27 July 2015
NIRB File 15XN041

**PROJECT SPECIFIC INFORMATION for NIRB**

**SCREENING PART 2**

**Hamlet of Gjoa Haven, NU, Swan Lake River Bridge Construction**

## 2. GENERAL PROJECT INFORMATION

### Project Coordinates and Maps

The coordinates of the proposed bridge location are: 68°38'13.27" N; 95°59'41.17" W
We are enclosing Google Earth Maps showing the general and detailed location of the proposed bridge.
Also, we enclose two drawings showing the general layout and details of the Bridge structure.

### Project General Information

The proposed bridge is located on an existing trail leading to rich hunting grounds and places of traditional gatherings of community members. Presently, at this location, light and heavy community and construction traffic are crossing the Swan Lake River travelling directly on the river bed. In spring and early summer months, during high water discharges, vehicles have difficulties crossing the river. The bridge would offer all weather access to the lands beyond the river. It would also eliminate the continuous destruction of fish habitat in the area of the crossing.

Project funding was provided by the GN, Department of Economic Development and Transportation.

Design and acquisition of structural material was done by Jivko in 2008-2009. The construction of the bridge will be completed in two stages. The Stage One will include construction of the Bridge Abutments and the lower part of the Approaches. . The work will be completed within two weeks, at low water levels, in early September 2015. The Stage Two will include assembly-installation of the superstructure, completion of the Bridge Approaches and landscaping of the area. The work will be completed within two weeks in April 2016.

We believe the required approvals include: DFO-Fish Habitat Management, Nunavut Water Board and NIRB.

**DFO Operational Statement Conformity**
In summer and fall the watercourse at the proposed location is between 12 m and 15 m wide and less than 0.3 m deep. The riverbanks, marginally vegetated with polar grass, are of slopes 1:8 to 1:12 towards the river. The longitudinal grade of the river is less than 0.5%. At High Water Levels, for a few weeks during the spring thaw, the river runs 35 m to 40 m wide and 1.0 m deep.

According to local residents, in spring the ice on this section of the river rots and thaws on the spot without significant movement.

In 2010, we provided the DFO with project information and with the enclosed correspondence they advised us that we can proceed with the project as proposed.

**Transportation**
All structural material for the bridge construction is presently stored in the vicinity of the proposed bridge site.
The structural material was delivered to Gjoa Haven by Sealift. Transportation from the barge landing to the bridge site was done by wheeled loader.
Gravel and rock required for the bridge construction will be transported from local quarries to the bridge site by trucks using existing roads and trails.
Engineering crew related to the construction will be travelling to Gjoa Haven on scheduled flights.
Construction crew and equipment operators will be local.

**Camp Site**
There is no plan for setting a construction camp or preparation of meals on site. The construction crew composed mainly of local residents will use their own accommodation. The Engineering crew will be accommodated in the hotel.

**Equipment**
- 1 John Deer 160LC excavator Mid-size Lifting steel and backfill for abutments
- 1 Volvo L160 Loader Mid-size Loading and placing gravel and rock
- 2 Dump Trucks 7-9 cubic meter Hauling Gravel & rock from quarry to bridge site

**Water**
The bridge construction activities do not involve using of water from, or discharging water into the river.
Related to construction of the south abutment, excavator and loader will be crossing the river a total of 8 to 10 times. Pickup trucks moving construction crew will cross the river another 12 to 15 times. This will result in an average of two crossings per day for the total period of the bridge construction. It is estimated that local hunters and picnic goers are crossing the river during summer months not less than 20 times per day.

**Waste water**
There is no waste water produced in association with the bridge construction and eventual operation.

**Fuel**
Re-fueling of the equipment will be done at distance of more than 100' from the river using specialised Fuel Truck. All equipment will be thoroughly inspected for leaks of oils and lubricants on a daily basis. Equipment will be allowed to proceed with Work after repair of all

deficiencies and successful re-inspection. Equipment will not be deployed in the water for working purposes.

In the unlikely case of spill into, or near the river, the accident will be immediately reported to NWT/NU Spill Line (867-920-8130).

**Chemicals and Hazardous Material**
N/A

**Workforce and Human Resources/Socio-Economic Impacts**
The bridge construction offers rather limited opportunity for local training. Up to eight local general labourers will be employed through the local Contractor, for not more than 30 days. They will be involved in the assembly of the bridge abutments and the superstructure, as well as cleanup and landscaping of the site. Compensation for their work will be in accordance with local rates for General labour established by the local Contractor and Hamlet.

Heavy construction equipment will be operated by experienced workers provided by the contractor.

**Public Involvement/ Traditional Knowledge**
Community members were consulted in selecting the bridge site. They provided valuable information on the stream behaviour during different seasons of the year.

## 3. PROJECT SPECIFIC INFORMATION

**Project Information**
The distance by road from the community to the proposed bridge site is nearly 8.0km. The first 4.0km of this road is in fair condition, and is used for access to the community fresh water intake and to gravel sources. The remaining part is 5m wide trail, covered with thin layer of gravel. The last 120m of the access to the river are yet to be constructed.

While detailed geotechnical investigation was not carried out, it was observed that the riverbed in the section targeted for construction of the bridge crossing is covered with mixture of coarse sands, cobbles and occasional boulders. Improvised soil testing at various locations indicated that the ground surface is underlain by grey silt of nearly liquid consistency. While the depth of the liquefied silt was not confirmed, it is believed that it is part of the active layer of permafrost, which melts to a depth of 4’ to 5’ on areas exposed to sun radiation in summer.

The only location we found competent to support loading from the bridge abutments is presently used by local residents for fording the river with vehicles ranging from ATV’s to heavy construction equipment. This location, shown on the pictures above and on the enclosed Google Earth maps, is proposed for construction of the bridge crossing.

In summer and fall the watercourse at the proposed location is between 12 m and 15 m wide and less than 0.3 m deep. The riverbanks, marginally vegetated with polar grass, are of slopes 1:8 to 1:12 towards the river. The longitudinal grade of the river is less than 0.5%. At High Water Levels during the spring thaw the river runs 35 m to 40 m wide and 1.0 m deep. According to local residents, in spring the ice on this section of the river rots and thaws on the spot, without any significant movement.

## 3. PROJECT SPECIFIC INFORMATION

### SECTION I: Municipal and Industrial Development

#### Description:

The superstructure is 29m long twin-steel-girder, single-lane construction fabricated of weathering steel 350-AT, impact category 3. The design load is CAN3-S6-M78, MS250-77 consisting in 8.5m long vehicle of GVW 45,000kg (100,000lb). The design load is factored by 10% for travel off-centre, 40% for dynamic loading and additional 60% safety factor. The maximum static load, with the MS-250 configuration, that the bridge can support is in excess of 110,000kg. The bridge deck is 4.2 m wide, and is built of creosote treated Douglas fir grade 2 or better. It is composed of 8"x10" sleepers and 3"x10" runners. The deck is boarded with 0.70 m high galvanised steel rail.

The substructure is galvanized steel Bin-wall in-filled with cement stabilised backfill. There is a Geotextile membrane installed at the base of the Bin-wall. Rip-Rap is installed in front and on the sides of the Binwall for erosion protection.

#### Operation and Maintenance:

The bridge would be located on low traffic density road. Most of the bridge traffic would consist of ATVs, pickup trucks and occasional usage by construction equipment involved in road maintenance work.

It is anticipated the bridge structure would be practically maintenance free for many years. The timber deck might be in need of replacement after not less than 30 years. Sections of the guard rail would have to be replaced in case of damage from vehicle collision.

Three levels of bridge inspection will be taking place:

- Daily inspections will be carried out by the bridge users. Local drivers will be instructed to report to Hamlet any damage or deterioration they notice when travelling on the bridge
- Seasonal inspections will be carried out twice per year by local Hamlet Foreman. The bridge structure, including the underside will be visually inspected. Short written report will be submitted to Hamlet. In case of structural damages, say due to collision, Hamlet will retain a Structural Engineer to conduct appropriate assessment. In case of significant damage, the Hamlet will close the bridge for traffic.
- Five to Seven Year-Inspections will be carried out by qualified Structural Engineer. All bridge elements will be visually inspected for structural damage and regular wear tear. Detailed report, containing description of the inspected members and recommendation for repairs, if required, will be prepared and submitted to Hamlet. Hamlet will preserve all reports for future references.

#### Decommissioning

The life expectancy of the bridge is in excess of 70 years, and due to the corrosion friendly local environment, maybe 100 or more years. Cause for decommissioning could be a significant corrosion of fracture critical structural members. In such case, it is likely the existing structure will be replaced with a new one. The decommissioned structure could be disposed of in the local landfill area along with other corroded steel structures, vehicles or retired heavy construction equipment. It also could be loaded on sealift vessel and sent down south to smelters.

## Environmental Damages and Benefits

### Impact on Fish Habitat

The bridge abutments are located on dry ground beyond the water line of the time of construction. During and after construction no excavation in the riverbed or the surrounding ground will be carried out.

During the period of construction, equipment and personnel will be crossing the river a few times daily on the ford traditionally used by local travellers. We estimate, bridge construction related crossings would temporarily increase the river crossings by not more than 10%. In our opinion, such traffic increase would cost negligible additional damage on the fish habitat in the river. However, discontinuing all direct crossings after the bridge opening is considered highly beneficial to the fish habitat.

### Impact on Wildlife

Since the bridge is constructed on an existing road, and no significant traffic increase is anticipated after its commissioning, no impact on the nesting habits of migratory birds or other wildlife is anticipated.

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