



## **Demande de la CNER faisant l'objet d'un examen préalable #126243**

### **ArcSolution: Emerging Pollutants and Health in the Arctic**

**Type de demande :** New

**Type de projet:** Scientific Research

**Date de la demande :** Wednesday, October 15, 2025

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

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# DÉTAILS

## Description non technique de la proposition de projet

Anglais: Project Title: ArcSolution: Arctic Pollution in a One Health Perspective—from Complex Challenges to Sustainable Solutions Short Title: ArcSolution: Emerging Pollutants and Health in the Arctic PI: Bing Chen, Memorial University of Newfoundland Background, 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 Matters Cambridge 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.

Français: N/A

Inuktitut: N/A

Inuinnaqtun: Havaakhaq Atia: ArcSolution: Ukiuqtaqtumi Halumailrua iluani Atauhiq Aanniaqtailinikkut Ihumagijaujuq-uvanngat Ajurnaqtuq Ajuqhautit Atuqhimakhaaqtakhainit Akuniraalungmik Ihuaqhaidjutikhat PI: Bing Chen Memorial Iliharvigjuangat NewfoundlandmiKangiqhidjutit, Qaujihainirnut Apiqhuutit unalu Hulidjutikhat: Hamna Ukiuqtaqtuq uunnakpallialiqtuq malruiqtarnigut hilarjuami aktilaangit, taimaa nuna iluani qiqumaningit auktuqpallialiqtuq hikut aallanguqpallialivlutik, hila ajurnaqpalliaqhunilu atauttikkuq halumailqipalliaqlunilu agjaqtuqtunut, aallanguqniq pihimmaarnirlu. Hapkuat aallanguqtingit, ilagivlugillu tamarmik atukhaarnirnut ihumagijaujut uvvalu qanilruani ikajuutit imaatut uqhurjuat munarijarningit, umiaqtuqtunut hulidjuhiit, unalu kuvvirarvingillu tutquumavingit, taimaa hivuuranaqpalliaqlunilu halumailruanit Iqaluktuuttiami. Hapkuat halumailruangit ihumaaluutaulluaqtut: •Mikitqijaujut palaastiit: mikijunnuit palaastiit ilakuit hivitunia nungulaikhimakhaaqtut ingutaalaaqhutik niqinut nirijuktainut. •PFAS: Aallanguqtaqtut piliuqhijaujut 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 unghahiktunut, nungutpalliaatqurtulu kajumiittunnuamik alappaarnaqtumi, katitirlutiglu pitquhikkut niqitigut niridjutainun. Havakhugit kinguani havaktauhimajut hapkunangga Ukiuqtaqtumi Halumailrut Pinahuagutit taapkua illituriq PBDEt hanianit aviktuqhimajumi, una havaakhaq (havaqatigivlugillu ukunangit Ukiuqtaqtumi Qaujiharuiq Tunngavia) naunaiqhilaqtut hup halumailruat ittut haniani Iqaluktuuttiaq, qanuq hilaqutit unalu hilaup hilaqutigijait, qanuq katitihimajut uumajunit ihumagijaujut niqinut pitquhinullu. Tikinnahuarutijut ihivriurlugit qanurinningit, aulaniit, hulaqutainun niqailiunirmun, piliurlutiglu ihuaqtunik ihuaqhaidjutikhanik havaqatigilugit nunamingni havaqatigiit. Ihumaliurutinga Atauhiq Aaninaqtailiniq piyuq ihivriuriami atajut avatinganit, huradjaq, inungnullu aanniaqtailininga. Anginiqarnia uumani qaujiharutimi Iqaluktuuttiap hinaa avataita ihumaaluutaulluarijaat hila uunnakpallialirmat angiglivallaarmat tamarmik ingutaqtunut unalu angijaaqtumik halumailrunigut. Mahaktiliraangat nunap puvitquumaninga imaalu aallanguqningit imaqarviit hiamittiqittivaktut utuqqanik hivuaqut tutquqtauhimajunik halumailrunik, kuvvirarviit imaalu haniani hinaani katitirivaktut imaalu qakugu hiamittiqittivaktut halumailrunik. Halumailrut taapkua aulanngittut avatipingni hivitujumik uvvalu itirlutik niqinun niridjutainun atuqtaujut Nunaqaqqaqtut nunallaat. Piqanganmat naunaijaqhijamajunik kangiqhimadjutinik inmi ukiup ilaani idjuhiit, qanuq katitihimajut uumajuni, uvvalu inmi hulaqutainun nunamingni nirijainun pidjutaujuq angijumik ajuqhautinik illiturihimanikkut qajangnautinik uvvalu piraarnirmik kiudjutinik. Una havauhikhaq pipkaidjutijuuq European Union-mit ittuq uumani nunarjuaptingni aadjikutariiktumik tunngavinga, ikajuqtaupluni Kaanataup Nutaangujuq Kiglingit Qaujiharirnut Manngit (NFRF), pipkaidjutijuuq naunaijaqtaamingnik Iqaluktuuttiamit naunaijariami tahapkununga aallanit Ukiuqtaqtumi aviktuqhimajunit. Pijaangat anginirmik tautuktuujarutikharnik ihuarjuumiqtittinniaqtun akhuurnaqtunik ikaarnikharniglu, pijaangat ihuaqhaidjutikharnik aturiaqaqtunik hanaqidjutikharnik nalaumajut nunallaani pidjutikharnik taimaa aittuihimaqtillunik nunarjuaptingnik pidjutikharnik aulattittijaangat ajurnairutikharnik atugakharnik ukiuqtaqtuniittunik nunallaangit aulajut nuutaanik halumairungnik ajurnautiaqaqtunik talvuuna qilaminnaaq aallanguqtiliqutunik hila. Humi, Qanga, unalu Qanuq Hivitunikhaat Manirarmi Qaujiharuiqhaat Pinahuaqqa: Maniqqami havaaq hivunigijakhaat Iqaluktuuttiaq, kuvvirvianit, unalu haniani hinaani, humiliqaak humi tikiqkainiq uvvalu katitirningit halumailrut hulaqutauniaqtut nunallaat ikajuutainun. Ihuaqhaivaktugut pingahunik hitamanigluuniin naunaijainikkut aulaarutinik ukiuq tamaat pijaangani ukiutigut aallatqiigutait. Nunallaani katimadjutikharnik ikajuutiginiaqtun naunaijaijaangat pijumalluaqtainik auladjutikhangillu. Ikajuutikharnik umiarnik tunijauhijaujut talvannga Ukiuqtaqtuniittunik Qaujiharuiqijunik Tunngaviani pigiaqtittiniaqtun uvaptingnun tikiutijaangat tamarnun hinaani unghahiktunullu najugainun. Qanuriliurutingit: Ikajuqtiharluta nunagijaujumi ikajuqtigiinit nunagijaujumilu, katitiriniaqtugut imarmik, nunamik, nunap qiqumaninganik, uumajuniglu naunaijagakhanik. Ihivriungniaqtavut qupilruit uvvalu mikijut imarmiujut nunaujat, uvvalu iqalukhiurniaqtugut nunamingni angujauhijamajunin maliglugit DFO nalunaqtuliqinikkut uuktuutikkut laisikkut havauhiit. Ilittuqhaivingmi, hanaffaarniaqtugut qanurininginnik aadjikutaanik Ukiuqtaqtumi qunngiarianganani qanuq halumailruit aallanguqninginnik qakugunnguraangat, aulaarninginik niqigijamingni, atauttimuqpallianingiginiglu. Ilaliutiniaqtavut qun'ngiaqtavut maniqqami naunaijarvingmit naunaijariami pilaqutingit akhuurutaumut nirijait huradjaq naunaijariamilu aannirnaittumik, pitquhimut ihuaqtuq kiudjutimut qanuriliurutikhat. Qanuq, qanga, kimullu qanurinningit uqutauniaqat Nunavunmi: Paqitaujut tuhaqtitauniaqtut havaktautilugit Iqaluktuuttiami aviktuqhimajumilu tigummidjutiaqtut. Havaqatiginiaqtavut nunallaani Inuit ilaqatigijigjainigut,

ilaujullu Kitikmeot Inuit Katidjutiqaṭigiingit, Anguniaqtuliqijitkut, Hamilaatkullu hivuliqtingit, ilaqaṭigiiktukharnik naunaijaangat nalvaaqhimajainik. Iniriikumik ukiuq tamaat auladjutikharnik, naunairutikhangit ilaqaṭigiiktauniaqtun talvuuna nunallaani katimajukharnik, ajurnaittumik kangiqhinnaqtunik naittumik titiraqhimajunik, uqaqaṭigijaangatlu 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 illitridjutikharnik 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

## Activités

Emplacement	Type d'activité	Statut des terres	Historique du site	Site à valeur archéologique ou paléontologique	Proximité des collectivités les plus proches et de toute zone protégée
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 contaminant 03	Sampling sites	Inuit Owned Surface Lands	There is no known historical use or significant site history associated with the proposed	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants. Prior to selecting any	Cambridge Bay

			sampling areas.	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 ensure that the work avoids any known archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and	Cambridge Bay

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.	guidance. 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	Cambridge Bay

				archaeological, paleontological, or cultural heritage sites. All sampling activities will be conducted only with community permission and guidance.	
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 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 11	Sampling sites	Marine	There is no known historical use or significant site history associated with	Our project involves only non-invasive environmental sampling at potential sites to investigate emerging pollutants.	Cambridge Bay

			the proposed sampling areas.	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 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 community permission and guidance.	Cambridge Bay
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	Cambridge Bay

				permission and guidance.	
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 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 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	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	Cambridge Bay

			ensure that sampling will not disturb any potential heritage features.	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 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 sites. All sampling activities will be conducted only with community permission and guidance.	Cambridge Bay

### Engagement de la collectivité et avantages pour la région

Collectivité	Nom	Organisme	Date de la prise de contact
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

# Autorisations

Indiquez les zones dans lesquelles le projet est situé:

Kitikmeot

## Autorisations

Organisme de régulation	Description des autorisations	État actuel	Date de l'émission/de la demande	Date d'échéance
Institut de recherche du Nunavut	Research licence required under the Nunavut Scientists Act for conducting environmental sampling and analysis in the Cambridge Bay region.	Applied, Decision Pending		
Pêches et Océans 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	Utilisation proposée	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

Collectivité

Autre,

## Utilisation de matériel

Équipement à utiliser (y compris les perceuses, les pompes, les aéronefs, les véhicules, etc.)

Type d'équipement	Quantité	Taille – Dimensions	Utilisation proposée
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 be used to take soil samples from the sampling sites. The residue soil will be filled back to the hole and with appropriate mark.
research vessel	1	30m length	A research vessel provided by Arctic Research Foundation will be used for sampling for marine sampling sites.
a small research 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)

### Décrivez l'utilisation du carburant et des marchandises dangereuses

Décrivez l'utilisation de carburant :	Type de carburant	Nombre de conteneurs	Capacité du conteneur	Quantité totale	Unités	Utilisation proposée
Diesel	fuel	0	0	0	Liters	Diesel is used for research vessel provided by Arctic research foundation. No additional container is needed.

**Consommation d'eau**

<b>Quantité quotidienne (m3)</b>	<b>Méthodes de récupération de l'eau proposées</b>	<b>Emplacement de récupération de l'eau proposé</b>
0		

# Déchets

## Gestion des déchets

Activités du projet	Type des déchets	Quantité prévue	Méthode d'élimination	Procédures de traitement supplémentaires
Sampling sites	Dangereux	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 be transported to MUN for professional waste deposit at MUN.
Sampling sites	Mort-terrain (sol organique, déchets, résidus)	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.

### Répercussions environnementales :

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 de l'environnement existant : Environnement physique**

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 de l'environnement existant : Environnement biologique**

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 de l'environnement existant : Environnement socio-économique**

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 des répercussions et mesures d'atténuation proposées**

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.

### **Répercussions cumulatives**

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.

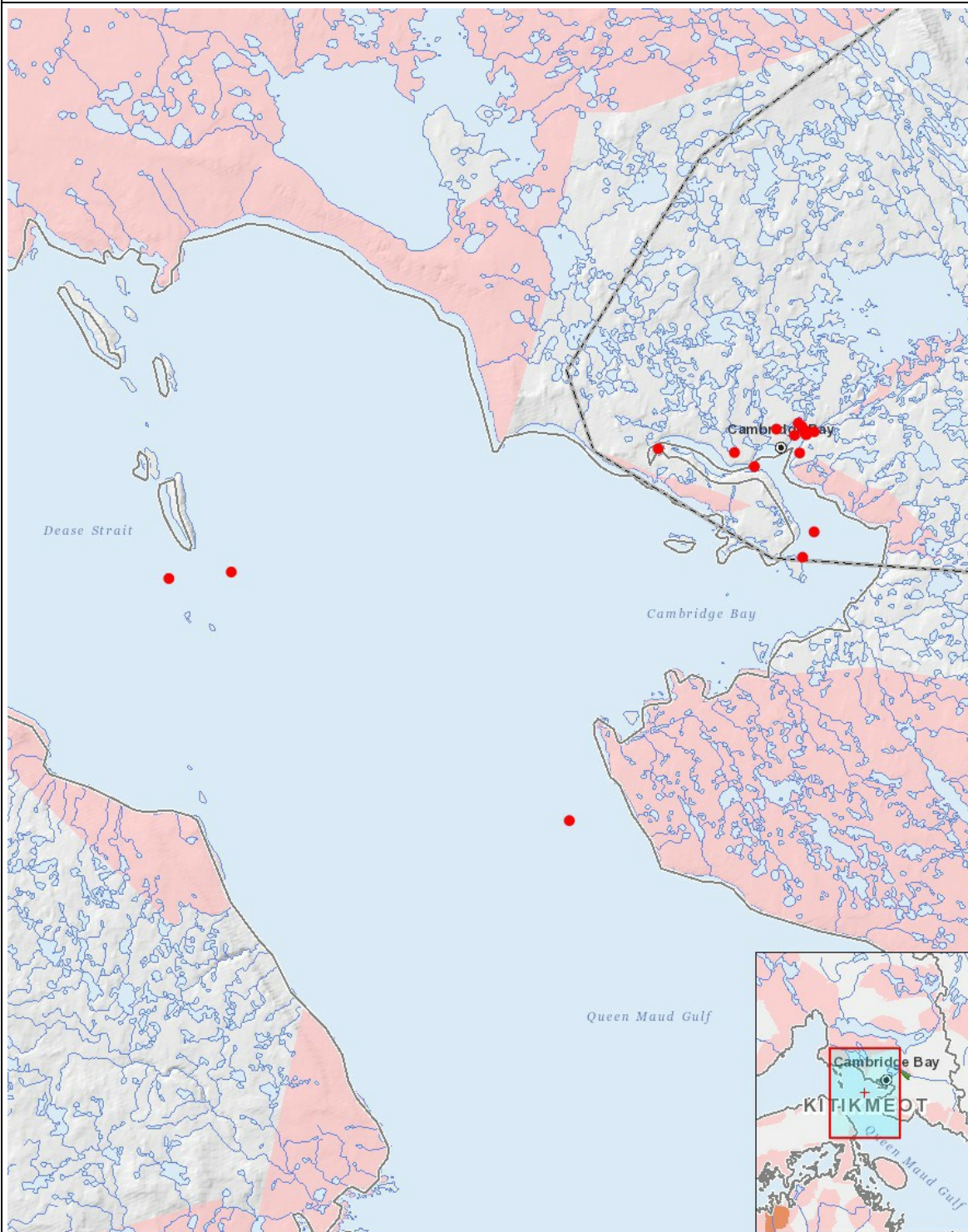
# Impacts

## Identification des répercussions environnementales

	PHYSICAL		Socio-Economic		Biological		Other		Human Health													
	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	Vegetation	Wildlife, including habitat and migration patterns	Birds, including habitat and migration patterns	Aquatic species, incl. habitat and migration/spawning	Wildlife protected areas	Archaeological and cultural historic sites	Employment	Community wellness	Community infrastructure	Human health
<b>Construction</b>																						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
<b>Exploitation</b>																						
Sampling sites	P	M	M	-	P	P	-	-	P	-	-	M	M	-	-	P	P	M	P	P	P	P
<b>Désaffectation</b>																						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

(P = Positive, N = Négative et non gérable, M = Négative et gérable, U = Inconnue)

## Site du projet



## Liste des géométries de projet

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 |