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NUNAVUT WATER BOARD
NUNAVUT IMALIRIYIN KATIMAYINGI

WATER LICENCE APPLICATION FORM

Application for: (check one)

X New **___ Amendment** **___ Renewal** **___ Assignment**

LICENCE NO: (for NWB use only)

1. NAME AND MAILING ADDRESS OF APPLICANT/LICENSEE	2. ADDRESS OF CORPORATE OFFICE IN CANADA (if applicable)
Applicant: Mr. David Crockatt, *Manager Transportation Programs* *Department of CG&T, GN* *P.O. Box 2376* *CAMBRIDGE BAY, NU X0B 0C0* Phone: *(867) 983-4014* Fax: *(867) 983-4003* e-mail: *dcrockatt@gov.nu.ca*	*Consultant: Jivko I Jivkov, P. Eng.* *Principal* *Jivko Engineering* *5610, 50 A Avenue* *YELLOWKNIFE, NT X1A 1G3* Phone: *(867) 920-4455* Fax: *(867) 873-6090* e-mail: *jivko@TheEdge.ca*

3. LOCATION OF UNDERTAKING (describe and attach a topographical map, indicating the main components of the Undertaking)

The Nunavut Department of Community Government & Transportation (CG&T) is planning to construct a temporary bridge over the Aliaruhik River near the Community of Kugaaruk, NU.

The community of Kugaaruk (Pelly Bay), NU is shown on 1:7,100,000 Nunavut geographic map (*Attachment #1*). The proposed bridge site is indicated on 1:50,000 topographic map 57A/10 Login Bay, Kitikmeot Region (*Attachment #2*).

The bridge co-ordinates are: Latitude 89° 36' 48" W
Longitude 68° 25' 27" N

Aliaruhik River is 11 km long river, draining the Barrow Lake into the major river on the Simpson Peninsula, the Kugajuk River. The Kugajuk River flows into St. Peter Bay, Gulf of Boothia near the Hamlet of Kugaaruk (Pelly Bay). The proposed site is located 22 km south-east of the community, near the beginning of the river at Barrow Lake.

4. DESCRIPTION OF UNDERTAKING (attach plans and drawings)

4.1 Introduction. The bridge would be constructed over the Aliaruhik River, on a trail leading to the existing FOL site near Kugaaruk, NU. The FOL site is scheduled for clean up in summer 2001. After completion of the clean up operation by the end of September 2001 the access to the FOL site would be required no further. At that time, the bridge would be removed from the crossing and the riverbed would be restored to its original condition. The proposed bridge site was selected jointly by community representatives and Department of CG&T engineering staff.

4.2 Bridge Parameters. The Bridge Superstructure consists of single lane, 24 m long steel, twin-box girder structure. The girders would be built from rust resisting steel, which does not require surface treatment. The deck is 4.20 m wide, covered with creosote treated timber planks. On both sides of the deck, there is 0.3 m high steel railing. General Layout of the bridge and the main bridge details are depicted on the *Attachment* #3.

The horizontal clearance under the bridge is 20.0 m and vertical clearance is 1.1 m at Mean Water Level. It is estimated that the resulting opening would handle comfortably the summer flow, but would not be sufficient at peak water discharges with ice traffic during the spring break-up. Consequently, prior to the freeze-up the superstructure would be removed from the crossing and stored beyond the high water mark.

The bridge is designed according to CSA-S6-M78, for a vehicle designated as MS200-77. This is a vehicle with Gross Weight of 36,000 kg. Appropriate safety factors are included. A maximum overload vehicle with Gross Weight of 50,000 kg could travel at constant low speed without stoppage on the bridge.

The bridge would be installed on a timber pad over clean rock backfill, underlined with geotextile.

The Bridge Approaches would be 2.0 m high and not more than 9.0 m wide at the base of the fill. The part of the approaches located within the High Water Mark of the river would be constructed from clean rock fill. A layer of 0.1 m of surfacing gravel would be placed on top of the rock fill. A geotextile membrane would be installed between the natural riverbed and the imported rock fill.

The part of the approaches located within the High Water Mark of the river would be removed and the riverbed restored upon completion of the project.

Photographs of similar bridges, recently constructed in NU and NWT are shown on *Attachment #5*

4.3 General Condition of the Site. The proposed site is located in area of rapids, immediately below the beginning of the river at Barrow Lake. The surrounding area on the east of the site is generally flat, vegetated with grasses typical for the arctic tundra. Sandy/silty permafrost and gravels underlie the 300 mm thick active soil layer. On the west, the site is surrounded with rocky, non-vegetated mountains of several metres height.

At the proposed site the riverbed is 45 m to 50 m wide at High Water Level. The east bank is gravely, vegetated, fairly steep and well defined. The river channel and the west bank are flat and covered with boulders. The main channel is approximately 15.0 m wide and 0.5 m deep with occasional boulders protruded above the water level. The river is flowing fairly fast. On the west of the main channel there is a 12.0 m to 15.0 m wide gradually rising berm, where slow moving or standing water could be observed between the boulders. The remaining 15.0 m to 20.0 m of the riverbed is covered with boulders, embedded in coarse gravel and cobbles. Upstream view and downstream view of the proposed bridge site are presented on *Attachment #4.*

Due to the moderate summer precipitation in the area, the fluctuation of the water level in the river is insignificant during summer months. High water discharges occur during the spring break-up when the river spills over the west bank. There is evidence of ice traffic on this bank, most likely occurring at that time.

4.4 Existing Habitat. Information for the fish population in the river was collected through personal interviews with Mr. Guido Tigvareark Assistant SAO for Kugaaruk, who consulted community elders. It was established that there is Char-fish in the Aliaruhik River. During late June and first week of July every year, the Char migrate downstream from inland lakes towards the sea. After second week of August, the Char migrate upstream, from the sea towards the lakes to spawn. The fish run is completed before the end of August. It was also established that there is Lake-Trout inhabiting the lake upstream of the bridge crossing. Since the lake trout is not a migratory fish, individual specimens seldom are observed venturing downstream from the proposed bridge site. No other fish species are known to inhabit the Aliarusik River. This information was confirmed in a letter from the local Hunters and Trappers Association (Attachment #6).

4.5 Construction details. The installation of the bridge would take place in late July, after arrival of the bridge material on the sealift. Two local fishermen would be retained to monitor and confirm the completion of the fish-run prior to commencement of the construction.

The installation of the bridge involves two activities:

Construction of Bridge Approaches. The type of material to be used and the configuration of the approaches are discussed in the Chapter 2.4 of this submission. The construction of the east and west approaches would require 100 cu m and 500 cu m rock respectively. This rock would be obtained from rock deposits beyond the limits of any active water body on each corresponding side of the river

In order to access the west approach, construction equipment (bulldozer, loader and dump truck) would have to cross the river twice (mob. & demob). The equipment would be thoroughly inspected for leaks prior to crossing the water body. Labourers, supervisors and other construction personnel would cross the river on ATV's.