NIRB Application for Screening #125835
Cambridge Bay Water Safety Research

Application Type:	New
Project Type:	Scientific Research
Application Date:	7/4/2023 2:13:06 PM
Period of operation:	from 0001-01-01 to 0001-01-01
Proposed Authorization:	from 0001-01-01 to 0001-01-01
Project Proponent:	Caroline Duncan 134 Adelaide St E Toronto Ontario M5C 1K9 Canada Phone Number:: 4373283009, Fax Number::

DETAILS

Non-technical project proposal description

English: Who: York University, Caroline DuncanWhat: This project will consist of water sampling and workshop activities as part of Caroline's PhD research looking at optimizing water safety in Cambridge Bay through participatory modelling. The central research question explored in this project is: Can access to safe drinking water in Cambridge Bay be improved using participatory system dynamics modelling? The two main goals of the project are to collect quantitative and qualitative data that will be used to build the model and to use the model to identify water management, treatment, and policy leverage points that can be used to improve access to clean and safe drinking water for Cambridge Bay residents.Key objectives:1.Conduct an in-depth desktop review of water safety policy regulations and frameworks in Nunavut and water quality and operational records in Cambridge Bay 2.Identify technical water safety problems throughout the water system in Cambridge Bay from source to tap by assessing existing infrastructure and in-situ operational procedures and by collecting water quality samples from multiple points within the system 3.Gather qualitative data related to water access, policy, governance, and cultural considerations via participatory stakeholder engagement activities like public forums and focus groups4.Use participatory system dynamics modelling to identify key technical, policy, and cultural leverage points, weigh the risk of different safety water hazards, and ultimately improve water treatment and water policy in Cambridge Bay. Once the stakeholders have validated the baseline model, the model will be manipulated by the researchers and the stakeholders to explore how technical and policy changes could lead to improved access to clean and safe drinking water for the residents of Cambridge Bay.Water Sampling:Caroline Duncan employed youth will take water samples from the water source, multiple points within the water treatment plant (before and after filtration; after UV disinfection; after initial chlorination; within the storage tank; and during water truck filling); distribution, and from the cisterns and taps in 10 to 12 buildings in the community. Community members will be asked if they would like to volunteer for sampling in advance. Individuals that would like to volunteer will be required to allow researchers to access their cisterns and taps for a short period that is convenient for them. Water samples will be analyzed for standard water chemistry parameters, metals, and bacterial content. Samples will be analyzed in-house at the Canadian High Arctic Research Center by the students for basic water quality analysis and sent to an accredited lab for more extensive analysis. Each month approximately 70 samples will be taken. Approximately 840 L of water will be collected within the year for sampling. A CGS employee will be available to support the students with monthly sampling and analysis.Workshops:Caroline will organize workshops in Cambridge Bay to assess water system risks and factors impacting water safety. Subsequently, she will develop a dynamic model of the water system. The workshops will also share the water quality data collected by the employed students These students will help Caroline run the workshops. Why: water safety research in Nunavut is crucial for ensuring access to safe drinking water in the communities, the holistic approach of this project goes beyond regulations, actively involving communities in understanding their water systems and recommending improvements. This participatory approach fosters ownership and long-term sustainability. Capacity building is a key focus, employing students to receive water operator training and certification and establishing a potential succession plan for water plants. This investment in youth not only promotes personal development but also local employment and expertise. The research's impact is far-reaching. It will identify weaknesses and areas for improvement by integrating socioeconomic, cultural and political factors. Enabling Cambridge Bay to apply for funding more effectively in water infrastructure. The project aligns with the evolving field of drinking water engineering, addressing disparities between remote and urban areas.The goal is to optimize water safety, bridging health and environmental gaps in Cambridge Bay. Co-creating interventions through quantitative analysis and participatory methods is hypothesized to improve overall water safety in Cambridge Bay. This project sets a precedent for inclusive and sustainable water management in the North. Where: The water sampling activities will be held within the municipal boundaries of Cambridge Bay. Workshop activities will be held in Cambridge Bay and Iqaluit to include Government Stakeholders. When: Water sampling will occur monthly from Nov 2023-2024, while workshop activities are scheduled from Nov 2023-March 2025.

French: N/A

Inuktitut: N/A

Inuinnaqtun: Kina: York Ilihaqpaalliqviat, Caroline DuncanHuna: Hapkunani havaagharnit imarmik qauyihainiaqtut ayuiqhaqtitaulutiklu hulilukaaqhutik ilauplutik taaffuma Caroline-ngum PhD-nut qauyihaqtainut imaqmiittaamik qayangnaiqhimayaamik Iqaluktuuttiaqmi ilaupkaiplutik. Qitqaninngaalluaqtuq apiqhuutauyuq ihivriuqtauniaqtuq hapkunani havaagharnit: Amirnaittumik imaqaqtitauyaamik Iqaluktuuttiaqmi ihuaqhivaallirniaqqa ilaupkaiplutik havauhiqaqhutik? Malruk inirimalluaqtait havaagharnit hapkunani taimaa katitirilutik amigaittunik nakuuyuniklu naunaitkutighanik atuqtauyughat hanayunit

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Personnel

Personnel on site: 3
Days on site: 30
Total Person days: 90
Operations Phase: from 2023-11-01 to 2025-08-31

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Location for various water sampling points	Sampling sites	Municipal	N/A	N/A	Cambridge Bay

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Cambridge Bay	Jim McEachern	Municipality of Cambridge Bay	2023-04-05

Authorizations

Indicate the areas in which the project is located:

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Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	License to perform research activities in Nunavut	Not Yet Applied		
Other	Ethics Board for ethical approval from York University	Not Yet Applied		
Nunavut Water Board	Water license for research purposes	Applied, Decision Pending		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Land		

Project accomodation types

Community

Material Use

Equipment to be used (including drills, pumps, aircraft, vehicles, etc)

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Sample Bottles	3000	1L	Samples bottles for water collection will be of various size, between 250 ml and 1 L. It is not anticipated that this research will exceed 5 m3 water use.

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Information is not available						

Water Consumption

Daily amount (m3)	Proposed water retrieval methods	Proposed water retrieval location
0		

Waste

Waste Management

Project Activity	Type of Waste	Projected Amount Generated	Method of Disposal	Additional treatment procedures
Information is not available				

Environmental Impacts:

Water sampling events will provide a big picture of the water quality from source to tap in Cambridge Bay. Youth will be hired to take water samples, which will positively impact employment. Additionally, by taking water samples from various locations within the drinking water system, we will be able to identify areas to recommend improvements to drinking water infrastructure and indirectly have a positive impact on human health.

Additional Information

SECTION A1: Project Info

SECTION A2: Allweather Road

SECTION A3: Winter Road

SECTION B1: Project Info

SECTION B2: Exploration Activity

SECTION B3: Geosciences

SECTION B4: Drilling

SECTION B5: Stripping

SECTION B6: Underground Activity

SECTION B7: Waste Rock

SECTION B8: Stockpiles

SECTION B9: Mine Development

SECTION B10: Geology

SECTION B11: Mine

SECTION B12: Mill

SECTION C1: Pits

SECTION D1: Facility

SECTION D2: Facility Construction

SECTION D3: Facility Operation

SECTION D4: Vessel Use

SECTION E1: Offshore Survey

SECTION E2: Nearshore Survey

SECTION E3: Vessel Use

SECTION F1: Site Cleanup

SECTION G1: Well Authorization

SECTION G2: Onland Exploration

SECTION G3: Offshore Exploration

SECTION G4: Rig

SECTION H1: Vessel Use

SECTION H2: Disposal At Sea

SECTION I1: Municipal Development

Description of Existing Environment: Physical Environment

Description of Existing Environment: Biological Environment

Description of Existing Environment: Socio-economic Environment

Miscellaneous Project Information

Identification of Impacts and Proposed Mitigation Measures

Cumulative Effects

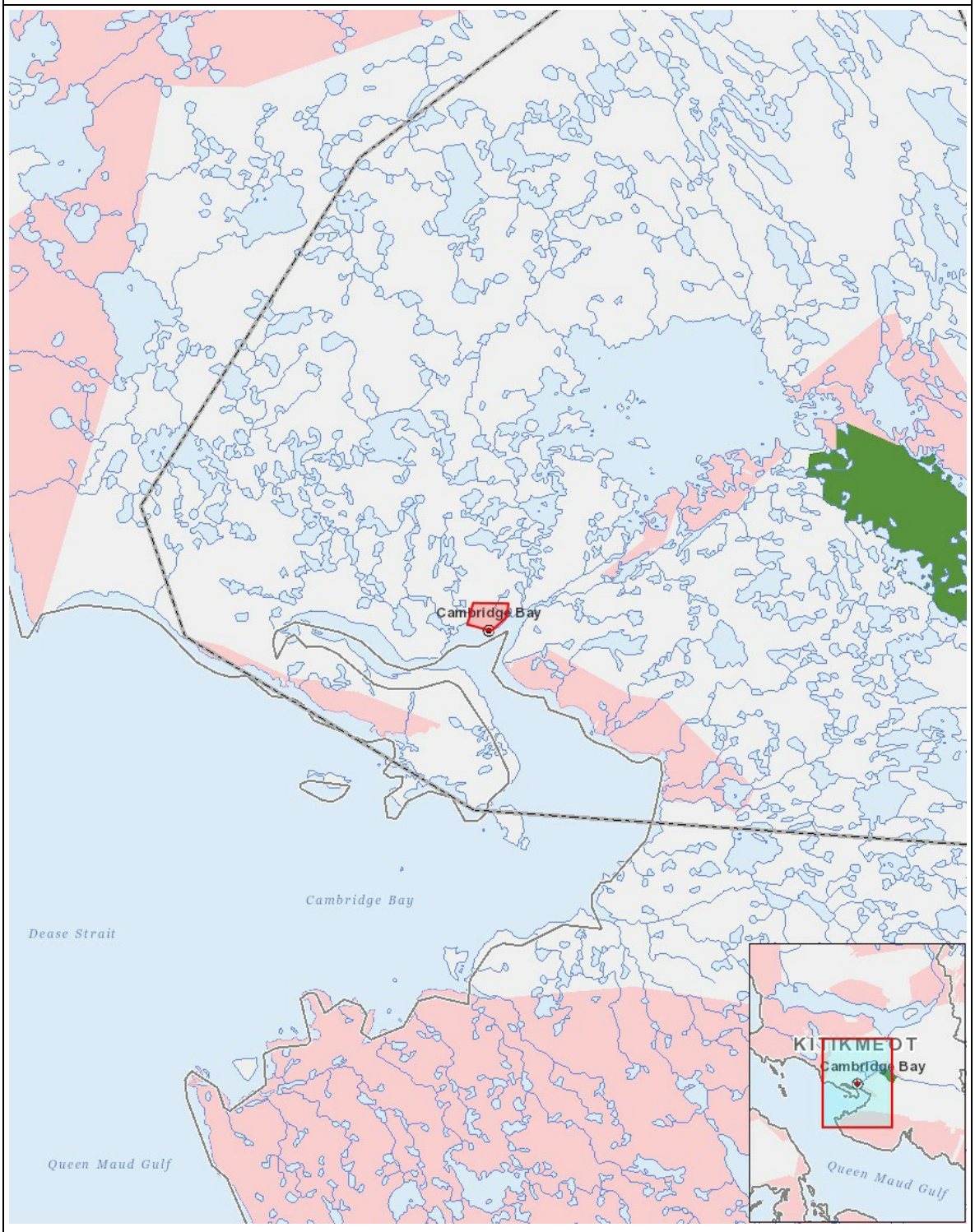
Impacts

Identification of Environmental Impacts

	PHYSICAL	Designated environmental areas	Ground stability	Permafrost	Hydrology / Limnology	Water quality	Climate conditions	Eskers and other unique or fragile landscapes	Surface and bedrock geology	Sediment and soil quality	Tidal processes and bathymetry	Air quality	Noise levels	BIOLOGICAL	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	SOCIO-ECONOMIC	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
Construction																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-
Operation																									
Sampling sites		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	P	-	P	P
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

(P = Positive, N = Negative and non-mitigatable, M = Negative and mitigatable, U = Unknown)

Project Location



List of Project Geometries

1	polygon	Location for various water sampling points