



NEPTUNE Canada
Transforming Ocean Sciences

June 14, 2012

Mosha Cote
P.O. Box 1720
Iqaluit NU X0A 0H0
transmitted via email

Dear Mosha:

Please find attached our Scientific Research License Application for a proposed ocean observatory in Cambridge Bay. We are very excited about supporting and installing the first observatory in Canada's Arctic for year-round monitoring of the marine environment. Our goal is to make the observatory data available, on a real-time basis, to the community of Cambridge Bay. Since this is the first of its kind, we would work with the local users (schools and municipal leaders) to change and improve so that it can best serve the community.

We hope to start installation of the observatory in the second week of August, 2012. We realize we are requesting a short turn around on the research license process, but circumstances prevented us from submitting earlier.

If possible, could you let me know if we are missing any information in our application? Also, please let me know if we can assist, in any way, with the application process, e.g. we would be happy to help making contact with the organizations or individuals who provide comments.

In the meantime, we will continue to work with the community to move the project forward.

Sincerely,

Kate Moran
Director

SCIENTIFIC RESEARCH LICENCE APPLICATION LAND, FRESHWATER & MARINE BASED RESEARCH

NRI strongly recommends that applicants review the following documents prior to submitting an application: *Scientific Research Licencing Guidelines* and *Negotiating Research Relationships in Inuit Communities: A Guide for Researchers*.

For more information about the Nunavut Research Institute (NRI) please visit our web site www.nri.nu.ca

IMPORTANT

This application fulfills the requirements for the NIRB environmental screening. Please be advised that your application will not be processed until the application form, project summary, and maps are received.

SECTION 1: APPLICANT INFORMATION

1a. Project Title Cambridge Bay Undersea Observatory

1b. Project Number

Please indicate if applicant has submitted any previous application(s) to NRI related to this project proposal? Yes No X

If yes, please indicate the previous NRI licence number: _____

Please indicate if applicant has submitted any previous application(s) to NIRB related to this project proposal? Yes No X

If yes, please indicate the previous NIRB project number(s): _____

2. Applicant's full name and mailing address:

<u>Dr. Kate Moran, Director, NEPTUNE Canada</u>	Phone: <u>250-472-5350</u>
<u>University of Victoria, PO Box 1700</u>	Fax: <u>250-472-5370</u>
<u>Victoria, BC V8W 2Y2 CANADA</u>	Email: <u>kmoran@uvic.ca</u>

3. Field Supervisor's name and mailing address:

<u>Ryan Flagg, c/o NEPTUNE Canada</u>	Phone: <u>250-857-4344</u>
<u>University of Victoria, PO Box 1700</u>	Fax: <u>250-472-5370</u>
<u>Victoria, BC V8W 2Y2 CANADA</u>	Email: <u>rmflagg@uvic.ca</u>

4. Other Personnel list (name, position, affiliation)

<u>Dr. Kim Juniper, Associate Director, Science NEPTUNE Canada</u>	<u>Scott McLean, Director, Ocean Networks Canada Centre for Enterprise and Engagement</u>
<u>Benoît Pirenne, Associate Director, IT, NEPTUNE Canada</u>	<u>Meghan Tomlin, Documentation Technician, NEPTUNE Canada</u>
<u>Ian Kulin, Associate Director, Engineering, NEPTUNE Canada</u>	<u>Christina Waddle, Administrative Assistant, NEPTUNE Canada</u>

SECTION 2: AUTHORIZATION NEEDED

1. Indicate all authorizations associated with the project proposal:

<input type="checkbox"/> Regional Inuit Association (RIA) <input type="checkbox"/> Nunavut Water Board (NWB) <input type="checkbox"/> Nunavut Planning Commission (NPC) <input type="checkbox"/> Department of Indian And Northern Development (DIAND) <input type="checkbox"/> Department of Fisheries and Oceans (DFO) <input type="checkbox"/> Community Government & Services (CG&S) <input type="checkbox"/> Nunavut Research Institute (NRI/GN) <input type="checkbox"/> Department of Culture, Language, Elders, and Youth (CLEY/GN) <input type="checkbox"/> Canadian Launch Safety (CLS)	<input type="checkbox"/> Environment Canada (EC) <input type="checkbox"/> Department of Environment (GN) <input type="checkbox"/> Department of National Defense (DND) <input checked="" type="checkbox"/> Hamlet <input type="checkbox"/> Parks Canada (PC) <input type="checkbox"/> Canadian Wildlife Service (CWS) <input checked="" type="checkbox"/> Other (please specify): Department of Economic Development and Transportation _____
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2. List the active permits, licences, or other rights related to the project proposal and their expiry date:

None. We will require an inspection of our electrical box once installed and require a permit from the Hamlet of Cambridge Bay. Also, we are seeking permission from the Department of Economic Development and Transportation for use of the dock. We have not found any other required authorizations.

3. Have you applied for all authorizations required to conduct the project proposal activities?

YES

NO

NOTE: The electrical permit from the Hamlet of Cambridge Bay will be applied for once our box is installed; the hamlet has been made aware of our plans. Also, we are currently investigating what authorization is required from the Nunavut Department of Economic Development and Transportation for use of the dock.

SECTION 3: PROJECT PROPOSAL DESCRIPTION

1. Indicate the activities related to the project proposal:

<input type="checkbox"/> Temporary camp (to be removed at end of field season) <input type="checkbox"/> Permanent camp (to remain for life of authorization) <input type="checkbox"/> Construction of recreational or safety cabin <input type="checkbox"/> Temporary fuel storage (to be removed at end of field season) <input type="checkbox"/> Permanent fuel storage (to remain for life of authorization) <input checked="" type="checkbox"/> Placement of structures for life of permit (other than camp or cabin – i.e. scientific instruments) <input type="checkbox"/> Placement of permanent structures (other than camp or cabin – i.e. scientific instruments) <input type="checkbox"/> Air surveys (i.e. geophysical, wildlife) <input checked="" type="checkbox"/> Use of aircraft/watercraft/land vehicle for personnel drop-off and pick-up to project location <input checked="" type="checkbox"/> Use of on-site mechanized vehicles (i.e. atv, snowmobile, truck, zodiac) <input type="checkbox"/> Sewage or grey water disposal via sump <input type="checkbox"/> Hazardous waste storage or disposal	<input type="checkbox"/> Solid waste disposal <input type="checkbox"/> Chemical storage <input type="checkbox"/> Explosives storage <input type="checkbox"/> Soil testing <input type="checkbox"/> Soil disposal/ soil storage <input type="checkbox"/> Incineration of combustible wastes and removal of non-combustible wastes <input type="checkbox"/> River/ stream/ lake crossing or work/ bridge <input type="checkbox"/> Drainage alteration <input type="checkbox"/> Geoscientific sampling by diamond drilling <input type="checkbox"/> Geoscientific sampling by soil sampling <input type="checkbox"/> Geoscientific sampling by trenching <input type="checkbox"/> Geoscientific sampling by borehole core <input type="checkbox"/> Blasting <input type="checkbox"/> Channeling <input type="checkbox"/> Excavation <input type="checkbox"/> Hydrological testing <input type="checkbox"/> Abandonment and restoration
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<input type="checkbox"/>	Site restoration (fertilization/ grubbing/ scarification/ spraying/ recontouring)
<input checked="" type="checkbox"/>	Research
<input type="checkbox"/>	Ecological survey

<input type="checkbox"/>	Harvesting
<input type="checkbox"/>	Removal of vegetation for scientific purposes
<input type="checkbox"/>	Other:

2. Personnel

Total No. of personnel on site = (A) 3 Total No. of days on-site = (B) 15 Total No. of Person days (A) × (B) = 45

3. Timing

Period of operation: 7 August 2012 to August 2017
 Proposed term of authorization: 7 August 2012 to 31 August 2017

Please outline the phases of the proposed project (construction/ operation/ decommissioning) including the timing and scheduling of each phase.

We plan for installation of undersea instruments, cable and shore station in August 2012. We also plan to install a computer station in the high school or at the heritage society for live viewing of the data. Operation, including maintenance of undersea and shore based infrastructure, until 2017.

4. Location(s) of data collection:

Location Name	Region North Baffin, South Baffin, Kivalliq, Kitikmeot	Co-ordinates Lat (degree / minute), Long (degree / minute)	NTS Map Sheet #	Land Status Crown, Commissioners', Inuit Owned
Cambridge Bay	Kitikmeot	69°6'N, 105°3'W	77D	Crown?

If the project proposal includes a **camp**, please provide the coordinates of the camp location

Lat (degree/minute) _____ Long (degree/minute) _____
 NTS Map Sheet # (if different from above) _____

The Nunavut Impact Review Board may require additional location information in a subsequent Project Specific Information Requirement (PSIR) submission. This may take the form of a digital Geographic Information Systems (GIS) file.

SECTION 4: NON-TECHNICAL PROJECT PROPOSAL DESCRIPTION

Please attach a non-technical description of the project proposal, no more than 500 words, in English and Inuktitut (+Inuinnaqtun, if in the Kitikmeot). The project description should outline the following:

- See attached.

SECTION 5: MATERIAL USE

1. List equipment (including drills, pumps, aircrafts, vehicles etc.):

Equipment type and number	Size – dimensions	Proposed use
Underwater instrument platform	Tripod shape - 1.25m high with a 1.5m wide	Supports underwater camera, hydrophone and instruments that

	base	will monitor salinity, temperature, pressure and fluorescence. Will sit on seafloor at approx. 15 m depth.
Seafloor ice profiler – installed on seafloor	Attached to tripod above	Acoustic measurement of ice thickness and plankton abundance in water column
Shore station	30" x 30" x 12"	Electrical box on the dock
Weather station	On antenna above shore station box – approx. 1m	Standard meteorological station
Underwater cable bundle and weighed rope (from dock to platform)	Approximately 70m long (both cable and a rope)	Provides power and communications to underwater instruments from shore station on wharf. Rope for recovery of platform.

2. Detail fuel and hazardous material use:

Fuel	Number of Containers and Capacity of Containers	Total Amount of Fuel (in Litres)	Proposed Storage Methods
Diesel	0		
Gasoline		We will be hiring a boat, which will use some fuel – unknown quantity.	
Aviation fuel	0		
Propane	0		
Other	0		
Hazardous Materials and Chemicals	0	Total Amount of Hazardous Materials and Chemicals (in Litres)	
Some silicone to fill conduit to prevent water entry.		Limited quantity, no chance of any release.	

3. Detail daily water consumption rates

Daily amount (in Litres)	Proposed water retrieval methods	Proposed water retrieval location
We will use some water for washing materials.	Hamlet water supply	Hamlet water supply

4. Have you applied for a Class A License with the Nunavut Water Board?

YES

NO

SECTION 6: WASTE DISPOSAL AND TREATMENT METHODS

1. List the types of waste:

Type of waste	Projected amount generated	Method of Disposal	Additional treatment procedures
Sewage (human waste)	None		
Greywater	None		
Combustible wastes	None		
Non-Combustible wastes	Small volume (40 litres) of construction and cable splicing waste during installation	Will return waste by air to University of Victoria	

Overburden (organic soil, waste material, tailings)	None		
Hazardous waste	None		
Other:			

2. Will you be incinerating combustible waste, removing all solid waste, and removing the ash generated from incineration?

YES

NO

SECTION 7: COMMUNITY INVOLVEMENT & REGIONAL BENEFITS

1. List the community representatives that have been contacted and provide the minutes of the meetings if available:

Community	Name	Organization	Date Contacted
Cambridge Bay	Jim MacEachern	Hamlet of Cambridge Bay	Apr 27, 2012 *teleconference meeting with Hamlet Jun 1, 2012
Cambridge Bay	Beth Sampson	Kiiliniq High School	**May 10, 2012 (phone call and email corres, email corres attached)
Cambridge Bay	Fred Pedersen	Kitikmeot Inuit Association	Jun 11, 2012 (email attached)

*We had a teleconference meeting on June 1, 2012, with three representatives from the Hamlet – Jim MacEachern, Stephen King, and Deputy Mayor Keith Sr. Lear. They were very interested in the project, provided helpful advice, and a request for a letter of support will go to council shortly.

**Beth Sampson is a science teacher who has indicated an interest in the project; we hope to work with her to use the observatory as an educational opportunity at the high school.

Further note: We have also left phone and email messages for the Cambridge Bay Hunters and Trappers Association (Apr 24, 2012) but have not had any significant contact. We will continue to work to engage the community in the project.

2. How will the proposed project benefit Nunavut?

Daily measurements of seawater properties and ice thickness in Cambridge Bay, which will be of interest to scientists but may also be useful for the local community.

Live data and underwater video feeds for schools to increase awareness of marine environment. We hope to provide a computer station streaming live data in the local school.

Technical training and part-time employment opportunities for Cambridge Bay residents. We will likely have to have a local person on retainer to attend to problems with the network.

4. Describe and attach documentation regarding community support or concerns for the proposed project:

See attached project description and map.

5. Is there a traditional knowledge component to this research project? If yes, please explain:

No.

SECTION 8: GENERAL QUESTIONS

1. Do you give NRI permission to publish project information in the Nunavut Research Institute Annual Compendium of Research Undertaken in Nunavut?

YES

No

3. In addition to the application form, applicants are required to submit additional information in an electronic format to the Manager, Research Liaison, cfilion@nac.nu.ca. Please check that the following have been submitted to NRI:

- Project Summary** -in English and Inuktitut (+Inuinnaqtun, if in the Kitikmeot)
 NTS Maps of the project

Applicant:



Director, NEPTUNE Canada

June 14, 2012

Signature

Title

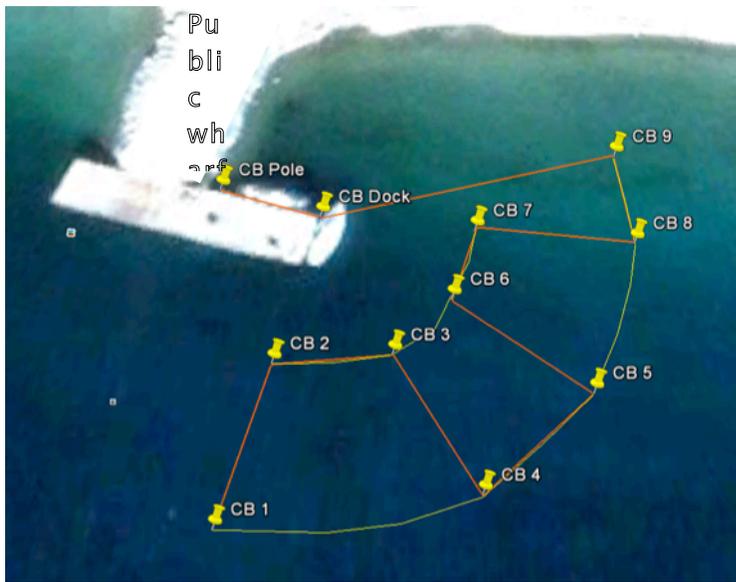
Date

Cambridge Bay Undersea Observatory – a NEPTUNE Canada Initiative

NEPTUNE Canada, a division of Ocean Networks Canada, based at the University of Victoria, in Victoria, BC, would like to install a cabled undersea observatory in Cambridge Bay, as soon as the summer of 2012. This observatory would be the first location in Canada's Arctic for year-round monitoring of the marine environment. This would improve the knowledge of the northern environment and aid in the protection of fragile arctic marine ecosystems. It would create scientific and technical training opportunities for residents of Cambridge Bay, and there would be some local employment opportunities associated with the installation, operation and maintenance of the observatory infrastructure. The project also represents a pathfinder experiment for the future Canadian High-Arctic Research Station (CHARS), to be built in Cambridge Bay by 2017. This site was preferred for several factors: the existing community and infrastructure (power, airstrip and dock) and the opportunity for science education at the local school, the outreach potential both to the local community and to the cruise ship visitors.

NEPTUNE Canada currently operates a very large deep ocean observatory off Vancouver Island and a mini-observatory at Brentwood College near Victoria where high school students use data collected by underwater instruments for their science classes. Cambridge Bay would have a similar design, where the live data and underwater video feeds collected would be available for use by the local school. The data collected would also be made available to the public both locally and nationally and to researchers, which may result in publications. All data will be archived for long-term study of the changing ocean environment in the Arctic.

Our proposal is to install a mini-observatory in Cambridge Bay that would operate for a period of 5 years. An underwater instrument platform would be placed on the ocean floor at 10 metres depth, at a reasonable distance from the anchorage area, and be connected by cables to a breakout box on the public wharf that would provide power and communications. The instrument platform would host an underwater camera and underwater microphone, and a suite of sensors to measure seawater properties, plus an instrument to measure ice thickness. From the wharf, data would be transmitted over a wireless link to the school. An Internet connection would be used to make data available beyond Cambridge Bay. The project would be decommissioned in August 2017 or sooner; at this point all parts will be removed.



Potential locations (CB1–CB9) for underwater observatory in Cambridge Bay. The observatory would be connected by a 50-metre-long cable to a shore station (CB Pole), located on the public wharf.

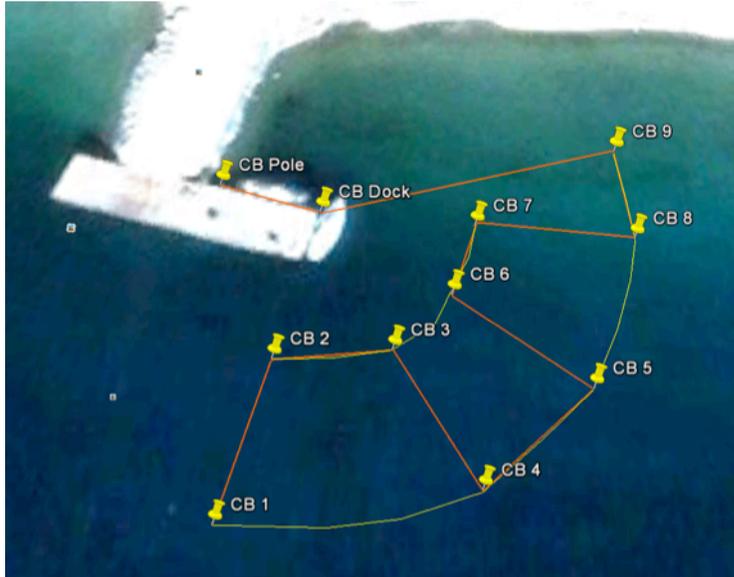
Iqaluktuuttiaq Taryum Iluani Qauyihaiyaiyut – hamna NEPTUNE Kanatam Pigiartitiniq

NEPTUNE Kanata, hamna aviktuqhimayuq haffuminngat Taryuq Qaritauyakkt Piliridjutikhait Havaktut Kanata, atulihaaqhutik uvani Iliharvigyuangat Victoria, Victoria, BC mi, illiriyumayangit alruyartuqtuq taryum ataani qauyihaiyaiyut Iqaluktuuttiarmi, qilamiurtumi auyami 2012 mi. Una qauyihaiyaiyut hivulliuatuniahuni nayurvikhami Kanatam Ukiuqtaqtumi ukiuraalungmi amiqhailutik haffuminngat imarmiuttat avatinut. Hamna pivalliagiangani qauyimayangit ukuninngat qutingnikpaakkt avataat unalu munarilugu hapumminahuarlugit hiqumilaartuq ukiuqtaqtum imarmiuttat uumayut. Pivallianiahuni qauyihaiyut unalu qauyimattiartunut ilihautiyakhat hulidjutikhait nunaqatigiiktut Iqaluktuuttiarmi, unalu ilait nunaqatigiit havaaniklutik hulidjutikhait ilaliutiyut ukuninngat illiriyaulutik, aulattitilutik ihuaqhailutiklu haffuminngat qauyihaiyaiyut igluqpaqarvikhaliurutikhait. Hamna havaariyakhaq kiuvikhautiliglu hivulirtikhamik qauyimattiartumik hivunikhami Kanatami Qutingnikpaakkt–Ukiuqtaqtumi Naunaiyaivikhaq (CHARS), igluliurlutik Iqaluktuuttiarmi 2017 nguqtinnagu. Hamna nayurvikhaat ihumagiyaulluaqhimayut amihuuyut ihumagiyaayut: itquumagamik nunalingnit unalu igluqpaqarvikhaliurutikhait (paualingnik, milvik, unalu tulagvik) unalu piyumayauniq haffuminngat qauyihainirnut ilinniarniq uvani nunaqatigiiktunut iliharvingmi, unalu tunihilugit pidjagiktumik tamainnut nunaqatigiiktut unalu umiaryuat pulaaqattartut.

NEPTUNE Kanata tadjia aulattitiyut angiyaartumik hitiyunit taryumi naunaiyaivik iluni Vancouver Qikiqtami unalu mikiyumik–naunaiyaivik uvani Brentwood Iliharvigyuanga haniani Victoria taimaa inuuhuktum ilinniarvik iliaqtut atuqattarpagait naunaiyaivlutik kititiqhutik ataani imaup ingilrutilik qauyihaiyaiyumi ilinniarvianni. Iqaluktuuttiaq adjikkutaani taimailulaaqhutik, taimaa inuuhimayut naunaiyainiit ataani imaup qunnialiurtamingnit naunaiyaivlutik kititiqhimayangit aturnaqhuni nunaqatingni ilinniarvingmi. Una nalunaiyaiyut kititirtangit kinaliqaak aturumagumiuk kitkutuinnarnut tamainnut nunaqatigiiktut hilaryuarmiluniit qauyihaiyinut, taimaa makpiraaliuriani. Tamaat naunaiyaiyut tutquumaniartangit aturaariangani ilihautikhait haffuminngat aallanngulirtumi taryuq avatanit iluani Ukiuqtaqtumi.

Hamna tukhiutihimayavut illirigiangat mikiyumik–naunaiyaivikhaq Iqaluktuuttiarmi amiriyauqhuni tallimanit ukiunganit. Hamna ataani imaup ingilrutaa tunngavia illiriyauqhuni qulaani taryum natiani uvani 10 miitatigut ukturautainit aktingnia, uvani nakuuyumik unghingniani haffuminngat kiharviat iniani, taimaa katilviuniaqhutik alruyarturtunik uvani nappaqhimayumik qiyuqutaanit uvani kavamatkunnit tulagviani ilaliutigiangani pauanit turaarutikhainit. Una ingilrutik tunngavia imaup iluani piksaliurutiqarluni unalu imaup iluani nipiliurutinit, haffuminngalu mihingnautikhat ukturautiyakhait hulivaktut imaq iluani uuminngalu ukturautinit ingilrutinit uktuutikhanut hikum ivyuninga. Haffuminngat tulagvia, naunaiyaiyut turaartitauniaqhuni uuminngat alruyattumik katilviuniq ilinniarvingnut. Ua Qaritauyakkt katilviuniq

aturtauniaqhuni naunaiyaivikhait aturiangani avataani Iqaluktuuttiaq. Una havaariyakhaq havaktaulihaarniartuq Aagasimi 2017 mi, qilamiurtumiluniit; tadjamaat ilait ahivartaullagahuartaat.



Ihumagiyauyuq nayurvikhaat (CB1-CB9) haffuminngat imaup ataani naunaiyaivikhaq Iqaluktuuttiarmi.

Una naunaiyaivik katilviuniaqhuni haffuminngat 50-miitatigut tahiyaartuq alruyarnik hamunga hinaani nayurvikhaa (CB Nappaqhimayuq), nayurviata qaangani kitkutuinnarnut tulagvik. .

Subject: Re: Cambridge Bay mini-observatory
Date: Sunday, May 20, 2012 2:45:57 PM PT
From: Beth Sampson
To: Christina Waddle

Hello Christina,

I've just returned with my students from the Canada-Wide Science Fair in PEI, hence the delay in my response. Thanks very much for the information on your project. It sounds like a great opportunity, and I am excited about the possibilities it may create for myself and my students to learn about this facet of oceanographic research.

I look forward to hearing more from you about the project soon,

Quana,

Beth

Quoting Christina Waddle <cwaddle@uvic.ca>:

Hello Beth,

Thank-you for the conversation earlier today. I have attached our project description; we are very keen to have Kiilnik High School involved in the project.

Let me know if you have any questions.

Cheers,

Christina Waddle | Administrative Assistant
NEPTUNE Canada
T: 250.472.5400 | F: 250.472.5370
cwaddle@uvic.ca
www.neptunecanada.ca

Subject: Neptune Canada, Cambridge Bay Project

Date: Monday, June 11, 2012 1:23:55 PM PT

From: Fred Pedersen

To: Christina Waddle

Hello Christina, your message to KIA was forwarded to me to reply to. Your project sounds interesting and would no doubt be beneficial to the schools and other researchers. KIA has no control of what happens in or on the water surfaces, all of our responsibilities are on the ground. We have no opposition to this if you get the required approvals from the Nunavut Research Institute and other regulatory bodies.

Thank you for advising us of this project.

Fred Pedersen
Director, Planning & Communications
Kitikmeot Inuit Association
Box 18
Cambridge Bay, NU
X0B 0C0
867-983-2458 ext. 228
kiadirplanning@qiniq.com
kitia.ca