

October 16, 2004

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Dear Mr. Watson,

Deh Cho Bridge Construction. Additional Information to Amend the Application for DFO Authorization

This letter supersedes our letter dated October 12, 2004 with which we are amending the Application for DFO Authorization for the construction of the Deh Cho River Bridge submitted by Deh Cho Bridge Corporation (DCBC) on March 13, 2003. The letter also summarises our discussion and the conclusions we reached on our meetings of October 08 and October 14, 2004.

I would like to take the opportunity to confirm that the DCBC has changed the originally proposed construction schedule. According to the new schedule the bridge construction activities will begin on February 01, 2005 and be completed by August 31, 2007. Detailed description and schedule of each construction activity could be found in the Appendix 1 of DAR which was made available to your office with our DAR submission.

Following is a description of the DFO concerns and requests, and our reply to them:

1. Footprint on the riverbed resulting from the bridge construction

Preamble

The bridge footprint on the riverbed that was submitted with the original DFO Application (dated March 13, 2003) reflects the preliminary conceptual design. The final design drawings enclosed to DAR include larger pier footprints of the bridge piers and widening of the North Causeway to accommodate the detour alignment.

The proposed compensation for the destroyed fish habitat resulting from these design changes is somewhat insufficient. It should be noted that the proposed compensation is not being evaluated on a basis of equal areas of destroyed and created habitat. Creation of additional habitat could be proposed to reflect and balance factors such as quality of fish habitat, time required for repopulation of the newly created habitat, and uncertainties with successful replacement of the lost habitats.

DFO Request

- a) Describe the changes to the design affecting the bridge footprint and provide corresponding drawings.
- b) In compliance with the DFO policy for “no net loss” of fish habitat, provide comparison table for Lost Habitat under the footprint and Gained Habitat from the reclamation of the North Ferry Landing and the South Ferry Haul-out.

- c) Identify additional compensation to reflect and balance factors such as quality of fish habitat and time required for repopulation of the newly created habitat.

DCBC Response

- a) Changes affecting the bridge footprint area include:
- The total the footprint area of the 8 bridge piers was increased to 630 sq m to include 6 piers @. 75 sq m and 2 piers @ 90 sq m.
 - The footprint on the South Approach was decreased to 4,800 sq m. The decrease is due to reconfiguring the embankment shoulders to a steeper slope.
 - The combined footprint area of the widening of the North Approach and the adjacent detour is 4,800 sq m.
 - A total of 4,680 sq m riverbed area around the piers was modified to include placing of 0.6 m layer of blasted rock for scour protection
 - The reclaimed areas on the North Ferry Landing and the South Ferry Haul-out remain 4,300 sq m and 9,500 sq m respectively

Enclosed are five drawings depicting the described changes.

- b) Lost/Gained Fish Habitat Comparison table as per final bridge design drawings included to DAR.

Destroyed Area		
8 piers	630	sq m
South Approach	4,800	sq m
North Approach & detour	4,800	sq m
Total Destroyed Area	10,230	sq m
Gained (Reclaimed) Area		
North Ferry Landing	4,300	sq m
South Ferry Haul-out	9,500	sq m
Total Gained Area	13,800	sq m
Net Gain	3,570	sq m
 Modified Area		
Scour Protection Around Piers	4,680	sq m
Disposal of excavated material from cofferdams (estimated 1,000 sq m/pier)	8,000	sq m
Total Altered Habitat	12,680	sq m

- c) As additional compensation DCBC proposes removal of the four causeway fingers artificially built in the Beaver Lake for the purpose of the winter crossing, some 13 kilometres upstream from the proposed bridge site. This crossing is presently being operated by the GNWT and will be abandoned after commissioning of the Deh Cho Bridge.

Although we do not have detailed measurement of the causeway fingers, we estimate that each of the four fingers covers a near-shore, prime fish habitat area of appx 130 m by 10 m resulting in a total area exceeding 5,000 sq m.

Prior to excavation the backfill material on the causeways will be tested for hydrocarbons and other contaminants. If contaminants are found, appropriate method of removal will

be developed and implemented with the participation of the GNWT in the capacity of current operator of the winter crossing. Soil test results will be submitted to DFO for review and the excavation method will be subject to the DFO approval. During excavation the area will be surrounded with reliable and well maintained silt curtain. Material will be excavated and removed to the elevation of the natural riverbed adjacent to the excavated area.

2. Destruction of fish due to pile driving

Preamble

DFO has information indicating that the process of pile-driving creates pressure waves in the water that may destroy fish in the vicinity of the pile-driving operation. DFO believes that installation of sheet piles for cofferdams and H-piles for abutments may produce pressure waves exceeding the natural fish tolerance and consequently, fish might be destroyed.

DFO Request

DCBC should implement Pressure Waves Monitoring Program throughout the process of pile installation. DFO will provide guidelines and work together with the DCBC in establishing methodology, potential mitigation measures (i.e. scare tactics, modify construction practices) and implementing the program. If, even after implementing mitigation designed to limit impacts to fish, the pile installation process still produces waves exceeding the natural fish tolerance, DFO will issue to the DCBC a Permit authorising destruction of fish.

DCBC Response

DCBC agrees to implement the Pressure Waves Monitoring Program as outlined above. It is understood that the operation of the pressure waves monitoring equipment and the data recording does not require professional training and could be carried out by the construction monitoring and supervisory staff.

3. Disposal of material excavated from the cofferdam into the river

Preamble

According to information provided in DAR the DCBC is proposing to discharge directly into the river a total of 6,800 cu m riverbed material excavated from within the cofferdams. This will result in disruption and destruction of fish habitat and is prohibited by the *Fisheries Act* unless authorised by the DFO.

DFO Request

The DCBC should thoroughly explore other alternatives for the disposal of the excavated material including disposal in existing gravel pits on land.

DCBC Response

The DCBC would prefer to return the material to the river channel rather than haul it to an off-site gravel pit for disposal. The rationale for returning the spoil to the river is based on the following:

- the material is natural and will be quickly assimilated into the riverbed downstream,
- the material will be disposed of in the fast moving water of the main river channel which is considered less valuable habitat than the near-shore shallows used by fish for spawning grounds.

Disposal of the material to off-site gravel pits will be logistically difficult and costly. It is also considered to be disruptive and temporarily destructive to the fish habitat due to significant leakage of solids in the near-shore area during transportation and off-loading and due to the damaging effect of the tug propellers during same.

Excavation of the material during winter months was the DCBC first choice, but was rejected since the natural ice build up in the river is not sufficient to support the pile driving and the excavation operation.

The proposed excavation and disposal operation will be controlled in order to maintain water quality standards for TSS/turbidity (CCME guidelines). The proposed water quality sampling program with a "feedback monitoring" objective is designed for this purpose. Preliminary assessment of the amount of sediment liberated from the glacial till riverbed material during pier excavation was undertaken by EBA (2004). They determined (using a "shake test" method) that approximately 3 % of the soil mass was liberated as sediment; also, it was estimated that the material if added gradually would result in an increase of less than 1 mg/l to the background suspended solids levels in the river. Although, their methods were admittedly crude, the results indicate that it should be possible to maintain CCME water quality standards during construction.

4. Placing rock in the river channel during summer months

Preamble

According to information provided in DAR, the DCBC is proposing to place 18,300 cu m blasted rock in the river channel for the extension of the south bridge approach in July 2005. This coincides with the spawning period of some fish species in the river and is considered to be disruptive for the same.

DFO Request

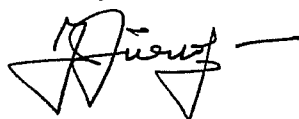
The DCBC should reschedule this activity for the winter months and to have it completed prior to the river break up in May.

DCBC Response

DCBC will reschedule the placing of the rock in the winter months and having it completed prior to the break up.

If you have any questions or wish additional information, please contact the undersigned at Tel (867) 920-4455, Fax (867) 873-6090, or email: jivko@theedge.ca.

Sincerely,



Jivko I. Jivkov, P.Eng.
Principal,
Jivko Engineering

Enclosure

Cc Andrew Gamble, Deh Cho Bridge Corporation