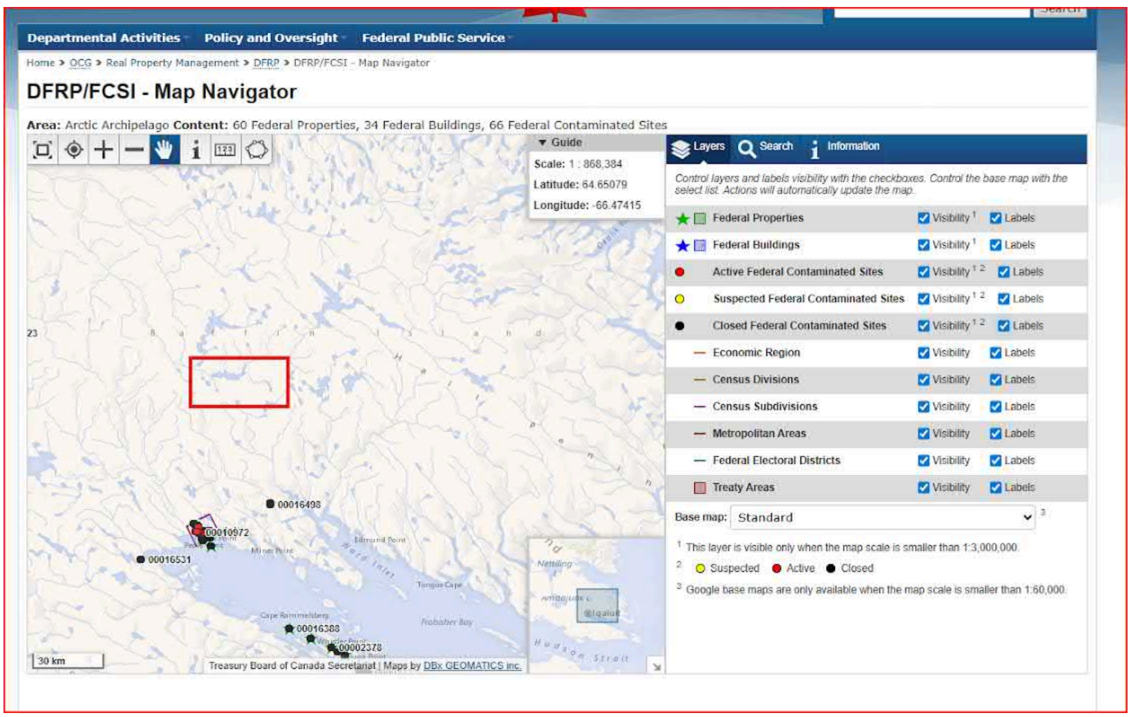
Following our recent meeting with the Impact Assessment Agency of Canada (IAAC), it was confirmed that the Physical Activities Regulations are not triggered by the project.

In an effort to complete our due diligence, I have reviewed the Directory of Federal Real Property (DFRP) and can confirm that no federal lands have been identified within the project footprint (see below).

We would, however, like to confirm with your team that there are indeed no federal lands associated with this project and that the obligations under Section 82 of the Impact Assessment Act (IAA) do not apply. I have attached a figure outlining the project footprint below.

Please let us know if you require any additional information to support this confirmation.

Latitude 64.17054 Longitude -67.91505



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