NIRB Application for Screening #126243

ArcSolution: Emerging Pollutants and Health in the Arctic

Application Type: New

Project Type: Scientific Research

Application Date: Wednesday, October 15, 2025

Period of operation: from 2025-09-20 to 2027-03-31

Project Proponent:

Xing Song
Memorial University of Newfoundland
240 PRINCE PHILIP DR
St. john's NL A1B 3X7
CA
Phone Number:: +17097252346, Fax Number::

DETAILS

Non-technical project proposal description

English: Project Title: ArcSolution: Arctic Pollution in a One Health Perspective–from Complex Challenges to Sustainable SolutionsShort Title: ArcSolution: Emerging Pollutants and Health in the Arctic PI: Bing Chen, Memorial University of NewfoundlandBackground, Research Questions and Objectives:The Arctic is warming about twice as fast as the global average, causing permafrost thaw, shifting ice patterns, and more extreme weather. These changes, together with pollution from distant sources and local activities like fuel handling, shipping, and lagoon retention, increase the risk of exposure to emerging contaminants in Cambridge Bay.The key contaminants of concern include:•Microplastics: tiny plastic pieces that persist and move through food webs.•PFAS: very stable man-made chemicals used in firefighting foams and many products.•Oil-related compounds: linked to fuel use and marine activity.•PBDEs: flame retardants that accumulate in people and animals and may affect health.Many of these substances travel long distances, break down slowly in cold environments, and may build up in traditional food chains. Building on earlier Northern Contaminants Program work that found PBDEs in nearby regions, this project will identify which contaminants are present around Cambridge Bay, how seasons and climate affect them, and whether they accumulate in species important for food and culture. Our goal is to understand patterns, movement, and potential impacts on food security, and to develop practical responses with local partners. Why This Study MattersCambridge Bay's coastal environment is especially vulnerable because climate change increases both the mobility and persistence of pollutants. Thawing permafrost and changes in water flow can release old, stored contaminants, while lagoons and nearshore areas can trap pollution and later release it back into the environment. Emerging contaminants that remain in the ecosystem for long periods may have more opportunities to enter the food webs that Indigenous communities rely on.There is still limited understanding of how these contaminants behave across seasons, how they build up in animals, and how they may affect local diets. This project, supported by Canada's New Frontiers in Research Fund (NFRF) and embedded in a global framework led by the European Union, will fill that gap. By comparing results from Cambridge Bay with other Arctic regions, the project will help create more effective local strategies and contribute to international efforts to protect northern communities from emerging pollution risks in a rapidly changing climate.Where, When, and How Long the Field Research Will Take Place:Fieldwork will focus on Cambridge Bay, the lagoon, and nearby coastal areas where pollutant inputs and accumulation may affect community resources. We plan three to four sampling trips each year to capture seasonal differences. Early meetings with the community will help set priorities and plan logistics. Vessel support from the Arctic Research Foundation will help us access both nearshore and remote sites.Methods:With guidance from local partners/community, we will collect water, sediment/soil, permafrost, and biological samples. We will study microbes and microalgae, and we will only obtain fish from local harvests following the DFO scientific-sampling licence process. In the lab, we will reproduce Arctic-like conditions to see how pollutants change over time, move through simple food chains, and build up. We will combine field observations with lab results to understand possible effects on key dietary species and to identify safe, culturally appropriate response options.Regulators and Permits:Following discussions with the Nunavut Planning Commission (NPC) and based on their referral, this scientific research project will obtain the required approvals from:•Nunavut Impact Review Board (NIRB): environmental screening•Nunavut Research Institute (NRI): research licence.•Fisheries and Oceans Canada (DFO): biological (fish) sampling permit.•Nunavut Water Board (NWB): water-related approvals How, When, and With Whom Results Will Be Shared in Nunavut:Results will be shared throughout the project with the Cambridge Bay community and territorial stakeholders. In collaboration with local Inuit partners,including the Kitikmeot Inuit Association, the Hunters and Trappers Organization, and Hamlet leadership — we will jointly interpret findings. After each seasonal campaign, interim results will be shared through community meetings, plain-language summaries, and feedback sessions with elders, youth, and other knowledge holders.Final products, including contamination maps, food-web risk assessments, and mitigation recommendations, will be co-developed to support local decision-making. We will also report on training and capacity-building outcomes and provide final reports to territorial and regional authorities to support environmental stewardship and policy development.

French: N/A

Inuktitut: N/A

Inuinnaqtun: Havaakhaq Atia: ArcSolution: Ukiuqtaqtumi Halumailrua iluani Atauhiq Aanniaqtailinikkut Ihumagijaujuq-uvanngat Ajurnaqtuq Ajuqhautit Atuqhimakhaaqtakhainit Akuniraalungmik Ihuaqhaidjutikhat PI: Bing ChenMemorial Iliharvigjuangat NewfoundlandmiKangiqhidjutit, Qaujihainirnut Apiqhuutit unalu Hulidjutikhat:Hamna Ukiuqtaqtuq uunnakpallialiqtuq malruiqtarnigut hilarjuami aktilaangit, taimaa nuna iluani qiqumaningit auktuqpallialiqhuni, hikut aallannguqpallialivlutik, hila ajurnaqpialiqhunilu atauttikkut halumailiqpalliavlunilu agjaqtuqtunut, aallanngurniq pihimmaarnirlu. Hapkuat aallannguqtirningit, ilagivlugillu tamarmik atukhaarnirnut ihumagijaujut uvvalu qanilruani ikajuutit imaatut uqhurjuat munarijarningit, umiaqtuqtunut hulidjuhiit, unalu kuvvirarvingillu tutquumavingit, taimaa hivuuranaqpalliavluni halumailruanit Iqaluktuuttiami. Hapkuat halumailruangit ihumaaluutaulluaqtut: •Mikitqijaujut palaastiit: mikijunnuit palaastiit ilakuit hivitunia nungulaikhimakhaaqtut ingutaalaaqhutik niqinut nirijuktainut. •PFAS: Aallanguqtaaqtut piliuqhimajut hivuuranaqtut atuqtauvaktuq qaptirijiit puplaktuqtut uvvalu aalltqiit hunanut.•Uqhurjuanut-ilagijaujut ilaurutaujut: ilakuit katilviujut uqhurjuanut atuqtunut unalu imarmiuttat hulidjuhiit. •PBDEt: ikulaitkutikhat angiglilaaqtut inungnut huradjanullu hulaqutiqaqtut inungnut. Amihut haffumani ilakuit ingilrakhaalaaqtut ungahiktunut, nungutpalliattaaqturlu kajumiittunnuamik alappaarnaqtumi, katitirlutiglu pitquhikkut niqitigut niridjutainun. Havakhugit kinguani havaktauhimajut hapkunannga Ukiuqtaqtumi Halumailrut Pinahuagutit taapkua ilitturijut PBDEt hanianit aviktuqhimajumi, una havaakhaq (havaqatigivlugillut ukunanngat Ukiuqtaqtumi Qaujiharniq Tunngavia) naunaiqhiilaaqtut hup halumailruat ittut haniani Iqaluktuuttiaq, qanuq hilaqutit unalu hilaup hilaqutigijait, qanuq katitiqhimajut uumajunit ihumagijaujut niqinut pitquhinullu. Tikinnahuarutijut ihivriurlugit qanurinningit, aulaniit, hulaqutainun niqailiunirmun, piliurlutiglu ihuaqtunik ihuaqhaidjutikhanik havaqatigilugit nunamingni havaqatigiit. Ihumaliurutinga Atauhiq Aaninaqtailiniq piyuq ihivriuriami atajut avatinganit, huradjat, inungnullu aanniaqtailininga. Anginiqarnia uumani qaujiharutimi Iqaluktuuttiap hinaa avataita ihumaaluutaulluarijaat hila uunnakpallialirmat angiglivallaarmat tamarmik ingutaaqtunut unalu angijaaqtumik halumailrungit. Mahaktiliraangat nunap puvitquumaninga imaalu aallangurningit imaqarviit hiamittiqtittivaktut utuqqanik hivuagut tutquqtauhimajunik halumailrunik, kuvirarviit imaalu haniani hinaani katitirivaktut imaalu qakugu hiamitiqtitivaktut halumailrunik. Halumailrut taapkua aulanngittut avatiptingni hivitujumik uvvalu itirlutik niqinun niridjutainun atuqtaujut Nunaqaqqaaqtut nunallaat. Piqanginmat naunaijaqhimajunik kangiqhimadjutinik inmi ukiup ilaani idjuhiit, qanuq katitiqhimajut uumajuni, uvvalu inmi hulaqutainun nunamingni nirijainun pidjutaujuq angijumik ajuqhautinik ilitturihimanikkut qajangnautinik uvvalu piraarnirmik kiudjutinik. Una havauhikhaq pipkaidjutijuq European Union-mit ittuq uumani nunarjuaptingni aadjikutariiktumik tunngavinga, ikajuqtaupluni Kaanataup Nutaangujuq Kiglingit Qaujiharnirnut Manngit (NFRF), pipkaidjutijuq naunaijaqtamingnik Iqaluktuuttiamit naunaijariami tahapkununga aallanit Ukiuqtaqtumi aviktuqhimajunit. Pijaangat anginirmik tautuktuujaarutikharnik ihuarjuumiqtittinniaqtun akhuurnaqtunik ikaarnikharniglu, pijaangat ihuaqhaidjutikharnik aturiaqaqtunik hanaqidjutikharnik nalaumajut nunallaani pidjutikharnik taimaa aittuihimaaqtillunik nunarjuaptingnik pidjutikharnik aulattittijaangat ajurnairutikharnik atugakharnik ukiuqtaqtuniittunik nunallaangit aulajut nuutaanik halumairungnik ajurnautiqaqtunik talvuuna qilaminnuaq aallannguqtiliqtunik hila.Humi, Qanga, unalu Qanuq Hivitunikhaat Manirarmi Qaujihaivikhaat Pinahuaqqa:Maniqqami havaaq hivunigijakhaat Iqaluktuuttiaq, kuvvirvianit, unalu haniani hinaani, humiliqaak humi tikipkainiq uvvalu katitirningit halumailrut hulaqutauniaqtut nunallaat ikajuutainun. Ihuaqhaivaktugut pingahunik hitamanigluuniin naunaijainikkut aulaarutinik ukiuq tamaat pijaangani ukiutigut aallatqiigutait. Nunallaani katimadjutikharnik ikajuutiginiaqtun naunaijaijaangat pijumalluaqtainik auladjutikhangillu. Ikajuutikharnik umiarnik tunijauhimajut talvannga Ukiuktaqtuniittunik Qaujihailiqijunik Tunngaviani pigiaqtittiniaqtun uvaptingnun tikiutijaangat tamarnun hinaani ungahiktunullu najugainun.Qanuriliurutingit:Ikajuqtiqarluta nunagijaujumi ikajuqtigiinit nunagijaujumilu, katitiriniaqtugut imarmik, nunamik, nunap qiqumaninganik, uumajuniglu naunaijagakhanik. Ihivriungniaqtavut qupilruit uvvalu mikijut imarmiujut nunaujat, uvvalu iqalukhiurniaqtugut nunamingni angujauhimajunin maliglugit DFO nalunaqtuliqinikkut uuktuutikkut laisikkut havauhiit. Ilittuqhaivingmi, hanaffaarniaqtugut qanurininginnik aadjikutaanik Ukiuqtaqtumi qunngiariangani qanuq halumailruit aallanngurninginnik qakugunnguraangat, aulaarninginik niqigijamingni, atauttimuuqpallianinginiglu. Ilaliutiniaqtavut qun'ngiaqtaujut maniqqami naunaijarvingmit naunaijariami pilaqutingit akhuurutaujumut nirijait huradjat naunaijariamilu aannirnaittumik, pitquhimut ihuaqtuq kiudjutimut qanuriliurutikhat.Qanuq, qanga, kimullu qanurinningit uqautauniaqqat Nunavunmi:Paqitaujut tuhaqtitauniaqtut havaktautilugit Iqaluktuuttiami aviktuqhimajumilu tigummidjutiqaqtut. Havaqatiginiaqtavut nunallaani Inuit ilaqatigiigijaingit,

ilaujullu Kitikmeot Inuit Katidjutiqatigiingit, Anguniaqtuliqijitkut, Hamilaatkullu hivuliqtingit, ilaqatigiiktukharnik naunaijaijaangat nalvaaqhimajainik. Iniriirumik ukiuq tamaat auladjutikharnik, naunairutikhangit ilaqatigiiktauniaqtun talvuuna nunallaani katimajukharnik, ajurnaittumik kangiqhinnaqtunik naittumik titiraqhimajunik, uqaqatigijaangatlu inirnikhat, inulrammiit, aallallu ilihimajainik pihimajut. Kingulliq qanurinningit, halumailrukkut nunaujat, ihivriurutit niqinun pidjutainun qajangnautit, pitquidjutillu ihuaqhainirmun havaktauniaqtut atauttimun ikajuutikhat nunamingni ihumaliurutinun. Tunihimaarniaqtugut nuutaanguqtiqhimajunik ajuiqhautikharnik katitirutikharnik nappaqtirutikharnik iniqtiqhimajunik tunijaangallu ilitturidjutikharnik ukiuqtaqtuniittunun avikturvingmiittunullu akhuuqhailiqijunik ikajuutikharnik avatiliqinikkut munaridjutikharnik atugakharnik havakhimaaqtunik.

Personnel

Personnel on site: 3

Days on site: 20

Total Person days: 60

Operations Phase: from 2025-09-20 to 2027-03-31

Activities

Location	Activity Type	Land Status	Site history	Site archaeological or paleontological value	Proximity to the nearest communities and any protected areas
Potential Sampling site for emerging contaminant 01	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 02	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant	Our project involves only non-invasive environmental	Cambridge Bay

contaminant 03			site history associated with the proposed sampling areas.	sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	
Potential Sampling site for emerging contaminant 04	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 05	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to	Cambridge Bay

				ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	
Potential Sampling site for emerging contaminant 06	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 07	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay

Potential Sampling site for emerging contaminant 08	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 09	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 10	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local	Cambridge Bay

				authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	
Potential Sampling site for emerging contaminant 11	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 12	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with	Cambridge Bay

				community permission and guidance.	
Potential Sampling site for emerging contaminant 13	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 14	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 15	Sampling sites	Marine	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting	Cambridge Bay

				any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	
Potential Sampling site for emerging contaminant 16	Sampling sites	Inuit Owned Surface Lands	This proposed sampling sites is located near the Old Town area of Cambridge Bay. We will consult with local authorities and communities prior to any field activities to obtain permission and ensure that sampling will not disturb any potential heritage features.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay
Potential Sampling site for emerging contaminant 17	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed sampling areas.	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any sampling locations, we will consult with local authorities and communities in Cambridge Bay to ensure that the work avoids any known archaeological, paleontological, or cultural heritage	Cambridge Bay

				sites. All sampling activities will be conducted only with community permission and guidance.	

Community Involvement & Regional Benefits

Community	Name	Organization	Date Contacted
Cambridge Bay	Mayor Wayne Gregory, Chief Administrative Officer Jim MacEachern, Community Economic Development Officer Angela Gerbrandt, Lands Clerk Colin Dickie	the Hamlet of Cambridge Bay	2025-08-15
Cambridge Bay	Fred Pedersen, Cory Barker	Kitikmeot Inuit Association	2025-08-15
Cambridge Bay	Emily Angulalik	Pitquhirnikkut Ilihautiniq	2025-08-25
Cambridge Bay	Ekaluktutiak Hunters and Trappers Organization	Ekaluktutiak Hunters and Trappers Organization	2025-08-25

Authorizations

Indicate the areas in which the project is located:

Kitikmeot

Authorizations

Regulatory Authority	Authorization Description	Current Status	Date Issued / Applied	Expiry Date
Nunavut Research Institute	Research licence required under the Nunavut Scientists Act for conducting environmental sampling and analysis in the Cambridge Bay region.	Applied, Decision Pending		
Fisheries and Oceans Canada	A fisheries sampling permit may be required for the collection of fish samples. The project team will first consult with local communities to confirm the need and obtain consent before submitting the permit application.	Not Yet Applied		

Project transportation types

Transportation Type	Proposed Use	Length of Use
Air	The research team will travel by commercial flight to Cambridge Bay to access the study area.	
Water	Marine sampling will be conducted using research vessels operated by the Arctic Research Foundation or locally chartered boats, depending on the season and site location.	
Land	Land-based sampling sites will be accessed by vehicle within Cambridge Bay and surrounding areas.	

Project accomodation types

Community

Other,

Material Use

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

Equipment Type	Quantity	Size - Dimensions	Proposed Use
Water sampler	1	5 L capacity, 60 cm length × 10 cm diameter	1 water sample will be used to take water samples from the potential sampling sites for contamination analysis.
soil auger	1	1.2 m length × 80 cm diameter	Used to manually drill into frozen ground (permafrost or active layer soils) to obtain soil cores for environmental and contaminant analysis. Suitable for shallow permafrost sampling (typically up to 1–2 m depth).
soil sampler	1	60 cm length × 10 cm diameter	A soil sampler will used to take soil samples from the sampling sites. The residue soil will be filled back to the hole and with appropriate mark.
resaerch vessel	1	30m length	A research vessel provided by Arctic Research Foundation will be used for sampling for marine sampling sites.
a small resaerch vessel	1	5m length	A small research vessel provided by the Arctic Research Foundation will be used for sampling at shallow bay sites.
containers	5	50cm length× 30 cm width × 30cm height	The containers will be used to contain water/soil samples. (Fish samples, only obtained from the local harvest and with permission)

Detail Fuel and Hazardous Material Use

Detail fuel material use:	Fuel Type	Number of containers	Container Capacity	Total Amount	Units	Proposed Use
Diesel	fuel	0	0	0	Liters	Diesel is used for research vessel provided by Arctic research foundation. No additional container is needed.

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
Sampling sites	Hazardous	0-50 mL	If a motorized soil auger is used, minor risk of fuel/oil leakage may exist. To mitigate this, absorbent pads and spill kits will be prepared on site to contain and clean any potential leaks.	The related waste will also transported to MUN for professional waste deposite at MUN.
Sampling sites	Overburden (organic soil, waste material, tailings)	approximately up to 2 garbage bags of solid waste	All sampling-related materials, including disposable gloves, labels, and other consumables, will be collected after use and removed from the field site. No such items will be left on the land or water; all waste will be returned for proper disposal.	All waste will be collected after use and either disposed of at the designated municipal landfill in Cambridge Bay, in accordance with local Hamlet guidelines, or transported back to Memorial University for proper disposal, depending on the type of material.

Environmental Impacts:

The proposed project is expected to have minimal environmental impact. All fieldwork consists of small-scale, non-invasive sampling of water, sediment, permafrost, and, with community consent, fish tissues. Sampling will not introduce pollutants, modify habitats, or require construction or infrastructure. Potential short-term impacts include localized physical disturbance during sample collection, minor disruption in sensitive shoreline or lagoon areas, and possible temporary presence of researchers in areas used by wildlife. These effects are small in scale, temporary, and fully mitigable. Mitigation measures include strict “leave-no-trace” protocols, equipment decontamination to prevent cross-site contamination, removal of all materials and waste, careful site selection, and coordination of fieldwork timing to avoid sensitive habitats and subsistence activities. All activities will be planned and conducted in consultation with local authorities to prevent disturbance to culturally or ecologically significant areas. Overall, the project will not create new environmental pressures and is expected to have a net positive impact by improving understanding of contaminant pathways and providing data to support long-term ecosystem protection and evidence-based management decisions.

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

The proposed study area is located within and around Cambridge Bay, Nunavut, a coastal Arctic region characterized by continuous permafrost, low-lying tundra, shallow freshwater systems, and nearshore marine environments. The physical landscape consists of glacially derived sediments and sedimentary bedrock, with numerous lakes, wetlands, and drainage channels that influence surface water flow and contaminant transport pathways. Seasonal thaw and thermokarst processes are present in localized areas, which may affect the mobility of pollutants through soil and groundwater systems.Several proposed sampling sites are strategically located near key points of potential contaminant input, including the municipal drinking water source, wastewater lagoon, waste disposal site, and areas suspected of historical pollution or contaminants (e.g., microplastics and PFAS) release. These are complemented by reference sites in relatively undisturbed environments to establish baseline conditions. The marine environment is shaped by tidal processes, sea ice dynamics, and nearshore currents, all of which are relevant for understanding the transport and fate of emerging contaminants.The project area is not within or immediately adjacent to designated protected areas, cultural heritage sites, or known sensitive habitats. No new roads, trails, or marine routes will be constructed, and all access will use existing infrastructure. The physical environment provides an important process for assessing how emerging contaminants move through Arctic hydrological, sedimentary, and cryospheric systems under changing environmental conditions.

Description of Existing Environment: Biological Environment

The terrestrial environment in the Cambridge Bay region supports Arctic tundra vegetation, including mosses, lichens, sedges, and dwarf shrubs, which provide essential habitat for wildlife such as Arctic fox, muskox, and migratory birds. Freshwater and nearshore marine ecosystems support diverse planktonic and benthic communities, which form the base of the food web and sustain culturally and nutritionally important fish species such as Arctic char.These biological systems are also key pathways for the entry and movement of emerging contaminants. Microplastics, PFAS, PBDEs, and oil-derived pollutants can be taken up by plankton and benthic organisms, subsequently bioaccumulating and biomagnifying through trophic levels into fish, birds, and marine mammals. Because these species are integral to local diets and cultural practices, the presence of such contaminants poses potential risks to both wildlife health and human consumers, including endocrine disruption, immune impacts, and other chronic health effects.Currently, the distribution, concentration, and biological uptake of these contaminants remain poorly characterized in the region. By collecting water, sediment, and—with community consent—fish samples (will be obtained from the local harvest, if allowed, we will not collect sample directly), this project will establish a baseline understanding of contaminant pathways in Arctic food webs. These data are essential for assessing risks to ecosystem integrity, traditional food safety, and community health.

Description of Existing Environment: Socio-economic Environment

The study area is closely linked to the Cambridge Bay community, with several sampling sites located near areas of active use such as the municipal drinking water source, waste disposal site, and the local port. Emerging contaminants in these areas may originate from global long-range transport as well as local sources, including proximity between dumping sites and water supply points. Because these areas are directly connected to community infrastructure and traditional resource use, understanding contaminant distribution and pathways is essential. The results of this project will provide evidence-based information to support local decision-making on water safety, waste management, and long-term environmental planning.

Miscellaneous Project Information

This project involves small-scale, non-invasive field sampling focused on identifying and characterizing emerging contaminants such as microplastics, PFAS, PBDEs, and oil-derived pollutants in water, sediment, permafrost, and fish tissues (if permitted). All activities have been carefully designed to avoid environmental disturbance, infrastructure development, or long-term alteration of the site.Comprehensive mitigation and management measures — including emergency response planning, spill prevention, waste handling, and data governance protocols — have already been outlined in Part 2 of this application. These plans cover staff safety procedures, fuel and material transport, incident reporting, and coordination with local authorities in the event of unexpected situations. Sampling follows strict “leave-no-trace” and decontamination protocols, and all waste or materials will be removed from the field and disposed of appropriately.Because the project does not involve construction, hazardous chemical use, site modification, or infrastructure decommissioning, plans such as abandonment or remediation are not applicable. Wildlife disturbance is not anticipated, and sampling locations will be reviewed with community partners to ensure no interference with culturally significant sites or species at risk. Supporting documents (e.g., emergency response and waste management plans) can be provided upon request.

Identification of Impacts and Proposed Mitigation Measures

Potential Harm / Disruption•Community anxiety or social disruption: Learning about contaminant presence (especially in traditional food sources or water) could cause concern or changes in behavior if not contextualized.•Perceived misalignment or mistrust: If engagement, data use, or benefit-sharing aren’t clear, community members might feel the project is externally driven rather than collaborative.•Interference with subsistence or cultural activities: Fieldwork could overlap with hunting, fishing, gathering, or culturally significant timing unless coordinated.•Burden of participation: Time, travel, or expectations placed on local trainees, guides, and knowledge holders might strain personal or family obligations.•Privacy and knowledge misuse concerns: Sharing traditional ecological knowledge or participating in discussions could raise worries about how that information is stored, interpreted, or disseminated.•Environmental disturbance: Even non-biological sampling (water, sediment, permafrost) can cause minor habitat disruption, especially in sensitive shoreline or lagoon zones.•Logistical risks in the field: Weather exposure, travel hazards, and wildlife encounters during field campaigns present safety considerations.Mitigation Measures•Community co-design and local leadership: All planning (timing, sites, interpretation) is done in collaboration with Cambridge Bay partners, with local people leading or guiding field efforts to ensure cultural and ecological appropriateness and to minimize disruption.• Animal sampling: Only culturally significant fish provided by local harvesters (if permitted) will be included; no sampling of other animals.•Scheduling with respect to subsistence/culture: Field campaigns are negotiated to avoid conflict with local hunting/fishing seasons or cultural events.•Transparent communication and consent: Participants receive clear explanations of purpose, use of information, and their rights; culturally adapted informed consent and opt-out mechanisms are in place.•Capacity-aligned participation: Training and employment opportunities are structured to offset burdens, with explicit agreements outlining roles, compensation, and support, reducing unintended strain.•Minimal-impact protocols: Sampling follows “leave-no-trace” principles; equipment is cleaned to avoid cross-site contamination; waste is removed; fuel and materials are managed with spill prevention and response plans.•Data governance: Shared stewardship arrangements protect traditional knowledge and personal data, with community review before broader use.•Safety and adaptive management: We will collaborate with local safety officers—already trained in weather, travel, and wildlife safety—to deliver advanced, scenario-based training and jointly document incidents and feedback for real-time procedure adjustments.

Cumulative Effects

The proposed project is small in scale, temporary, and non-invasive. It does not introduce pollutants, alter habitats, or create infrastructure, and therefore will not contribute directly to long-term cumulative

environmental pressures. While some short-term negative effects — such as minor site disturbance, community concern, or participant burden — may occur, these are localized, fully mitigable, and do not interact with other regional activities in a way that would produce cumulative impacts.Importantly, the project's primary purpose is to investigate and characterize existing contaminant pathways and their potential impacts on human health and ecosystems. In this sense, its cumulative contribution is positive: the research will generate baseline data, improve understanding of how pollutants from both global and local sources accumulate over time, and provide early-warning information to support evidence-based management. These outcomes can help reduce long-term cumulative risks to water quality, food safety, and community well-being.

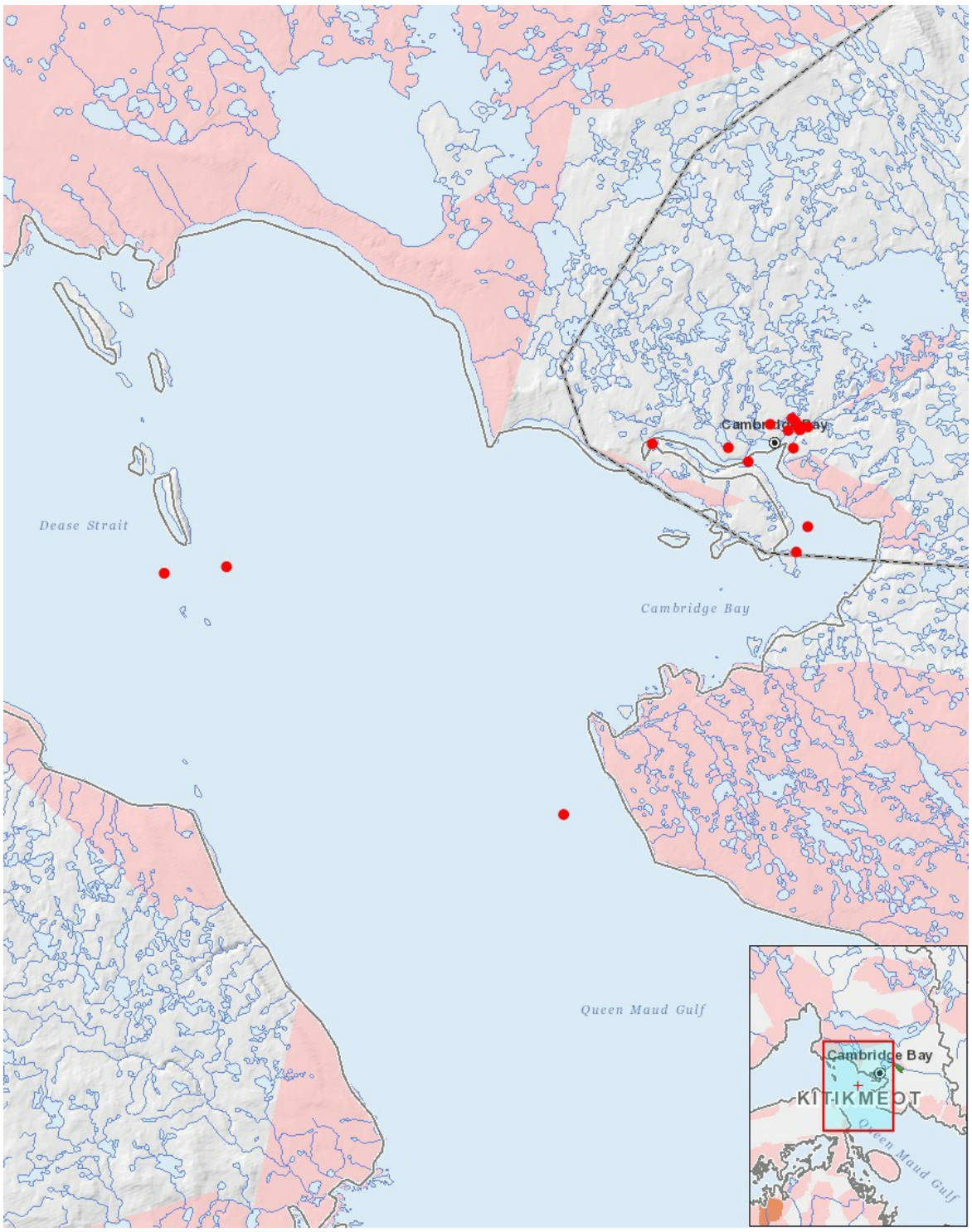
Impacts

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	M	M	-	P	P	-	-	P	-	-	M		M	-	-	P	P		M	P	P	P	P
Decommissioning																									
-		-	-	-	-	-	-	-	-	-	-	-	-		-	-	-	-	-		-	-	-	-	-

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

Project Location



List of Project Geometries

1	point	Potential Sampling site for emerging contaminant 01
2	point	Potential Sampling site for emerging contaminant 02
3	point	Potential Sampling site for emerging contaminant 03
4	point	Potential Sampling site for emerging contaminant 04
5	point	Potential Sampling site for emerging contaminant 05
6	point	Potential Sampling site for emerging contaminant 06
7	point	Potential Sampling site for emerging contaminant 07
8	point	Potential Sampling site for emerging contaminant 08
9	point	Potential Sampling site for emerging contaminant 09
10	point	Potential Sampling site for emerging contaminant 10

11	point	Potential Sampling site for emerging contaminant 11
12	point	Potential Sampling site for emerging contaminant 12
13	point	Potential Sampling site for emerging contaminant 13
14	point	Potential Sampling site for emerging contaminant 14
15	point	Potential Sampling site for emerging contaminant 15
16	point	Potential Sampling site for emerging contaminant 16
17	point	Potential Sampling site for emerging contaminant 17