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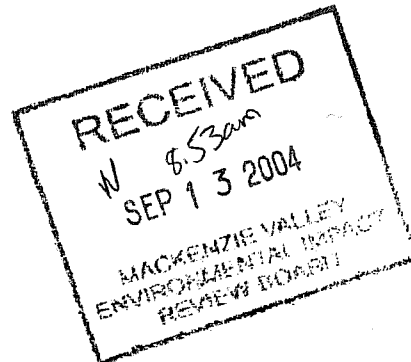
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Hi,

Please see attached Technical Analysis  
Report for the Dehcho Bridge EA -

Thanks.

Tamara





Indian and Northern  
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PO BOX 1500  
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September 10, 2004

Your file - Votre référence

Our file - Notre référence

Mr. Todd Burlingame  
Chair  
Mackenzie Valley Environmental Impact  
Review Board  
PO Box 938  
YELLOWKNIFE, NT X1A 2N7

Dear Mr. Burlingame:

**Re: Technical Analysis Report of the Developers Assessment Report (DAR) and subsequent information submitted by Deh Cho Bridge Corporation (DCBC) for the Proposed Deh Cho Bridge Environmental Assessment**

The attached Technical Analysis Report represents the Indian and Northern Affairs Canada's (INAC) review of the DAR and information received from the Information Requests by all parties and INAC's technical session.

We look forward to participating in the October Public Hearing for the above-noted Environmental Assessment.

If you have any questions or concerns regarding our technical review, please contact Lionel Marcinkowski at 669-2591.

Yours sincerely,

*DL*

David Livingstone  
Director  
Renewable Resources and Environment Directorate

Attachment

cc: Lionel Marcinkowski, Environment & Conservation Division  
Ed Hornby, District Manager, South Mackenzie District Office  
David Milburn, Manager, Water Resources  
Marjorie Fraser, A/ Manager, Lands Administration

Canada

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**DEH CHO BRIDGE CORPORATION ENVIRONMENTAL ASSESSMENT  
TECHNICAL ANALYSIS REPORT  
INDIAN AND NORTHERN AFFAIRS CANADA  
September 10, 2004**

**NON-TECHNICAL SUMMARY**

The Technical Analysis Report (TAR) represents the Indian and Northern Affairs Canada's (INAC) review of the information received between April 6, 2004 to August 25, 2004, including the Developers Assessment Report (DAR) and responses to Information Requests by all parties and the INAC technical session. INAC has provided 4 specific technical comments on the Deh Cho Bridge Corporation (DCBC) Environmental Assessment (EA). The majority of these comments were addressed, although not resolved through the Information Request stage. INAC does have two information requests that were not submitted during this stage, but would request that the Mackenzie Valley Environmental Impact Review Board (Review Board) consider these as outstanding and relevant to the EA.

INAC has provided technical expertise in the following areas:

- Effects on river substrate
- Effects on channel banks
- Effects on water depth
- Effects on water quality
- Land management
- Fuel spill contingency design
- Geotechnical conditions

According to DCBC's IR Response 2.1.2, the river substrate conditions vary between and at each pier site location, as identified in the geotechnical investigations conducted to date. In particular, pier sites #6 and #8 do not have any geotechnical data and INAC is of the opinion that further geotechnical investigation and analysis needs to be completed prior to finalizing the pier design and construction plans.

As outlined in DCBC's IR Response 2.1.8, the South Borrow Area will only contain concrete fragments and backfill material and is the responsibility of the GNWT to determine its suitability for disposal. INAC recommended that no new waste disposal areas on Crown land be created. If it is the intention of DCBC to dispose in the South Borrow Area, INAC discourages this disposal method on Crown land (the location of the South Borrow Area). It is recommended that either the North Borrow Area or another pre-existing disposal waste site be used for the concrete fragments and backfill material.

Currently, the proposed bridge development appears to be within the existing Highway

Right of Way, however, portions of the overall project (i.e. Toll collection facilities) as described in the DAR fall outside of this area. The developer's response to our IR 2.1.9, was to defer the issue to the GNWT and generally state the intent is to build in the Right of Way. Without detailed information pertaining to these facilities and their review under this Environmental Assessment, we recommend that the Review Board not approve this aspect of the proposed project. It should further be noted that any future use of Crown lands would thus be dealt with in their own appropriate manner outside this EA and may delay further processing of the project.

Lastly, INAC does have concerns with the overall design of the fuel spill containment system and the fact that this particular design has apparently not been proven on other bridge projects in North America. INAC is also concerned with the care and maintenance of the containment ditches during the winter months. DCBC concluded that the containment ditches would be lined with gravel that would contain the fuel; that any contaminated soil would be disposed of; that any accumulated snow would not be removed on a regular basis from the containment ditches. INAC suggests if this design is accepted by the GNWT Peer Review Team that the ditches be further lined with an impermeable liner or other suitable containment method and that accumulated snow be removed on a regular basis to prevent build-up in the ditches.

## INTRODUCTION

INAC is pleased to submit the following technical comments on the DCBC to the Mackenzie Valley Environmental Impact Review Board (Review Board). INAC will serve as an expert advisor in this EA, except as otherwise indicated. INAC's mandate for the Renewable Resources and Environment (RRE) Directorate is "to manage the delivery of environmental programs, implement environmental management measures, and operate an environmental laboratory. The Directorate also has federal responsibility for water resources onshore and offshore in the NWT, maintains a water quality network and conducts a number of water studies."

The mandate of the Land Administration Division is the management of land in the Northwest Territories under the control, management and administration of the Minister of INAC by virtue of the *Territorial Lands Act* and in particular, through the Territorial Land Regulations and the *Federal Real Property and Federal Immovables Act* and subsequent Regulations as it applies to Territorial Lands.

For the purposes of this EA, the Land Administration's role is that of a Regulatory Authority, for the purposes of issuing land tenure documentation [in this case a reserve to the Government of the Northwest Territories] and as an expert advisor on general land management considerations, such as reclamation/restoration requirements. We are also able to provide some expertise in assessing and mitigating potential impacts from the project on the land itself.

In the case of the proposed DCBC Project, it will be located on both, Commissioner's lands under the Government of Northwest Territories (GNWT) jurisdiction, and Crown Lands, for which we have received a request for a reserve pursuant to the above-noted legislation. The DCBC has taken steps to secure land tenure through the GNWT. The GNWT submitted a Crown Land Application to the Land Administration Division on January 10, 2003. The land application for all bridge infrastructure on Crown Land has now been distributed for comment according to INAC's standard procedures. Pending completion of the EA, INAC's review of the land applications will be placed on hold.

## **SPECIFIC COMMENTS**

### **1. Substrate and Geotechnical conditions at pier sites #1, #2 and #6**

Reference: ToR Section 4.2, Development Description, C-3 (Construction Methods), and C-11 (Modifications), and DAR Appendix 16 (25 p)  
DCBC Response to IR# 2.1.2 and 2.1.3

### **2. Land Management**

Reference: ToR Section 2 Scope of Development , Bullets 6 to 12  
ToR Section 4.2 Development Description, Lines C-6, C-8, C-10, F and G  
INAC IR # 2.1.8 and DCBC Response A and B  
INAC IR #2.1.9 and DCBC Response A

### **3. Fuel Spill Contingency Design**

Reference: MVEIRB IR #1.1.5 and INAC IR #2.1.7 and DCBC Response A and E

## **DEVELOPER'S CONCLUSION**

### **1. Substrate and Geotechnical conditions at pier sites #1, #2 and #6**

The Deh Cho Bridge Corporation (DCBC) concluded in their response to IR #2.1.2 and IR #2.1.3 that for the purpose of tendering and commencement of construction, the bridge design and construction plans are finalized. The selected foundation design is versatile and easily adjustable to the geotechnical conditions specific for each pier. The drilling of sheet piling holes will provide additional geotechnical information for the geotechnical engineer and designer. This information can be quickly evaluated and the design adjusted accordingly, if required. According to commonly adopted geotechnical practices the pier foundation design is based on the results of one test hole drilled at each pier location. This hole usually is, but in some cases may not be, fully representative of the geotechnical conditions under the several hundred square meter pier footing.

The material of the sand lenses and generally the till found in all test holes are

competent foundation materials, but are of slightly inferior capacity than anticipated during the preliminary design stage. It was considered that flat footing would be more suitable foundation for this type of material. The sand lenses originally identified while possibly being porous resulted to be of viable strength and will not have any affect on the sheet piling particularly if the work is conducted in tremie. For the piers constructed over the sand lenses the design contemplates increased thickness of the concrete footing and placing the concrete in tremie.

## **2. Land Management**

As described in item C8 of DAR, DCBC stated that "the excavated granular will be disposed of and landscaped in the North and Sough Borrow Areas, within 1 km from the corresponding ferry. The concrete fragments will be buried in the Borrow Areas and the gravel cover landscaped." INAC required further information as to what borrow area would be used, since DCBC referred to both Borrow Areas. According to IR Response 2.1.8, DCBC concluded that only concrete fragments and backfill material will be disposed of in the South Borrow Area. Also, any remaining fragments from the reclamation area will be piled and burned on site.

## **3. Fuel Spill Contingency Design**

According to DCBC in section C-7 of the DAR, a major spill on bridge deck is a low probability, but possible. It would be refined petroleum products that would be spilled onto the deck, and subsequently into the containment ditches. Existing regulations for transportation of dangerous goods and spill contingency planning would apply. This prompted an Information Request from INAC, in order to further understand DCBC's spill contingency design.

## **INAC'S CONCLUSION**

### **1. Substrate and Geotechnical conditions at pier sites #1, #2 and #6**

INAC does agree with the DCBC's assessment of the pier footings and geotechnical investigations, but stresses the importance of a more detailed geotechnical analysis prior to finalizing the bridge and pier constructions plans and commencement of bridge construction.

### **2. Land Management**

INAC's review has been based upon the information provided in the Project Description, Developer's Assessment Report and subsequent revision prepared by Deh Cho Bridge Corporation or presented in Information Requests, meetings

with Deh Cho Bridge Corporation and the Technical Sessions July 13, 2004. From land administration perspective, impacts from the described project are felt to range from minor to negligible and can be addressed through the mitigation actions outlined by Deh Cho Bridge Corporation or implementation of the following general comments and recommendations on the overall project and the noted specific comment respecting waste disposal and additional project land requirements.

### 3. Fuel Spill Contingency Design

INAC does agree with DCBC that in the event of a significant fuel spill there is the potential for soil contamination and stability issues with the design as submitted.

## INAC's RATIONALE AND EVIDENCE

1. **Substrate and Geotechnical conditions at pier sites #1, #2 and #6**  
The DCBC is relying on substrate and subsurface conditions based on the geotechnical conditions observed at the other locations, in order to finalize its pier design and construction plans. It has been identified that the substrate and subsurface conditions vary between pier sites, as noted by the geotechnical investigations and particularly between pier sites #1 and #2 and #2 and #3. Also, it has been identified that in some cases the geotechnical conditions may vary over several hundred square meter pier footing.

The DCBC indicated that the sheet pile holes at each pier location will provide additional geotechnical information. The geotechnical engineer and designer will quickly evaluate this information and the design will be adjusted accordingly. With the somewhat short timeline for pier construction (i.e. freeze-up ice movement), it will be difficult for the design engineer and the designer to adjust the construction or design of the pier footing. Furthermore, if conditions are inconsistent or unfavourable beneath the entire footing area, especially when pier sites have limited or in some cases no geotechnical information.

Although one test hole was drilled and analyzed at proposed pier sites #1- #5 and #7 (according to commonly adopted geotechnical practice) currently no information exists at pier site #6. At pier site #8 the test hole was not situated at the actual pier location, it was shifted onto the edge of the jetty (p. 4, EBA Report). This jetty is approximately 40 metres northwest of the actual pier site. However, with no information at the exact location of pier site #6 and to a lesser degree pier site #8, it is difficult to finalize the pier design and construction plans.

## 2. Land Management

In general, we found the policies and guiding principles of DCBC for land use to be consistent with accepted Crown land management practices and requirements for land use.

The DAR at F.2 on page 85 states, "The GNWT will lease the land to the DCBC for the term of the concession". As the GNWT submitted a Crown Land Application for reserve only at this time the GNWT will not have the legal ability to lease land to the DCBC located outside the exiting right of way as the land will not be under the GNWT jurisdiction until after the highway [bridge] is constructed and in use, exclusive of the bed of the body of water. The bed of the body of water under the bridge does not form part of the highway right of way, and therefore, does not become Commissioners' lands as per the *NWT Act*.

INAC does not support the creation of new waste disposal areas on Crown land, as it has potential to create future liability. As currently identified in the plans submitted by DCBC, they intend to dispose waste material in either the North or South Borrow Areas. The most suitable waste disposal method for dealing with concrete fragments and backfill material is in the North Borrow Area (which is Commissioner's Land) or another pre-existing disposal waste site.

## 3. Fuel Spill Contingency Design

Soil contamination should be minimized whenever possible, to prevent possible de-stabilization of the bridge abutements (soil "lubrication") and the need to excavate contaminated soils, which would further de-stabilize these areas. DCBC stated that the containment ditches will be built of gravel "capable to drain the water runoff and to contain the fuel in case of spill." INAC is concerned that gravel is incapable of containing fuel unless it is supported by an additional containment method. INAC strongly suggests a mitigation that prevents or reduces the potential impact to the surrounding environment. DCBC stated that the removal of snow would not be implemented on a regular basis, but that the carrier could be responsible for this activity if a fuel spill occurred. If a significant fuel spill occurred during the winter, the accumulated ice and snow may cause the fuel to overflow the ditch embankment and enter into the surrounding environment.

## RECOMMENDATIONS

1. Conduct a more detailed geotechnical investigation and analysis prior to finalizing the pier constructions plans and the commencement of pier construction, especially at pier sites #6 and #8.



2. We recommend approval of the project be limited to the use of the project lands for only those activities directly associated with the construction of the bridge as described in the project description and DAR. This will ensure unforeseen or new impacts resulting from the construction of other facilities or the use of this land for purposes other than the development are minimized.
3. INAC recommends that the DCBC and GNWT, as Crown Land applicants upon which the project is located, both commit to not creating new waste disposal sites on Crown land.
4. INAC recommends that the fuel spill contingency design be approved by the GNWT Peer Review Team and if approved, the containment ditch design must include an impermeable liner or other containment method, and snow/ice removal must occur on a regular basis to prevent fuel overtopping the ditches.

#### **PRELIMINARY SCREENING (INFORMATION REQUEST) REFERENCES**

Please note that these comments are submitted in addition to the Information Requests submitted to the Review Board. INAC would like the Review Board to consider them during this EA.

#### **INFORMATION REQUEST ISSUES**

INAC did not include the following issue during the Information Request period, but would request that the Review Board consider asking DCBC to follow-up with INAC further.

##### **Questions:**

1. Has DCBC considered the possibility of ice formation on the bridge deck? This may be a problem during freeze-up when the warm air from the river contacts the underside of the bridge deck. If so....
2. What de-icing method(s) will be used on the bridge deck surface? What are the potential impact(s) of the de-icer to the surrounding environment?

#### **SUMMARY OF RECOMMENDATIONS**

Conduct a more detailed geotechnical investigation and analysis prior to finalizing the pier constructions plans and the commencement of pier construction, especially at pier sites #6 and #8.

INAC recommends approval of the project be limited to the use of the project lands for only those activities directly associated with the construction of the bridge as described in the project description and DAR. This will ensure unforeseen or new impacts resulting from the construction of other facilities or the use of this land for purposes other than the development are minimized.

INAC recommends the DCBC and GNWT as applicants for Crown land upon which the project occurs, both commit to not creating new waste disposal sites on Crown land.

INAC recommends that the fuel spill contingency design be approved by the GNWT Peer Review Team and if approved, the containment ditch design will include an impermeable liner and that snow /ice removal will occur on a regular basis to prevent fuel overtopping the ditches.