

## Mackenzie Valley Environmental Impact Review Board

December 10, 2004

The Honourable Andy Scott, PC-MP  
Minister of Indian and Northern Affairs Canada  
10 Wellington  
Hull, Quebec  
K1A 0H4

Dear Minister Scott,

**Re: Report of Environmental Assessment and Reasons for Decision on the Deh Cho Bridge Corporation's proposed Mackenzie River Bridge**

The Mackenzie Valley Environmental Impact Review Board is pleased to submit the attached Report of Environmental Assessment on the Deh Cho Bridge Corporation's proposed Mackenzie River Bridge.

The Review Board has recommended that this development proceed to the regulatory phase of approvals subject to the implementation of mitigation measures committed to by the Developer.

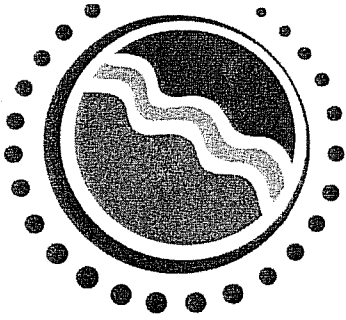
If you have any questions regarding this report please feel free to contact our office.

Sincerely,



Todd Burlingame  
Chair

Attachment



**Mackenzie Valley**  
Environmental Impact  
Review Board

Report of Environmental Assessment and Reasons  
for Decision on the Deh Cho Bridge Corporation  
**Mackenzie River Bridge**  
EA03-008  
December 10, 2004



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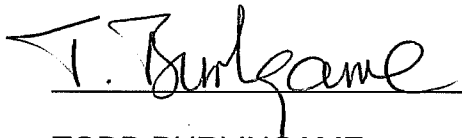
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## Review Board Environmental Assessment Decision

To make its decision in this Environmental Assessment (EA), the Mackenzie Valley Environmental Impact Review Board has relied upon all the information on the Public Record. Having considered the evidence, the Review Board has made its decision in accordance with section 128 of the Mackenzie Valley Resource Management Act (MVRMA).

It is the Board's opinion that the proposed development, considered as a whole, would not be likely to cause significant adverse impacts on the environment.

The Board has concluded, pursuant to section 128(1)(a) of the MVRMA that with the implementation of the commitments made by the Deh Cho Bridge Corporation (see Appendix A), the proposed development will not likely have any significant impact on the environment or be a cause of significant public concern and that an environmental impact review of the proposal need not be conducted.



TODD BURLINGAME

Chairperson of the Mackenzie Valley  
Environmental Impact Review Board



DATE

## Summary Report of Environmental Assessment

The Mackenzie Valley Environmental Impact Review Board (Review Board) undertook an Environmental Assessment (EA) of the Deh Cho Bridge Corporation's (DCBC) proposed Mackenzie River Bridge project according to the *Mackenzie Valley Resource Management Act* (MVRMA).

The developer, the Deh Cho Bridge Corporation (DCBC), proposes to build a permanent bridge crossing of the Mackenzie River at the current ferry crossing near Fort Providence, NT. The proposed bridge consists of 1,045 metres length of concrete decking, resting on 8 piers placed in the river. Associated development activities include quarrying, access, work camps, in-river excavation and barging. The DCBC estimates a 2 year construction phase, with the bridge open to regular vehicular traffic in the fall of 2007. Tolls will be collected from commercial traffic only.

The DCBC is a joint venture composed of the Deh Gah Got'ie Dene Band and the Fort Providence Metis members. The bridge will be owned and operated by the DCBC under a concession agreement for a period of 35 years, at which time the structure will become a public asset, owned and operated by the Government of the Northwest Territories (GNWT).

A review of the evidence on the public record has convinced the Review Board that:

- The portion of the Mackenzie River affected by the development continues to be a very important traditional and recreational use area.
- The community of Fort Providence supports the bridge project, and will benefit from the development through a comprehensive Community Benefits Plan, which was placed on the record in this proceeding.
- Concerns expressed over migratory birds, water quality, fish and fish habitat have been resolved through commitments made by the developer.

**Having considered all the evidence on the public record, the Review Board has concluded that the potential impacts of the proposed development can be mitigated if the developer's commitments are implemented.**

**The Review Board therefore recommends, pursuant to Section 128(1)(a) of the *MVRMA* that the proposed development proceed to the regulatory phase for approval.**

## **1. INTRODUCTORY INFORMATION**

This section provides background information on the referral of this development to the Mackenzie Valley Environmental Impact Review Board (Review Board) and sets out the requirements for Environmental Assessment (EA) under the *Mackenzie Valley Resource Management Act (MVRMA)*. It also provides an overview of the environmental setting and a brief description of the development proposal.

Section 2, Environmental Assessment Process, presents the Review Board's EA process and the role of each EA phase in making a determination under section 128 of the *MVRMA*.

Section 3, Public Concern, considers the extent of, reasons for, and significance of public concern.

Section 4, Impacts on the Environment, considers the environmental components that the developer was required to examine during its impact assessment of the development on the biophysical and socio-economic environment and includes the Review Board's conclusions about the environmental impacts of the proposed development and their significance.

Section 5, Summary of Recommendations and Suggestions, contains a summary of all recommendations and suggestions of the Review Board in consideration of all material on the public record (PR).

### **1.1. Introduction**

#### **1.1.1. Referral of the Proposed Development to the Review Board**

The Deh Cho Bridge Corporation applied for an authorization for 'Works Affecting Fish Habitat' to the Department of Fisheries and Oceans (DFO) in December of 2003. DFO carried out a Preliminary Screening of the proposed development according to section 124 of the *MVRMA*. DFO consulted 19 organizations during the Preliminary Screening Process.

On January 6, 2004, DFO finalized the Preliminary Screening. It referred the proposed development to EA, according to section 125 of the *MVRMA*, citing the potential for public concern related to the effects of bridge tolls on the costs of mining and exploration in the Northwest Territories. The MVEIRB notified the developer and the public that the EA had been started on January 27, 2004.

## **1.1.2. Requirements of the Mackenzie Valley Resource Management Act**

The Review Board administers part 5 of the *MVRMA* and has decision-making responsibilities in relation to the proposed development.<sup>1</sup> The Board is responsible for the conduct of an EA, which considers the environmental, socio-economic and cultural impacts of the proposed development in accordance with section 114 and section 115 of the *MVRMA*. The conduct of the Deh Cho Bridge EA was based the Board's *Rules of Procedure*.

Pursuant to subsection 117(1) of the *MVRMA*, the Board must determine the scope of the development and it must also address the factors set out in subsection 117(2) subject to any consultation with responsible ministers, if such consultation is requested. None was in this case. The Board is also required to prepare and submit a report of EA in accordance with subsection 128(2), a decision under subsection 128(1), and written reasons for decision, required by section 121, to the Minister of Indian and Northern Affairs Canada (INAC).

## **1.2. Overview of the Proposed Development**

### **1.2.1. Environmental Setting**

The environmental setting for the development has been described based on the broad definition of environment in the *MVRMA* that includes land, water, air or any other component of the environment, including the social and cultural environment.

The Mackenzie River runs approximately 1,700 km from Great Slave Lake into the Beaufort Sea. Its watershed covers roughly 1.8 million km<sup>2</sup>, draining one-fifth of Canada. With the exception of the Sans Sault and the Ramparts Rapids between Norman Wells and Fort Good Hope the Mackenzie is a flatwater river. It averages about 2km in width but narrows to less than 0.5 km below the Ramparts at Fort Good Hope and widens to over 4 km at other places. The river generally carries a high sediment load and sand bars limit barges and large boats to a shipping channel marked by the Canadian Coast Guard. The Mackenzie River usually freezes up in November, starting at the arctic coast. Break up occurs around mid-May at the southern end and in early June in the north. The barge operating season extends from mid to late June until October.

The Mackenzie River is an important migration route for several fish species. Anadromous species including arctic cisco, broad whitefish, chum salmon, and inconnu begin to migrate in late summer and fall. Some resident species spawn in spring or early summer, including emerald shiner, northern pike, and walleye (pickerel). Spawning generally occurs in tributaries, not in the Mackenzie River

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<sup>1</sup> The Minister of DIAND and responsible ministers make the final decision in consideration of the Review Board's recommendations and suggestions unless the Board orders an Environmental Impact Review.



itself. The Mackenzie Valley is an important migration route for birds, particularly waterfowl. The spring migration generally coincides with break-up. Only the fall migration overlaps with the shipping season. There are various staging and feeding areas for migratory birds along the river. Mammals commonly seen along the river include black bear, moose, beaver and muskrat.

The Deh Cho Bridge Corporations' proposed project area covers a very small area along the Mackenzie River, near the outlet of Great Slave Lake. It lies within the Taiga Plains ecozone, and specifically, the Hay River Lowland ecoregion. The Hay River Lowland, based on a geologic formation of Cretaceous shale in the western section and flat Paleozoic strata near Great Slave Lake, is located in the southern portion of the territory and in the far northeast of Alberta.

The Taiga Plains ecozone extends to the Mackenzie Delta, along the Yukon border and also includes the western portion of both the Great Slave and Great Bear lakes. The Hay River lowlands ecoregion is the smaller, more distinct region within the ecozone, encompassing the headwaters of the Mackenzie River and Fort Providence. Up to 30 percent of the ecoregion is covered in black spruce and tamarack, typical of fens and bogs. Permafrost in this area is sporadic discontinuous with low ice content.<sup>2</sup>

The climate of the Hay River Lowland, near Fort Providence is described as subhumid mid-boreal, marked by short warm summers and long cold winters. Precipitation averages 350-450mm annually, which lends itself to the trembling aspen, balsam poplar, white spruce, balsam fir and black spruce forests.

Wildlife communities are mainly composed of moose, black bear, wolf, beaver, and snowshoe hare. Woodland caribou are found in some areas.<sup>3</sup>

The Northwest Territories communities of Fort Providence and Enterprise are the nearest to the proposed construction site for the proposed bridge across the Mackenzie River (*Deh Cho*). The Deh Gah Got'ie First Nation, among many other local First Nations and Metis groups have historically used the Mackenzie River (*Deh Cho*) for traditional activities. These activities continue to be of importance today, as the area is still used extensively for fishing, hunting, trapping, berry and plant gathering on a regular basis.

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<sup>2</sup> URL of this page: [http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipln\\_e.cfm](http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipln_e.cfm)

<sup>3</sup> URL of this page: [http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipln\\_e.cfm](http://www.ec.gc.ca/soer-ree/English/Framework/NarDesc/taipln_e.cfm)

## 1.2.2. Description of the Development

The Deh Cho Bridge Corporation is proposing an alternative to the current Mackenzie River ferry and ice crossing at Km 66 of the Mackenzie River Navigation Route at Fort Providence, by constructing a permanent bridge (figure 1). The proposed bridge will be located at the existing ferry crossing and will span 1,045 metres across the Mackenzie River

The bridge will be constructed of 9 steel truss-concrete deck spans that will be supported by 8 concrete piers in the watercourse and two abutments located at either of the approach berms. Under the main span will be a navigation channel wide enough to accommodate large tug barges at a height of 22.56 metres above the high water level. The roadway on the bridge will be 10.4 metres wide, which includes two traffic lanes and a 1.5 metre shoulder on either side with 0.82 metre safety rails. All design specifications will meet Canadian and NWT standards, and will be formally approved by the Peer Review Committee<sup>4</sup>, at the request of the GNWT.

Construction is expected to take two years and to occur entirely within the highway right-of-way, roughly 2.72 kilometres in length and 60 metres wide, between km 23 and km 25 of the Mackenzie Highway. Ferry service will be maintained throughout the duration of the construction phase. However, sections of the ferry approach and bridge approach overlap, and as such, a total of 700 metres of detour will be required on both the south and north approaches. The developer has broken down construction activities into the following:

- Earthworks, including realignment of accesses to the bridge, construction of bridge approaches, riprap installation and detours.
- Pier foundation works
- Pier shafts fabrication and installation
- Abutments construction
- Steel superstructure fabrication and installation
- Bridge deck fabrication and installation
- Completion of works including paving, guard rail on the approaches, bridge signs, and landscaping

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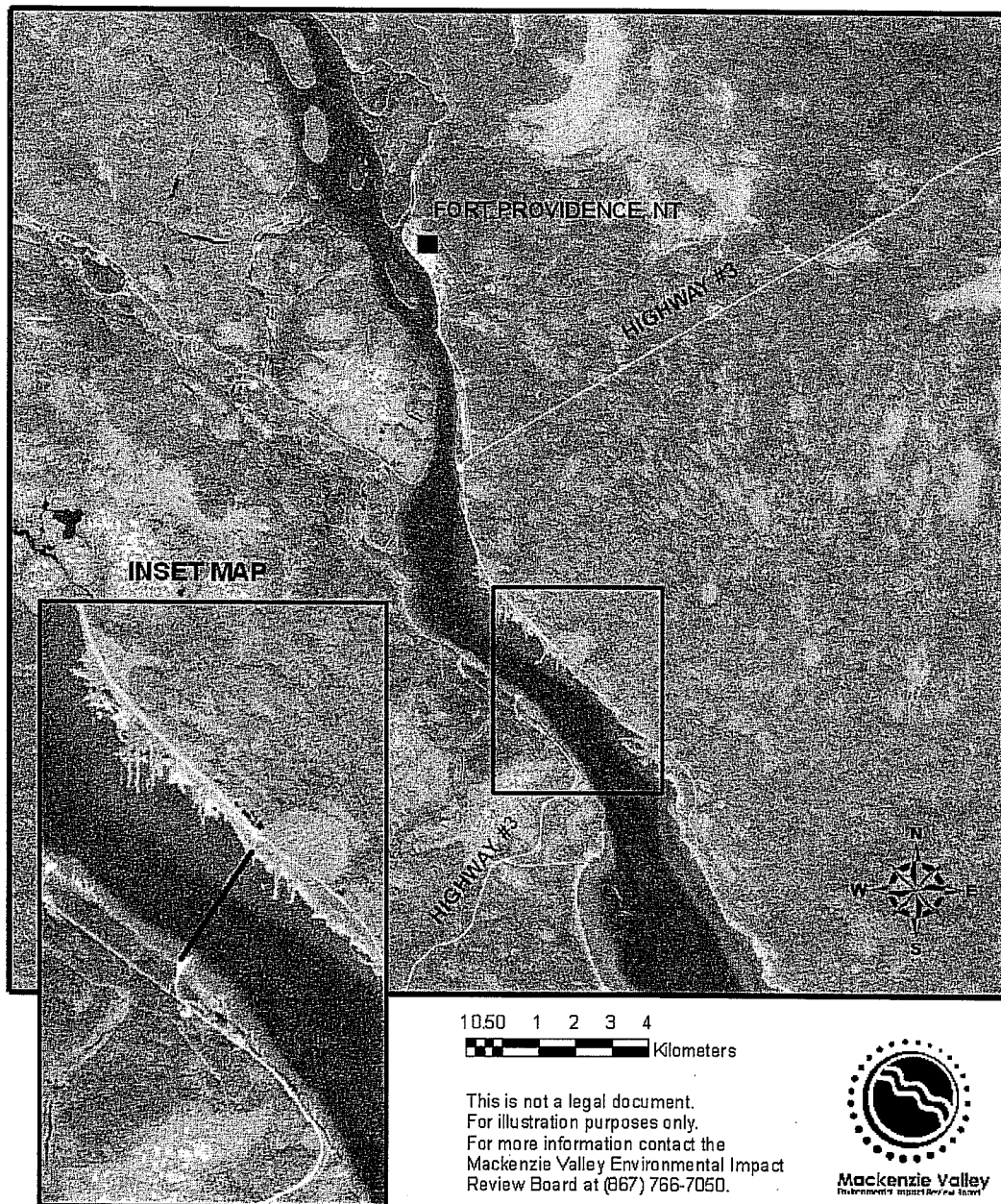
<sup>4</sup> The Peer Review Committee reports to the GNWT with the main objective of carrying out an independent design review and conformity check of the DCBC design with the current Canadian Bridge Code. The final PRC report will be a public document (PR#88).

The requirement for land in the construction of the bridge is limited to the following:

- Construction corridor for bridge structure and approaches
- Area for temporary construction camp
- Two areas (on either side of the river) for construction and operation of temporary concrete plant
- Two areas in the vicinity of the bridge for temporary storage and parking
- Two reclamation areas associated with removal of existing ferry infrastructure
- Seven quarry areas for granite, limestone and gravel

A work camp will be located near the existing ferry camp, on the south side of the river. The camp will be able to accommodate up to 60 people, and is expected to be occupied during a 20-month construction period. Water, fuel storage, sewage and solid waste removal will be conducted according to environmental standards and conditions set out in the regulatory permits issued by the MVLWB.

# EA03-008 Proposed Mackenzie River Bridge Location



December 2004

Figure 1 - The Mackenzie River Bridge Project Location Map  
Source: Deh Cho Bridge Corporation

## 2. ENVIRONMENTAL ASSESSMENT PROCESS

### 2.1. Parties to the EA

There were 6 registered parties to the Environmental Assessment (EA). According to the Review Board's *Rules of Procedure*<sup>5</sup>, the developer is deemed to be a directly affected party. The remaining 5 registered parties were composed of government departments and other organizations. They included:

- Government of the Northwest Territories (GNWT)
- Indian and Northern Affairs Canada (INAC)
- Hay River Metis Council and NWT Metis Nation
- Department of Fisheries and Oceans (DFO)
- Environment Canada (EC)

During the EA process, representatives of government departments had the opportunity to identify their interest and to notify the Review Board of their Minister's intent to participate in the proceeding in the role of a "responsible minister", as defined in section 111 of the *MVRMA*. The responsible ministers play a role in the decision-making process. Included in this category are the Ministers of DFO, EC, and the RWED-GNWT. The Minister of INAC is the federal Minister as defined by the *MVRMA* and plays the central decision-making role in the EA.

### 2.2. EA Approach

The EA process had three phases: a scanning phase to define information needs and to describe the development and potential impacts; an analysis phase to explore the reasons for public concern and associated environmental issues; and a decision phase to consider, evaluate, and weigh evidence in order to render an EA decision. Figure 2 shows the various phases of the EA and which tasks were undertaken in each phase.

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<sup>5</sup> MVEIRB. *Rules of Procedure for Environmental Assessment and Environmental Impact Review Proceedings*. (May 2002).

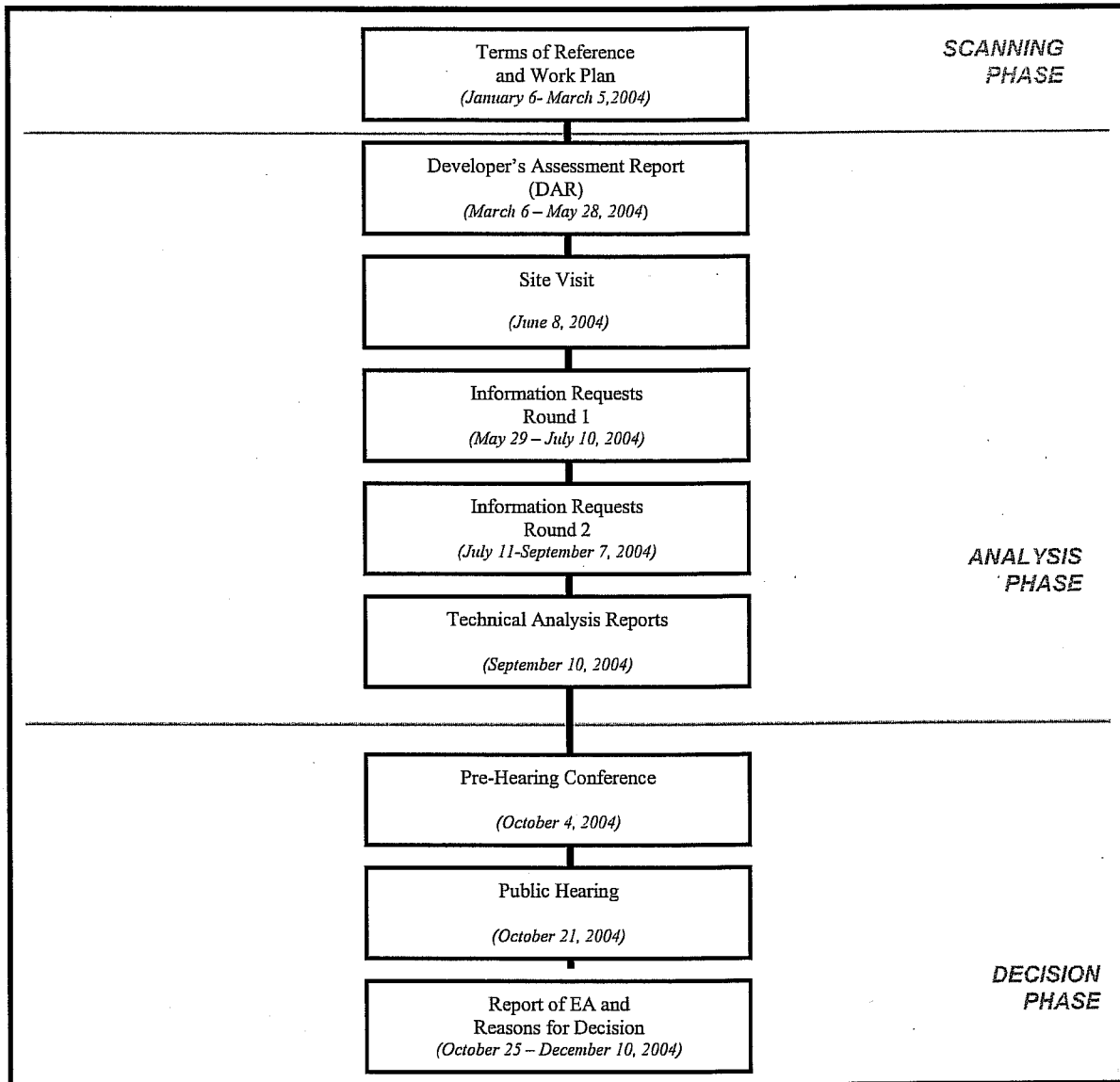


Figure 2 – Deh Cho Bridge Corporation Mackenzie River Bridge EA03-008 Process

### ***Development of the Terms of Reference and Work Plan***

The Review Board issued a *draft Terms of Reference and Work Plan* for the EA on February 4, 2004. The documents were distributed to organizations that wanted to remain on the distribution list.<sup>6</sup> Comments on the draft were received from February 9 to February 25, 2004. DCBC, Environment Canada, INAC and GNWT-RWED submitted comments that were considered by the Review Board.

The final *Terms of Reference and Work Plan* was issued on March 5, 2004. The Terms of Reference determined the scope of development and scope of assessment and provided direction to the Deh Cho Bridge Corporation and others about their roles, responsibilities and deliverables in the EA process. The Work Plan established the milestones and identified the Review Board's timelines and expectations for the completion of the EA.

In general, the Work Plan was closely adhered to and there were no requests or concerns expressed by the parties for amendments through rulings of the Review Board.

### ***Submission of the Developer's Assessment Report***

The Developer's Assessment Report (DAR) was prepared according to the *final Terms of Reference* issued by the Review Board. The Review Board received the DAR on April 7, 2004 (PR # 40). The DAR was deemed to be in non-conformity with the final Terms of Reference by the Review Board on April 21, 2004 (PR#50). The DCBC submitted a revised version of the DAR on May 25, 2004 (PR#55) which was found to be in conformity with the final Terms of Reference by the Review Board on May 28, 2004 (PR#58).

### ***Site Visit***

The Review Board conducted a site visit of the DCBC's proposed Mackenzie River Bridge project near Fort Providence on June 8, 2004 (PR#64)<sup>7</sup>.

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<sup>6</sup> These organizations were Salt River First Nation, Liidli Kue First Nation, GNWT-RWED, Jacques Whitford Environment Limited, City of Yellowknife, Dogrib Treaty 11 Council, Fort Providence Resource Management Board, Environment Canada, Akaitcho Territory Government, Town of Hay River, GNWT-DOT, NWT Metis Nation, Department of Fisheries and Oceans Canada, INAC, Fort Providence Metis Council, Deninu Kue First Nation, Yellowknife Chamber of Commerce and the Fort Norman Metis Land Corporation. Not all organizations decided to be parties to the EA.

<sup>7</sup> The site visit of June 8, 2004 consisted of a tour of the current ferry crossing and proposed bridge site as well as a visit to the community of Fort Providence and a presentation of the development description by the Deh Cho Bridge Corporation representatives.

### ***Information Request Phase***

The Review Board authorized two rounds of Information Requests (IRs). The first round of Information Requests was developed by the Board and a total of 5 IRs were issued to the Developer and parties on June 30, 2004 (PR#73). Responses were due July 9, 2004. The second round of Information Requests was based on requests put forth by the parties and approved by the Board. A total of 21 IRs were issued to the developer and parties on July 26, 2004 (PR#82). Responses were due August 24, 2004.

### ***Pre-Hearing Conference***

On October 4, 2004 a pre-hearing conference was held in Yellowknife by Review Board staff and legal counsel. The public was notified via newspaper announcements. Parties to the EA and the public were invited to attend.

The pre-hearing conference was devoted to a discussion of the hearing process and procedures, and to setting a draft agenda for the public hearing.

### ***Public Hearing***

A Public Hearing was held October 21, 2004 in Fort Providence. The public was notified of the Public Hearing by means of public radio announcements, posters in the community and newspaper ads. The principal goal of the Public Hearing was to allow the public an opportunity to hear and participate in a discussion of technical issues unresolved during the EA Process leading up to the Public Hearing. It was also an opportunity to enable members of the public to speak to issues they considered to be of importance.

Presentations were delivered by the developer and several other parties to the EA. All parties to the EA had the opportunity to question both the developer and other parties to the EA. The scope of the hearing addressed the direct and indirect impacts highlighted by the parties.

### ***EA Decision***

The Review Board will provide the Minister of INAC and the regulatory authority (MVLWB ) with its *Report of Environmental Assessment* as per section 128(2) of the *MVRMA*. The developer and the other parties will also receive copies of the *Report of Environmental Assessment*.



### 2.3. Determination of Significance

Section 128 of the *MVRMA* requires the Review Board to decide, in its opinion, based on all the evidence on the public record, whether or not the proposed development will likely have a significant adverse impact on the environment or be a cause for significant public concern. The Review Board's determinations in this regard are contained in this *Report of Environmental Assessment*.

The parties to the EA were asked to assist the Review Board by providing the basis for their conclusions about the significance of the potential impacts of the development. The Review Board asked the parties to identify the expertise applied and, if possible, the source of the information used as a basis for their conclusions. Ultimately, however, the Review Board is required by law to make its determination on the question of impact significance. In so doing, the Review Board considers, among other things, the following characteristics of any impacts identified:

- Magnitude;
- Geographic extent;
- Timing;
- Duration;
- Frequency;
- Nature of the impact;
- Irreversibility of the impact;
- Probability of occurrence; and,
- Predictive confidence level.

If the evidence on the public record raises issues of public concern, the Review Board evaluates that evidence both in its own right and in light of any related determinations made about the significance of the impacts caused by the development. Significant public concern is also a test under which the Review Board could refer the development to environmental impact review (EIR).

The Review Board's analysis and the reasons for its determination of the significance of the impacts, which are likely to result from the DCBC's Mackenzie River Bridge project are described in detail in Section 3 - Public Concern and in Section 4 - Impacts on the Environment.

## **2.4. Scope of the Proceeding**

### **2.4.1. Scope of the Proposed Development**

The scope of the development includes the elements of the proposed development that will be considered in the EA. The scope of development takes into account both principal and accessory development activities.

The scope of the development for this EA was limited to the description presented in the DAR and the developer's presentation at the public hearing, as amended in response to the questions of the Review Board and parties. The scope of the development assessed determines the activities, which can be undertaken, pursuant to any subsequent land use permit, water license or other regulatory instruments. These activities may not exceed the scope of this EA without the potential for further preliminary screening.

Based on the developer's evidence, the Review Board identified the principal development components to be as follows:

- Construction of a 1,045 metre bridge, consisting of nine continuous spans made of steel girders and concrete deck composite.
- Construction and installation of eight piers in the Mackenzie River consisting of cast-in-place concrete flat footings, concrete pedestals and structural steel shafts.
- Construction of two concrete abutments supported on steel piles.
- Construction of two 12 metre wide road approaches; using clean blasted rock in the river bottom to elevate the approach base to one metre above the Mean Navigational Water Level, followed by backfill and an additional one metre thick layer of rip rap.
- Paving of the roadway approaches.
- Excavation, removal and disposal of structural material and backfill from existing ferry landing sites. Restoration of river bottom at these areas.
- Construction of road access detours for public and commercial vehicles to ferry landings, during bridge construction.
- Reclamation of the temporary ferry landings
- Granular and blast rock locations and their geochemical characterization

- Development and abandonment of quarries, as necessary
- Location, construction and operations of the toll collection facilities
- Additional infrastructure in support or connection to the bridge development such as, but not limited to the proposed toll station, roadside pullout, parking areas for attendants and highway users, proposed highway realignments.
- Location, description and timetable of areas required for camp, storage, working area, concrete area and concrete plant.

#### **2.4.2. Scope of the Environmental Assessment**

The scope of assessment describes the components of the environment that will be evaluated for impacts from the proposed development. In determining the scope of assessment, the Review Board was conscious of its obligation under subsection 117(2) of the *MVRMA* to consider:

- the impact of the development on the environment including the impacts of malfunctions or accidents;
- any cumulative effects that are likely to result from the development in combination with other developments; and,
- comments submitted by members of the public.

After considering the relevant information available on the public record, the Review Board decided on the scope of assessment. The Review Board notes that DFO referred the development to Environmental Assessment because of potential public concern, regarding effects of bridge tolls on the cost of mining and exploration in the NWT.

The public record of the Preliminary Screening provided some material for the Review Board's EA consideration, in accordance with section 117 of the *Mackenzie Valley Resource Management Act* (MVRMA), however the Board reserved the right to raise other issues in the course of the assessment, as it deemed appropriate.

The MVEIRB required more information on social, economic, cultural and environmental impacts.

### **3. PUBLIC CONCERN**

#### **3.1. APPROACH**

Public concern is not defined under the *MVRMA*. The *MVRMA* nevertheless requires the Review Board to consider public concern, and if a determination of significance is made under paragraph 128(1)(c), the Board must order an environmental impact review (EIR).

Under the *MVRMA*, no distinction is made between public concern expressed by Aboriginal people and the general public. These concerns are given equal weight although the Board makes an effort to interpret the concerns of Aboriginal people in a culturally-appropriate manner while remaining consistent with the legal context of the *MVRMA*.

The Review Board's approach to public concern includes consideration of the submissions of the parties to this environmental assessment (EA), analysis of public concern within the context of the *MVRMA*, and the Board's determination of the significance of public concern.

#### **3.2. SUBMISSIONS OF THE PARTIES**

Early in the EA, the Review Board heard concerns expressed from the NWT and Nunavut Chamber of Mines over the potential for commercial bridge tolls to negatively impact the cost of mining and exploration in the NWT. However, this concern was officially withdrawn by the NWT and Nunavut Chamber of Mines in their February 4, 2004 correspondence (PR#18).

The Review Board also had the opportunity to hear directly from members of the public in Fort Providence at the Public hearing that was held October 21, 2004. Several questions by the public were posed to the developer about potential environmental effects such as contamination, spills, bird nests and tolls (PR#130, p135). Other public questions and comments were related to the distribution of community benefits and harvester compensation related to the bridge project (PR#130, p156).

#### **3.3. ANALYSIS**

Part 5 of the *MVRMA* makes provision for the Review Board to address public concern, which arises in the context of environmental impact assessment processes. When such evidence is heard in an EA, the Review Board must decide how to respond. This analysis explains the approach adopted by the Board to address the evidence of public concern heard in this proceeding.

Part 5 of the *MVRMA* provides the legal framework within which public concern is considered in the environmental impact assessment process.

Preliminary screeners exercising their decision-making authority under paragraph 125(1)(a) of the *MVRMA* can make a referral to the Review Board if, in their opinion, the development might be a cause of public concern. That is what happened in the case of the Deh Cho Bridge Corporation's proposal for the construction of the Mackenzie River Bridge. The test for public concern in paragraph 125(1)(a) is a low one. The *MVRMA* does not give any direction to preliminary screeners or the Review Board about how to measure public concern. As Parliament has provided the screening decision-makers with a subjective test and a low threshold for public concern, the Review Board must conclude that the EA process is intended to address any public concern which results in a referral from the preliminary screening stage.

The context in which public concern is raised in paragraph 125(1)(a), like the context in section 128(1), leads to the inference that the *MVRMA* is talking about public concern about the impacts on the environment that might result from a development. Part 5 is about environmental impact assessment and the process described is directed at the identification and, if possible, mitigation of significant adverse environmental impacts. When the broad scope of the definition for the term "impact on the environment" in section 111 of the *MVRMA* is considered, it is clear that public concern about impacts on the environment can encompass a wide range of issues, including effects on the social and cultural environment and on heritage resources.

Paragraph 128(1)(c) of the Act continues the *MVRMA*'s focus on the theme of public concern and makes this matter a determinant in a decision of whether or not an Environmental Impact Review (EIR) should be ordered by the Review Board. There must, however, be "significant public concern" before the Review Board can exercise its discretion to order an EIR. This establishes a higher threshold before an EIR can be ordered on the basis of public concern.

Paragraph 117(2)(c) of the *MVRMA* requires the Review Board to consider the public's comments on a proposed development. Thus, in the Review Board's view, the statute anticipates that the EA process will address public concern that has led to a referral or that will arise during an EA process. The result is an EA process that includes a review, analysis and determination by the Board of public concern, as well as on the other factors set out in subsection 117(2).

Upon review of the statutory scheme, good environmental impact assessment process and the evidence in this EA, it is clear to the Board that mitigation measures to alleviate adverse environmental impacts should also alleviate public concern about those same impacts. Some of these measures, in addition to the community engagement process required by an EA, may address public concern

directly, but the Review Board is also of the view that mitigation measures to reduce impacts on the environment should reduce public concern.

If an attempt to address the public concern through proposed mitigation measures is not sufficient, another possible outcome is a referral to EIR on the basis of significant public concern under paragraph 128(1)(c). This may also become an option if the EA process brings further issues to light that cause concern and if the public concerns remaining at the end of the EA process are deemed significant.

### **3.4. CONCLUSIONS**

There were issues raised before the Board during the public hearing that related to spills, tolls, bird nests, distribution of community benefits and harvester compensation. In the Review Board's opinion, the developer, GNWT and Environment Canada provided adequate responses to the questions posed by members of the public during the hearing. It is therefore the Board's opinion that there are no outstanding public concerns that have not already been addressed during the course of the EA.

The Review Board has noted all the issues raised during the course of this EA. It is the Review Board's opinion that these concerns have been adequately dealt with in the subsections of Section 4, and that any outstanding public concern is not significant. The Review Board's specific findings are set out in part 4 below.

## **4. IMPACTS ON THE ENVIRONMENT**

### **4.1. APPROACH**

#### **4.1.1. Structure of Analysis**

The impact analysis covers the biophysical, social and cultural environment. The analysis of topics below is organized under the following headings:

- Approach;
- Study Area;
- Submissions of Parties;
- Analysis; and,
- Conclusions.

#### **4.1.2. Issues Identification**

The Review Board's *Report of Environmental Assessment* is based on an analysis of issues raised through the Environmental Assessment (EA) process. The Board's approach to identifying the issues considered in this *Report of Environmental Assessment* follows.

A comprehensive listing of the issues was developed based on the evidence and comments submitted by the parties.

Some issues not discussed in this *Report of Environmental Assessment* include: issues determined to be beyond the scope of the EA and issues perceived by the Board as irrelevant or not of sufficient weight to warrant further explanation or analysis such as land administration.

The Review Board's analysis of the evidence divided issues into the following categories:

- The evidence indicated that the issue was resolved to the satisfaction of the developer and the parties to the EA or it was determined to have been resolved by the Review Board after reviewing all the evidence in the Environmental Assessment;
- The issue was raised but not pursued or carried forward to the public hearing by any of the parties;
- The issue was resolved by way of a commitment made by the developer;
- The issue was without foundation in the evidence on the public record; or
- The issue was not addressed and resolved by the developer or the parties.

As part of its analysis, the Review Board has considered all the issues raised in this Environmental Assessment. Issues that the Review Board finds to be adequately addressed or resolved by the material on the public record are not extensively discussed in this report. The only issues discussed in detail in this *Report of Environmental Assessment* are those for which the Review Board decided further consideration was warranted.

#### **4.1.3. Developer's Commitments**

The developer made a series of mitigation commitments throughout the EA process. The Review Board has compiled a table listing these commitments, based on an examination of the public record. This table is presented in Appendix A.

The Review Board considered the developer's commitments in drawing its conclusions about environmental impacts and their significance, and in setting out its suggestions. The Board's decision has been made on the assumption that the developer will fulfill all of its commitments. The Review Board's

determination of impacts and the significance of those impacts depend on these commitments. A failure by the developer to fulfill these commitments would affect the determination of the significance of the adverse residual environmental impacts.

## **4.2. BIOPHYSICAL ENVIRONMENT**

### **4.2.1. Migratory Birds**

#### **4.2.1.1. Approach**

The Developer's approach was to identify the Valued Ecosystem Components (VECs) for wildlife and wildlife habitat in general. The focus was on wildlife habitat, movement and abundance. However, as no wildlife concerns were raised throughout the course of the proceedings other than for migratory birds, only the relevant information has been gleaned for this section.

#### **4.2.1.2. Study Area**

The developer selected the study area based on the land required for construction activities as well as all adjacent lands to construction areas, quarries and watercourses draining from these areas. The key focus was the immediate project area of the proposed bridge location.

#### **4.2.1.3. Submissions of Parties**

The developer stated that the potential effects of the bridge construction and operation on birds included:

- A reduction in habitat effectiveness along the river due to increased noise from the bridge crossings
- Reduction in habitat directly through site clearing or indirectly through sensory disturbance and barriers to movement
- Sensory disturbance from road traffic along bridges may obstruct daily or seasonal movements
- Interference in nesting activity
- Disturbance during construction
- Increased mortality risks from changes in vehicular access and increased vehicle use.

Specifically, aerial wildlife (including waterfowl, raptors, songbirds and bats) may face obstruction to their flight paths, resulting in strikes on structures associated with the bridge and by associated lighting which could act as an attractant, especially during migration periods or adverse weather conditions (DAR p117).

The developer acknowledged that the greatest impact may be disturbances along the riparian area due to the volume of bridge traffic. However, the



developer believes that these potential effects may be less than those due to the current ferry operations which are occurring at ground level (DAR p117).

The following mitigation measures, in consideration of birds, have been proposed by the developer:

- Noise reduction (decreased speed limit, wooded or vegetated buffers) near the bridge would reduce noise levels, which may reduce impacts on wildlife;
- Avoid raptor nests by conducting pre-construction surveys
- Prompt reclamation of habitat where possible; or re-vegetation with non-palatable species, using native species mix
- Markers, such as aviation spheres, can be used to mark suspension lines, guy wires and appropriate infrastructure, coloured balls and flappers that warn birds of the presence of wires can reduce bird collisions
- Avoid use of solid red or pulsating lights, current research suggests that white strobe lighting is much less attractive to birds
- The bridge should have the minimal number of lights required to meet safety and regulatory standards
- Lights should have solid backing or be down-shielded to keep light within the boundaries of the bridge deck
- Lights should be directed downwards towards the bridge deck
- Lamps should be the minimum intensity necessary to meet lighting objectives and safety and regulatory requirements
- Do not use any "vanity lighting" i.e. lighting for which the sole purpose is to show off the bridge structure
- Navigation safety lights should be the minimum required by Transport Canada, and be white strobes set for shortest pulse and longest interval allowed
- Ensure bridge visual inspections are as unobtrusive as possible, particularly during the breeding season
- Restrict any obtrusive mechanical inspections and maintenance of bridge until after the breeding season (approximately 15 May - 15 July)
- If active nests (i.e. nests containing eggs or young) are encountered outside of these dates the proponent should avoid the nests until nesting is complete (i.e. the young have left the nest)
- During years of intensive bridge maintenance, prevent nesting of species, if required, through strategies such as visual or auditory deterrents or surface gels
- Low-impact construction techniques
- Reduction in speed limits and adherence to posted limits and avoid usage at night
- All collisions reported to responsible authorities
- Properly dispose of garbage in bear-proof containers to avoid attraction
- Educate workers with regards to garbage cleanup, speeding and documenting and reporting incidents and collisions

In addition, the developer was required to examine the potential for the presence of species at risk within the project area pursuant to the Species of Risk Act of Canada. DCBC identified two endangered bird species as potentially affected (COSEWIC listed): the whooping crane and the Eskimo curlew. Further research led to the developer's statement that the range of whooping cranes does not include the area to be affected by the bridge, and the Eskimo curlew is unlikely to be affected by the project, and may be extinct (DAR p118).

The peregrine falcon and Ross's gull were both identified as threatened bird species potentially located in the project area (COSEWIC listed). The developer's research indicates no suitable peregrine nesting sites, predominantly cliffs, in the project area and that RWED has no confirmed reports of its presence in the area. Ross's gull has been unofficially observed on Great Slave Lake, although it is typically considered an arctic marine bird.

Noted bird species of special concern (COSEWIC listed) include: ivory gull, short-eared owl and the yellow rail. The ivory gull is described as a predominantly arctic marine bird, possibly occurring in the project area, but not observed. The short-eared owl distribution in the NWT does not overlap with the bridge project area, nor has it been observed there. The yellow rail is distributed to the southeast of Great Slave Lake, and has not been observed in the project area.

Environment Canada expressed concern over impacts to migratory birds early in the EA process. Concerns were focused on bridge lighting, nesting on bridge structure and the potential for birds to strike the structure in flight (PR#79,99,117,130).

Environment Canada requested that the developer conduct further study on species at risk in the project area, specifically to examine territorial species lists in addition to the COSEWIC lists (PR#99,117,130). The developer obliged with this request and has committed to undertaking further study, having retained the assistance of Golder and Associates (PR#112,121,130).

Environment Canada was satisfied with the developer's commitments to the mitigative measures outlined in Golder's Wildlife Assessment (DAR Appendix 14, part F) in order to address any potential impacts by the time of the hearing. As such, there were no outstanding concerns over potential impacts to migratory birds (PR#112,117,130).

#### **4.2.1.4. Analysis**

The Review Board notes EC's satisfaction, and that all concerns about migratory birds were raised by that department. The Review Board recognizes EC's expertise in this area and repeatedly heard during the hearing that all their concerns had been met by the developer's commitments.

The Review Board is satisfied that concerns over migratory birds have been resolved based on the commitments of the developer outlined in Appendix A and the evidence of Environment Canada (EC).

#### **4.2.1.5 Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse impacts to the migratory birds of the Mackenzie River near Fort Providence, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).

- S-1 The Review Board suggests that Environment Canada and the Deh Cho Bridge Corporation collaborate in the refinement of proposed bridge maintenance procedures to ensure that mitigation of impacts on migratory birds is achieved based on the developer's commitments.**

### **4.2.2. Water Quality**

#### **4.2.2.1. Approach**

The developer selected physical and chemical changes to the quality of the water in the Mackenzie River within the zone of influence (ZOI) of the project as the valued ecosystem component (VEC) for the water quality impact analysis.

#### **4.2.2.2. Study Area**

In looking at water quality, the developer mainly focused on the immediate vicinity of the bridge itself. However, consideration was also given to the potential for impacts on the downstream water quality of the entire Mackenzie River as well as any watercourse draining from the construction and quarry areas.

#### 4.2.2.3. Submissions of Parties

The developer has identified various potential effects on the water quality of the Mackenzie River throughout both the construction and operations phases. These effects are as follows:

##### **Construction**

- Suspended sediment loading during instream construction
- Release of sediments from surface runoff
- Water contamination from spills
- Water contamination from fill/construction materials

##### **Operations**

- Sediment or contaminant release during maintenance
- Sediments release from bank erosion or surface runoff
- Water contamination from spills

The main concern for water quality impacts, according to the developer is sediment deposition and ammonia from use of blasted rock. The developer states that if sediments are released during construction, the main impacts would occur downstream of the bridge, and that these impacts would be of short-term duration. Mitigation identified by the developer to alleviate the potential for sediment deposition and other water quality alterations during construction activities include:

- 1) avoidance of the May/June spawning time for the modification of the north and south approaches (removal of causeway, addition of blasted rock, widening of bridge approach, extension of causeway, removal of backfill).
- 2) monitor ammonia levels of water during and after placement of blasted rock, testing of blasted rock prior to placement in stream, tracking ammonia levels in backwater habitats (plan to be executed by Golder and Associates, as outlined in the Appendix 14 of the DAR).
- 3) test and treat water that has been in contact with fresh concrete in the cofferdams to ensure balanced pH prior to release.
- 4) build cofferdams to isolate abutments during construction; complete construction of abutments during winter conditions.
- 5) use "industry best management practices" for explosives use, to reduce potential effects of nitrogen (ammonia, nitrite, nitrate) residue on quarried rock

Measures identified by the developer in order to alleviate the potential for the occurrence of sedimentation are:

- Building cofferdams to isolate abutments during construction; complete construction of abutments during winter conditions
- Maximizing construction during frozen river conditions
- Use industry "best management practices" for explosives use, to reduce potential effects of nitrogen (ammonia, nitrite, nitrate) residues on quarried rock
- Ensure appropriate spill response equipment is on site during all project phases

The developer also notes that there exists the potential for disruption to the water quality of the Mackenzie River, as a result of the bridge construction, due to the release of contaminants other than sediment such as fuel or chemicals. This has the potential to occur during both the construction and operations phase of the bridge, by inadvertent spills or accidents involving heavy equipment or regular traffic during bridge operations.

Mitigation identified by the developer to help alleviate the potential for spills or accidents to occur includes:

- 1) ensuring appropriate spill response training for personnel and ensuring that immediate spill response takes place if an incident occurs
- 2) incorporation of design features to allow for containment ditches at either end of the bridge as opposed to deck drains.

Overall, the developer believes the impacts on water quality will not be significant:

- The bridge footprint and construction areas are small relative to the large size of the Mackenzie River
- Construction and design plans and schedules incorporate several mitigation measures resulting in a net effect of minimizing or avoiding the potential for water quality effects
- There are benefits to water quality associated with the discontinuation of existing ferry and ice road operations.

The GNWT Department of Transportation (DOT) is responsible for the care and maintenance of the highways throughout the territory (PR#130, p124). Discussion during the public hearing raised questions to the GNWT about the potential monitoring of the containment ditches at either end of the bridge. Concern was raised that these ditches will eventually become contaminated with hydrocarbons and any other spilled material, and will seep into the Mackenzie River (PR#130, p111). Although the GNWT stated that periodic water samples are conducted throughout the NWT on bridges and roads, Environment Canada

supported INAC's suggestion to conduct an annual review of the Mackenzie River Bridge spill contingency plan (PR#130, p126).

Environment Canada (EC) is responsible for Section 36 of the Fisheries Act, which prohibits the deposit of deleterious substances into the waters frequented by fish.

EC and DFO suggested that in addition to the DCBC's proposed mitigation, Canadian Council of Ministers of the Environment (CCME) water quality standards be followed (PR#123,117,130). In the Technical Report submitted by EC (PR#99), several additional recommendations were proposed to the developer:

- Use of silt curtain and other appropriate field measures to minimize migration of suspended solids into the river
- Use of field monitoring of turbidity and Total Suspended Solids (TSS) to determine appropriate excavation and discharge rates for removal of fill materials and dewatering of pier cofferdams, respectively, such that CCME guidelines are not exceeded in the receiving environment
- Field monitoring of water quality for salinity and conductivity to confirm calcium chloride is not migrating from the detour roads into the river.

After DCBC's commitment to the proposed mitigation measures identified in the DAR, the proposed measures identified in the Golder Fisheries Assessment (DAR Appendix 14) and subsequent EA submissions (PR#99,123,130), EC was reasonably satisfied that any residual impacts to water quality would not be significant (PR#130, p66 and p82). No other parties had outstanding concerns about the potential for adverse impacts on water quality due to the construction and operation of the Mackenzie River Bridge.

#### **4.2.2.4. Analysis**

The Review Board notes that the developer's commitments have satisfied the concerns raised by EC and DFO. In reviewing the record, the Board also notes that most of the water quality concerns raised in the proceeding were raised by EC and DFO. The Review Board recognizes EC and DFO's expertise in this area and repeatedly heard during the hearing that all their concerns had been met by the developer's commitments (see Appendix A).

#### **4.2.2.5. Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse impacts to the water quality of the Mackenzie River, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).

- S-2 The Review Board suggests that changes in water quality resulting from bridge construction and operation not exceed the limits established in the Canadian Environmental Water Quality Guidelines (CCME, December 2003).**
- S-3 The Review Board suggests that the Government of the Northwest Territories conduct an annual review of the DCBC's spill contingency plan as it relates to the Mackenzie River Bridge, with particular attention to the monitoring of any contamination in the bridge runoff containment ditches.**

#### **4.2.3. Fish and Fish Habitat**

##### **4.2.3.1. Approach**

The developer recognized the potential for impacts to fish and fish habitat early in the EA and had a comprehensive fisheries assessment of the areas of the Mackenzie River affected by the proposed Deh Cho Bridge completed by Golder and Associates (DAR Appendix 14). The Golder work established existing baseline information for the area and also identified potential impacts on fish and fish habitat related to the construction and operation of the Mackenzie River Bridge, and appropriate mitigation. The VECs selected to represent fish resources in the project area were lake whitefish and northern pike, based on the 2003 capture results.

##### **4.2.3.2. Study Area**

The developer focused on the immediate vicinity of the bridge construction as the main study area for fish and fish habitat. However, consideration was also given to the potential for impacts on the downstream fish resources of the entire Mackenzie River.

#### **4.2.3.3. Submissions of Parties**

The developer identified several potential effects to fish and fish habitat throughout the course of bridge construction and operations:

- Alteration or loss of fish habitat as a result of the installation and presence of the bridge
- Fish disturbance caused by the addition of fill, cofferdam construction and the movement of equipment (sediment impacts to fish health)
- Restriction or blockage of fish passage
- Fish mortality or disturbance as a result of sediment release or chemical spills.

DFO enforces the Fisheries Act, which includes the responsibility to conserve and protect fish habitat to ensure the sustainable fisheries for all Canadians. Section 32 of the Fisheries Act prohibits the destruction of fish by means other than fishing prior to approval, and section 35.1 states that no person shall carry on any work or undertaking that results in harmful alteration, disruption or destruction of fish habitat (HADD) (PR#123,130).

The construction of the bridge will require a Fisheries Authorization, the terms and conditions of which have been under negotiation between the DCBC and DFO during the course of the EA (DAR Appendix 5).

DFO raised two main issues at the public hearing; the destruction of fish habitat as a result of bridge construction and the potential to destroy fish from shock waves caused by pile driving activities (PR#123, 130). DFO was satisfied with the following commitments made by the developer to mitigate the potential for impacts to fish and fish habitat:

- The implementation of a water quality sampling program with a feedback monitoring objective to maintain water quality standards for turbidity and suspended solids according to CCME guidelines
- Only one cofferdam will be excavated at a time and the cofferdam would be excavated over a minimum period of eight hours

In addition to the above measures, the DCBC has committed to remove backfill material associated with the existing winter crossing approaches, reestablishing approximately 5,000 square metres of important shoreline and spawning habitat. This additional habitat compensation will satisfy the DFO policy of 'no net loss' habitat, resulting in a net gain of fish habitat (PR#130).



#### **4.2.3.4. Analysis**

At the public hearing, the Review Board was advised about the fish studies that have been funded and carried out by DFO in the Fort Providence area over the last ten years. This background information is essential to Review Board EAs. The Board commends this work and would like to encourage the continuation of such programs, especially as development occurs in the region).

The Review Board notes DFO's satisfaction, and that the only concerns about fish and fish habitat were raised by DFO. The Review Board recognizes DFO's expertise in this area and repeatedly heard during the hearing that all their concerns had been met by the developer's commitments.

The Review Board notes that DFO concerns about fish and fish habitat have been resolved by the developer based on the commitments outlined in Appendix A.

#### **4.2.3.5. Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse impacts to the fish and fish habitat of the Mackenzie River, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).

#### **4.2.4. Cumulative Effects**

Cumulative effects occur when the effects of independent activities overlap in space or time to produce unintended effects on plants, animals, or people.

##### **4.2.4.1. Approach**

The developer analyzed potential cumulative effects related to the construction phase of the bridge (estimated at 2 years), the concession of the bridge (35 years) and the life span of the bridge (75 years). It was determined that the majority of the impacts would be in the short term and so more attention was paid in the DAR to the construction phase of the project and the overall contribution of the project to the cumulative development of the transportation corridor (DAR p138).

The developer chose to look at the cumulative transportation corridor impacts, cumulative socio-economic impacts as well as cumulative physical and biological impacts. Cumulative socio-economic impacts are addressed in section 4.3.1 – Socio-Economic Considerations, of this report.

The Board considered the developer's analysis while looking at the potential impacts of other past, current and foreseeable future activities upstream and downstream of the proposed bridge location at Fort Providence.

#### **4.2.4.2. Study Area**

An area was selected based on the developer's definition of the transportation corridor, which extends the length of the Mackenzie Highway from the Alberta border to Yellowknife.

The temporal boundaries of the developer's cumulative effects assessment were determined based on the transportation corridor (from winter cat-train roads to the highway, bridge and air travel) and the past, present and reasonably foreseeable future use of the Mackenzie River as a transportation route.

#### **4.2.4.3. Submissions of Parties**

The developer's analysis of the potential biophysical cumulative effects of the bridge project on the transportation corridor conclude that there will be a net reduction in siltation, fuel consumption and granular consumption as well as increased fish habitat (DAR p139). This analysis is in comparison to the existing ferry service.

The developer recognized that the majority of the impacts associated with the bridge project are likely to occur during the two-year construction phase, and that these impacts may be the greatest contributions to the long term local and regional cumulative effects. The VECs selected include: air quality (fossil fuel emissions), soil consumption, water quality and aquatic habitat.

The bridge will result in a shorter trip distance. It is estimated that the granular consumption of bridge construction is a reduction over the annual maintenance requirements for granular resources at the ferry. For water quality, DCBC foresees a small increase in siltation during construction and a reduction in siltation from erosion and prop wash, however, the variation is very small. DCBC predicts a modest net increase in aquatic habitat as well as reduced disturbance from ferry operations. Overall, DCBC concludes that the cumulative impacts of the bridge project on the air and water quality are not significant in the long term (DAR p138).

Environment Canada (EC) was generally satisfied with the developer's cumulative effect predictions after the responses to the Information Requests

(IRs) were received. In the Technical Report (PR#99) submitted by EC, no particular concerns were raised with respect to cumulative effects except to question the developer's exclusion of migratory birds (see section 4.2.1) and species at risk as Valued Ecosystem Components.

Environment Canada's specific concerns related to species at risk were that the developer did not consider potential effects of the project on species of special concern listed by the territorial government (PR#99,117,130). EC believes that it is best practice to consider all species, and not just those that are legally listed. As a result, EC proposed that the developer should further examine the potential effects of the project on species listed as 'sensitive' or 'may be at risk' under the 'General status ranks of wild species in the NWT' (PR#99,117). DCBC has committed to carry out further study of these species in the NWT (PR#112,130).

#### **4.2.4.4. Analysis**

The Review Board is required to consider cumulative effects of the development by section 117(2)(a) of the MVRMA. The Board is satisfied that the Developer's cumulative effects assessment has fulfilled this obligation by examining the potential impacts from the proposed development in combination with other past, present and reasonably foreseeable developments in the study area. The Board is also supportive of the developer's commitment to adaptive management principles.

The Board finds that the developer has considered appropriate VCs for its cumulative effects assessment.

The Board has found no significant project-specific potential impacts from this development. However, some impacts can be insignificant in isolation, but may be significant in combination with other cumulative impacts from other human activities. In the Board's view, for this development, only impacts on fish and water quality had such potential.

This development is predicted to have only very brief impacts of small magnitude on fish and water quality. In light of this, and in consideration of other human activities affecting the Mackenzie River, the Board feels that this project will not cause significant adverse cumulative impacts on the Mackenzie River. The commitments made by the developer to reduce or avoid significant impacts on fish and water quality are, in this case, sufficient to ensure that no mitigation measures are required to focus on cumulative effects for this development.

The Review Board is satisfied that outstanding concerns over cumulative effects have been resolved between the developer and Environment Canada, based on the developer's commitments outlined in Appendix A, to the satisfaction of both parties.

#### **4.2.4.5. Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse cumulative environmental impacts, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).

### **4.3. ECONOMIC AND SOCIO-CULTURAL ENVIRONMENT**

#### **4.3.1. Economic Considerations**

##### **4.3.1.1. Approach**

The Valued Components (VCs) selected by the developer in the economic assessment included:

- Local employment, during and after construction
- Local business opportunity, during and after construction
- Regional employment, during construction
- Regional business opportunities, during construction
- Net user costs/savings
- Benefits of improved access – time savings, reliability and convenience
- Net cost to government
- Net societal cost (Net Present Value of quantifiable costs and benefits).

##### **4.3.1.2. Study Area**

The spatial boundaries selected by the developer for the economic impact assessment are based on local and regional areas. The developer predicts impacts will be greater to the north of the Mackenzie River, with a direct relationship to the proximity of the project. In order of predicted degree of impact, the areas selected were:

- The community of Fort Providence
- The North Slave Region of the NWT (Yellowknife, Dettah, Tli Cho Communities, Slave Province mineral region)
- South Slave communities (Kakisa, Enterprise, Hay River)
- The Western Arctic Region communities relying on air supply from Yellowknife (NWT and Nunavut)
- The NWT

The temporal boundary used for assessment was the foreseeable future, with particular attention to the construction phase and early operations years.

#### **4.3.1.3. Submissions of Parties**

Nichols Applied Management was retained by the developer to prepare a Cost-Benefit Analysis (DAR Appendix 4b), which concluded that the project would provide an overall net benefit of \$38.6 million dollars (Net Present Value) over 35 years, resulting in an internal rate of return (IRR) of 8.5% (in comparison to a standard benchmark of 5.0% for Canadian public sector projects). Net economic benefits were predicted for all stakeholder groups (DAR p93).

The developer also examined the potential cumulative socio-economic impacts as a result of the bridge project. The Valued Components (VCs) selected for this study were local employment, local economic stimulus, regional economic stimulus, local/regional cost of living, local socio-cultural, regional socio-cultural and local land use. DCBC's predictions all indicate a beneficial impact for all VCs.

The original public concern over the bridge cited in the EA referral by DFO was related to the potential increase in exploration and mining costs in the NWT as a result of bridge tolls. However, that concern was removed from consideration by way of letter from the NWT and Nunavut Chamber of Mines (PR#18).

One member of the public spoke at the hearing, with questions to the developer related to the distribution of benefits among the bridge shareholders (PR#130, p157). The developer's response pointed to the Community Benefits Plan, and explained the details of the benefits distribution more clearly. The Board is satisfied that this concern had been adequately addressed in the Community Benefits Plan.

There were no other outstanding socio-economic concerns raised by the parties or members of the public.

#### **4.3.1.4. Analysis**

The Review Board is satisfied that socio-economic concerns have been resolved between the developer and the community of Fort Providence, based on the developer's commitments outlined in the Community Benefits Plan, to the satisfaction of all parties involved.

#### **4.3.1.5. Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse socio-economic impacts, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).

## **4.3.2. Socio-Cultural Considerations**

### **4.3.2.1. Approach**

The developer examined direct and indirect socio-cultural impacts, local and cultural heritage resources, direct and indirect cultural impacts as well as traditional and existing land use for the areas listed in the following section, with a focus on the area in close proximity to the bridge site.

The VCs selected by the developer in assessing direct and indirect socio-cultural impacts included:

- Local social impacts during construction
- Local and regional accessibility/reliability of access
- Local impacts of traffic patterns and volume
- Local sense of control and self-reliance
- Development of local skills and capacity
- Local social and cultural well-being.

The developer was asked to identify archaeological and other heritage and cultural resources in or near the project area as well as to describe any potential for direct or indirect impacts to these sites. The developer was also asked to identify potential impacts to traditional or existing land use, including recreational activities. The VCs selected for assessing land use and recreation included:

- Impacts on existing uses and activities during construction
- Impacts on existing uses and activities during operations

### **4.3.2.2. Study Area**

The spatial boundaries selected by the developer for the socio-cultural impact assessment are based on local and regional areas. The developer predicts impacts will be greater to the north of the Mackenzie River, with a direct relationship to the proximity of the project. In order of predicted degree of impact, the areas selected were:

- The community of Fort Providence
- The North Slave Region of the NWT (Yellowknife, Dettah, Tli Cho Communities, Slave Province mineral region)
- South Slave communities (Kakisa, Enterprise, Hay River)
- The Western Arctic Region communities relying on air supply from Yellowknife (NWT and Nunavut)
- The NWT

The temporal boundary used for assessment was the foreseeable future, with particular attention to the two year construction phase and early operations years.

#### **4.3.2.3. Submissions of Parties**

The developer's indirect and direct socio-cultural impact assessment identified community concern about possible negative social effects arising from the presence of non-resident workers during the construction phase. DCBC believes this has been addressed through the Community Benefits Plan:

- The construction camp is to be located outside of the community
- Contracting policies will minimize potential impacts
- A monitoring program will be established

Following the bridge construction phase, concern was raised about the potential negative impacts that can be associated with improved access as well as an increase in traffic, noise and activity. However, the developer's assessment demonstrates benefits for the development of local skills and capacity. Another positive identified was the investment of profits in community development programs and a local sense of ownership, pride and accomplishment as well as a reduction in the sense of uncertainty and isolation associated with intermittent access.

The developer consulted with the Prince of Wales Northern Heritage Centre (PWNHC), Fort Providence First Nations and other parties and did not identify any local cultural or heritage resources that had the potential to be negatively impacted as a result of the bridge project.

The developer recognizes that the construction phase of the project will considerably increase noise and traffic, and could be a source of disturbance for subsistence and recreational fishing, wildfowl hunting, camping, boating, skidooing as well as big game hunting and viewing along the Mackenzie River in the immediate vicinity of the proposed bridge. DCBC confirms that activity will be mostly restricted to the existing right-of-way, and has also indicated that the work camp will be situated on the south shore, away from favoured local-use spots.

DCBC concludes that once the bridge is constructed, the current winter access road (ice crossing), where many local residents have cabins and camps, will no longer be affected by heavy traffic during the winter. The developer also notes that helicopter use to cross the river during freeze-up and break-up will no longer be required in the future, thus eliminating another source of disturbance. The ferry and associated infrastructure will also be removed (DAR p101).

At the public hearing, Samuel Gargan, a member of the public, raised concern that two families located near the immediate project area had the potential to be

affected by the bridge construction phase. The developer assured the public that this concern was addressed in the Community Benefits Plan. Samuel Gargan was satisfied that this concern had already been addressed by the developer (PR#130, p160).

#### **4.3.2.4. Analysis**

The Review Board is satisfied that socio-cultural concerns have been resolved between the developer and the community of Fort Providence, based on the commitments outlined in the Community Benefits Plan, to the satisfaction of all parties involved.

#### **4.3.2.5. Conclusions**

Based on the evidence presented, it is the Board's opinion that the proposed Mackenzie River bridge project will not cause significant adverse socio-cultural impacts, providing the developer adheres to the measures to which they have committed throughout the EA process (Appendix A).



## 5. GENERAL CONCLUSIONS

The Review Board notes that the Deh Cho Bridge Corporation (DCBC) has considered the potential environmental, social, economic and cultural impacts that may arise as a result of the construction and operation of a permanent bridge over the Mackenzie River.

The Review Board finds that the developer has engaged in dialogue with the community of Fort Providence and the parties to the EA in order to address outstanding concerns associated with the potential for significant adverse impacts on the environmental, social, cultural and economic well-being of residents and communities in the Mackenzie Valley, to the satisfaction of the Review Board and all parties.

In the Review Board's opinion, having considered all the evidence on the public record, the potential impacts of the proposed development can be mitigated if the developer's commitments are implemented.

The Review Board therefore recommends, pursuant to Section 128(1)(a) of the *MVRMA* that the proposed development proceed to the regulatory phase for approval.

## 6. SUMMARY OF SUGGESTIONS

### *Suggestions*

- S-1** The Review Board suggests that Environment Canada and the Deh Cho Bridge Corporation collaborate in the refinement of proposed bridge maintenance procedures to ensure that mitigation of impacts on migratory birds is achieved based on the developer's commitments.
- S-2** The Review Board suggests that changes in water quality resulting from bridge construction and operation not exceed the limits established in the Canadian Environmental Water Quality Guidelines (CCME, December 2003).
- S-3** The Review Board suggests that the Government of the Northwest Territories conduct an annual review of the DCBC's spill contingency plan as it relates to the Mackenzie River Bridge, with particular attention to the monitoring of any contamination in the bridge runoff containment ditches.

## LIST OF FIGURES

Figure 1 – The Mackenzie River Bridge Project Location Map

Figure 2 – EA03-008 Environmental Assessment Process Diagram

## LIST OF ABBREVIATIONS

CCME	Canadian Council of Ministers of the Environment
CEA	Cumulative Effects Assessment
CEAA	Canadian Environmental Assessment Act
COSEWIC	Committee on the Status of Endangered Wildlife in Canada
DAR	Developer's Assessment Report
DCBC	Deh Cho Bridge Corporation
DFO	Department of Fisheries and Oceans
DOT	Department of Transportation
EA	Environmental Assessment
EC	Environment Canada
EIR	Environmental Impact Review
FPRMB	Fort Providence Resource Management Board
HADD	Habitat Alteration, Disruption or Destruction
INAC	Indian and Northern Affairs Canada
MVLUR	Mackenzie Valley Land Use Regulations
MVLWB	Mackenzie Valley Land and Water Board
MVRMA	Mackenzie Valley Resource Management Act
NWT	Northwest Territories
NWT Métis	Northwest Territory Métis Nation
PR	Public Record
PWNHC	Prince of Wales Northern Heritage Centre
ROW	Right of Way
RWED-GNWT	Resources, Wildlife and Economic Development, Government of Northwest Territories
SARA	Species At Risk Act
TK	Traditional Knowledge
VC	Valued Component
VEC	Valued Ecosystem Component
ZOI	Zone of Influence

## Appendix A – Developer’s Commitments

The table below summarizes the specific commitments made by the Deh Cho Bridge Corporation (DCBC) throughout the EA process. The commitments were taken from DCBC’s Developer’s Assessment Report (DAR), Information Requests (IRs), Technical Reports and responses, DCBC’s meetings with parties, Public Hearing and various pieces of correspondence.

Where commitments were made but are not contained in the table, DCBC is still expected to meet those commitments.

Component	Commitment
<b>Project Description</b>	
Scouring	Potential scouring will be controlled by placing on the riverbed around each pier 0.6 m layer of selected blast rock over an elliptic area with radiuses 33m and 28m (DAR p38; p128)
	Rip rap will be placed at all piers, abutments and approaches to protect against localized scour due to ice and water flows (DAR p131).
Access during construction	Access for public and commercial vehicles to both ferry landings and clear route for the ferryboat will be maintained without interruption for the duration of the bridge construction (DAR p39)
	Summer access to in-river works for constructing the piers and erecting the superstructure may employ floating barges or temporary bridges supported on the river bottom. Winter access could use the ice or temporary bridges. Any temporary fixed or floating bridges or barges would be removed before spring and fall ice traffic on the river. At no time would these temporary works be allowed to interfere with ferry operations or with marine traffic on the Mackenzie River (DAR p42, p131)
	The DCBC is committed to constructing a bridge to design specifications that do not limit the navigational needs of existing river barge traffic. This includes a deck height to account for 100 year flood levels (DAR p91; p131)
Materials	Bulk granular material would be transported by truck from identified pits and quarries. Granular material required to cross the river would be moved in the winter, via the ice crossing, not the ferry (DAR p42)

<b>Component</b>	<b>Commitment</b>
Fuel	Fuel will be delivered on site by local contractor using specialized fuel truck. Re-fuelling will take place on a designated location not less than 100 m from any water body. Trucks will be refueled at the Big River gas station located at km31, highway 3 (DAR p48)
Maintenance	Routine maintenance activities include regular inspection of all superstructure and substructure components for signs of wear, damage and erosion, and repair, if required. Special attention will be paid to any signs of erosion near the pier-footings or abutments and to the cleaning of bearings and expansion joints (DAR p69)
	The deck would be cleaned and broomed in the spring to remove accumulated sand and other debris. There are no plans to use chemical de-icers or cleaning agents, as these may accelerate bridge deterioration as well as raising environmental concerns (DAR p69)
	There will be three levels of inspections: <ul style="list-style-type: none"> <li>• Routine daily inspections</li> <li>• Annual 'checklist' inspections and,</li> <li>• Four to six year detailed inspections (DAR p69)</li> </ul>
Worker camp	There will be no fuel storage in the camp area. Solid organic wastes will be incinerated on site. Non-organic wastes estimated at 1,500 kg per month will be containerized and transported to Ft. Providence landfill area for disposal (DAR p72)
Reclamation areas	<p>Timber will be salvaged for reuse on other ferry landings. The steel will be sent to smelter in southern Canada. The concrete and the granular material will be placed below ground level and will be covered with 1 m native ground in the Borrow Areas located in the vicinity of the bridge. The disposal areas will be graded and landscaped to match the surrounding ground.</p> <p>It is possible that the material is contaminated with hydrocarbons or other substances harmful to the fish habitat. In order to establish if any contaminants are present, the GNWT Department of Transportation has commissioned a study with Dillon Consulting Ltd. It is noted that it will be the department's liability should any contaminants be found (DAR p71)</p>
	After closing of the camp all facilities and inventory will be removed from site. The remaining debris will be incinerated or disposed of in an environmentally friendly manner. The area will be thoroughly cleaned from any foreign objects and landscaped (DAR p72)

<b>Component</b>	<b>Commitment</b>
	DCBC's and DFO's agreement on a plan for no net loss of fish habitat requires the safe and clean removal of the backfill material associated with the existing winter crossing approaches, some 13 km upstream in Beaver Lake, and its complete restoration to productive fish habitat – approx. 5000 square metres of shoreline (Public Hearing p18; p63; DCBC to DFO, Oct. 18, p2-3)
<b>Regulatory Regime</b>	
	It is intended that the title to this land will be vested in the Commissioner for the GNWT. The GNWT will lease the land to the DCBC, for the term of the concession (35 years). The DCBC will make the improvements (the bridge) and lease the land and improvements back to the GNWT (DAR p85)
<b>Public Consultation</b>	
	The DCBC Board has made a commitment to members that the final decision to proceed with the project will not be made without a final public review of the project agreements by the community (DAR p86; 90)
<b>Socio-Economics</b>	
Community Benefits Plan	The DCBC is committed to having its Community Benefits Commitment Plan endorsed by the community in order for the project to proceed (DAR p90)
	The Community Benefits Commitment Plan (CBCP) commits to a workforce adjustment and training plan for impacted local ferry workers (DAR p95)
	The CBCP proposes using profits from bridge ownership for long-term investment in 1) employment and training programs; 2) business development; 3) community social development; and 4) a trust fund to continue these investments after the 35 year concession period ends (DAR p99)
	Agreement includes a guaranteed minimum \$225,000 for local businesses for bridge operations (DAR p103)
	CBCP commits to maximizing local training and employment, and local business opportunities, during bridge construction (DAR p103)
	CBCP includes sustainable economic development fund, through investment of project dividends (DAR p 104)
Forestry Harvesting	Local communities will be given first opportunity to salvage commercial forest (approx. 13.6 ha) (DAR p126)

<b>Component</b>	<b>Commitment</b>
Construction Impacts	To reduce social impacts during construction, camp to be outside community. In addition, contracting policy and a monitoring program will be established to reduce negative impacts of non-residence workforce (DAR p105)
Tolls	GNWT has committed that freight tolls will not exceed the proposed \$5-\$6 per tonne maximum (DAR p90, Hearing Transcripts p58)
	There will be no tolls on private vehicles (DAR p91)
<b>Land and Resource Use</b>	
	Construction activity, material transport and storage and camp location will all be primarily located either within the existing right-of-way or on the south shore, away from areas of local recreational use (DAR p101)
	Monitoring program and contracting policies will minimize effects of construction activity and noise (on subsistence and recreational fishing DAR p106)
<b>Air Quality</b>	
	Developer commits to having proper procedures in place to limit and handle release of air contaminants during chemical spill events, including: proper storage and handling procedures, availability of appropriate and sufficient spill response equipment, and proper spill contingency planning and training (DAR p108)
	Water or acceptable chemical suppressants will be applied to roadways to reduce dust during the construction phase. Haulage and grading will be kept to a minimum. The quarrying and crushing facility will be equipped with the proper dust suppression equipment. All construction related engines will have regular servicing to optimize fuel efficiency (DAR p108)
<b>Water Quality</b>	
	Monitoring will be put in place, particularly during the May-June spring spawning period. Feedback will be given to construction teams on water quality results (DAR p127)
	Water quality monitoring will occur during major instream construction phases. The program will include feedback monitoring to allow adjustment of construction rates and scheduling. Water quality standards for turbidity and suspended solids will adhere to CCME guidelines (DAR p134; Public Hearing p66)

Component	Commitment
	Techniques and equipment used for installation of instream piers will give precedence to minimizing amount and duration of creation of suspended sediment. Only one cofferdam will be excavated at one time and this cofferdam must be excavated over a minimum period of eight hours (i.e., slower than mechanically feasible in order to limit the amount of sediment released at any one time (DAR p128; Public Hearing p65)
	Riverbed soil removed during installation of instream piers will be removed to a gravel pit, either in summer or winter (DAR p128)
	Representative samples of blasted rock to be placed in the river will be tested to determine ammonia residue content prior to placement in the channel. If significant ammonia residue is detected a water quality monitoring program will be put in place (DAR p129)
	Silt curtains and other appropriate field measures will be used to minimize migration of suspended solids into the river (Public Hearing p87)
	Water that has come in contact with fresh concrete footings and pedestals will be removed, tested, and treated as necessary to balance the pH (DAR p129)
	Alternative disposal means will be identified and used in the event water quality of any extracted water is not acceptable for release, meaning any water that contravenes Section 36(3) of the <i>Fisheries Act</i> (EC Technical Report p11)
	During construction, appropriate spill response equipment will be on site at all times (DAR p112)
	In case of a chemical spill during bridge operations, there will be appropriate storage location, methods and handling procedures, appropriate spill response equipment on site, adequate spill response training for personnel and an immediate spill response (DAR p129)
<b>Aquatic Resources</b>	
	The May/June period will be avoided for modification of either the North or South approach to the Bridge, in order to reduce disturbance to Northern Pike and Arctic grayling reproductive patterns. Sediment monitoring will be utilized (DAR p127)
	North Approach will be altered to increase habitat by 4300 cubic metres. The restored portion of the channel will be shaped and formed to a condition resembling the natural channel. The rip rap bank protection on the outer perimeter of the abatement should be designed and placed to maximize its value as fish feeding habitat (DAR p132)



Component	Commitment
	South Approach will see the gain of 9500 cubic metres of backwater habitat immediately downstream of bridge. The morphometry of the restored area will be adjusted to resemble the conditions in the adjacent backwater (DAR p132)
	Known or potential critical habitats within the zone of influence (of construction) will be identified by construction managers (DAR p134)
	The developer will work with DFO to develop and implement a Pressure Waves Monitoring Program to monitor the pressure changes in the water during the pile driving activities. If it is determined that the pressure changes may be harmful to fish, all reasonable mitigation measures will be taken to minimize the pressure changes and harm to fish (Public Hearing p64; DCBC to DFO, Oct 18, p3)
Excavation and disposal of material	The water quality in the river and the rate of discharge of excavated material will be monitored and controlled according to methodology described in the enclosed Golder Associates Report. At least three water quality monitoring posts will be established upstream and downstream from the excavation. The rate of discharge will be reduced and adjusted if results in higher than admissible suspended fraction. This will be based on CCME water quality guidelines (DAR p87; Public Hearing p87)
Dewatering cofferdams	The water of each cofferdam will be released into the river within 24 hours continuous pumping at a rate of 80 cu m per hour. The water quality monitoring program described in Excavation and disposal of riverbed material will apply (DAR p71)
<b>Wildlife and Wildlife Habitat</b>	
	A "Texas barrier" will be installed at both ends of the bridge approach, to prevent undesired movement of wildlife across the bridge, particularly bison (DAR p118)
	Pre-construction surveys will identify (and subsequently avoid construction activities near) raptor nests and bear dens (DAR p118)
	Prompt revegetation of habitat where possible; areas near the bridge and road will be re-vegetated with non palatable species, using native seed mixes (DAR p118)
	Wooded buffers will be maintained to lessen sensory disturbance between new clearings and remaining wildlife habitat (DAR p135)

Component	Commitment
	Bridge maintenance schedules will be restricted until after the bird breeding season (15 May-15 July). Bridge visual inspections will also be as unobtrusive as possible. During years of intensive bridge maintenance, strategies to discourage bird nesting will be used, such as visual deterrents and surface gels (DAR p118). If active nests are encountered outside of typical breeding season, they will be avoided until nesting is complete (EC Technical Report p9)
	Markers, such as aviation spheres, will be used to mark suspension lines, guy wires and appropriate infrastructure (DAR p118)
	All wildlife collisions will be reported to responsible authorities (DAR p118)
	Any bridge lighting, including river navigation lighting, will be reduced to the lowest feasible, given safety parameters, and no red lighting is to be used. Wherever possible, lighting should be directed down into the roadway (EC Technical Report p8)
	All garbage will be disposed of in bear-proof containers. All workers will be educated with regards to garbage cleanup, speeding and documenting and reporting incidents/collisions (DAR p118)
	The proponent will engage an environmental consultant to identify all species listed as "sensitive" or "may be at risk" by both COSEWIC and the GNWT, and development of mitigation strategies if any species are found to be potentially impacted. If any vulnerable species are identified, a wildlife survey of all construction areas, with emphasis on pits and quarries, will be undertaken to see if there are any "at risk" animals there. All contractors and sub-contractors will be instructed regarding mitigation measures, including approvals required for disturbance of any nests (Public Hearing p18; p86; p97; DCBC re. SARA, Oct 12, p1)
<b>Noise</b>	
	During the noise intensive construction period, the following mitigation measures will be used: activities limited to non-sensitive time periods (i.e., during peak waterfowl migration times; limiting the extent of heavy equipment operations; and ensuring all equipment is installed with appropriate noise reduction devices (DAR p121)

<b>Component</b>	<b>Commitment</b>
<b>Terrain and Soils</b>	
	Soil erosion will be minimized by using grading to stop run-off erosion; progressive reclamation during operations to reduce slope erosion; seeding the road right-of-way with an erosion controlling plant cover following access road construction; use of diversion berms where necessary; and discontinuation of topsoil stripping during periods of high winds (DAR p 109-10)
	Compacted off-road soils will be deep ripped and cultivated to prepare the surface for re-vegetation. Any ruts will be flattened with a blade prior to topsoil re-vegetation (DAR p110)
	Soil stability at the river crossing to be ensured by controlling surface runoff using berms, dams, or erosion control blankets, and re-establishing vegetation as soon as possible post-construction (DAR p110)
	Along the right-of-way, grading will be avoided as much as possible, disturbed areas will be revegetated as soon as possible, and water breaks installed to interrupt flow paths along ditches on steep slopes (DAR p110)
<b>Vegetation and Plant Communities</b>	
	Disturbances from clearing will be reduced by minimizing right-of-way widths, maximizing construction during winter months, and salvaging and replacing the surface soil to support successful re-vegetation (DAR p110; p126)
	Spoil materials from construction will be laid down in old abandoned pits, rather than in vibrant vegetation areas (DAR p111)
	Dust control measures will be in continuous operation during construction (DAR p126)
<b>Cumulative Effects</b>	
	The proponent commits to an adaptive management approach with regard to potential impacts (short and long term) of the project on migratory birds and species at risk and their habitats. This involves awareness of the wildlife resources potentially at risk, monitoring for unforeseen adverse impacts, and development of appropriate mitigation measures in consultation with Environment Canada and other government departments in the event that adverse impacts occur (EC Technical Report p12)

<b>Component</b>	<b>Commitment</b>
<b>Accidents</b>	
	Will have approved emergency spill action plan and mitigation (e.g., catchment basin at bridge run-off sites) in place (DAR p130)

## Appendix B – Public Registry Index

<b>DEH CHO BRIDGE CORPORATION</b> <i>Mackenzie River Bridge</i> MVEIRB Ref. No. EA-03-008			
Item Number	Description	Originator	Date Received/Sent
1	Preliminary Screening Report and Referral of EA	David Tyson, DFO	6-Jan-04
2	Referral to EA - News Ad		
3	The Bridge to The Future - Globe & Mail Article		14-Jan-04
4	Deh Cho Bridge MOI - Blank Document		15-Nov-02
5	Deh Cho Bridge Act		14-Jan-04
6	News Release INAC-additional funding	INAC	14-Jan-04
7	Edmonton Sun News Item		18-Jan-04
8	Letter to DFO	Andrew Gamble, DCBC	14-Jan-04
9	Deh Cho Bridge Dist list confirmation	EAO, Kimberley Cliffe-Phillips	23-Jan-04
10	Notice of referral to EA-Deh Cho Bridge	EAO, Kimberley Cliffe-Phillips	27-Jan-04
11	Deh Cho Bridge Confirmation re. Distribution List	Various Agencies	Varies
12	Faxcover - Draft Terms of Reference & Workplan	EAO, Kimberley Cliffe-Phillips	4-Feb-04
13	Draft Terms of Reference & Workplan	EAO, Kimberley Cliffe-Phillips	4-Feb-04
14	Northern News article - Bridge construction delayed		9-Jan-04
15	Letter to Chamber of Mines	Andrew Gamble, DCBC	24-Jan-04
16	NWT & Nunavut Chamber of Mines- Letter of Withdrawal	John McConnell, NWT and Nunavut Chamber of Mines	26-Jan-04
17	Letter to Regulators	Andrew Gamble, DCBC	27-Jan-04
18	Letter of Withdrawal	John McConnell, NWT and Nunavut Chamber of Mines	4-Feb-04
19	Faxcover - Additions to PR	EAO, Kimberley Cliffe-Phillips	5-Feb-04
20	Salt River First Nation-distribution list confirmation	Salt River FN-Fort Smith	9-Feb-04
21	Deh Cho Bridge Permitting Process- Volume 1	Deh Cho Bridge Corporation	6-Feb-04

<b>Item Number</b>	<b>Description</b>	<b>Originator</b>	<b>Date Received/Sent</b>
22	Deh Cho Bridge Permitting Process- Volume 2	Deh Cho Bridge Corporation	6-Feb-04
23	Additional info requested by DIAND-SMD re. Deh Cho Bridge Application for Water Licence	Deh Cho Bridge Corporation	11-Feb-04
24	Letter TO MVEIRB	David Tyson, DFO	16-Feb-04
25	CD of additional DCBC Reports	Jivko/Gamble, DCBC	20-Feb-04
26	FAX Transmissions	MVEIRB	
27	Draft TOR comments	Jivko/Gamble, DCBC	9-Feb-04
28	Draft TOR Comments	Andrew Gamble, DCBC	9-Feb-04
29	Distribution form-addition	YK Chamber of Commerce	10-Feb-04
30	Letter to MVEIRB	David Tyson, DFO	16-Feb-04
31	Info submitted by Jivko Engineering	Jivko Jivkov	20-Feb-04
32	Faxcover-Additions to Registry	EAO, Kimberley Cliffe-Phillips	25-Feb-04
33	Draft TOR Comments -EC	Mike Fournier, Environment Canada	25-Feb-04
34	Draft TOR Comments -INAC	Chris Carthew-INAC	25-Feb-04
35	Draft TOR Comments -GNWT	Paul Cobban-RWED	26-Feb-04
36	Faxcover-Additions to registry	EAO, Kimberley Cliffe-Phillips	27-Feb-04
37	Final TOR For Deh Cho Bridge EA	MVEIRB	5-Mar-04
38	Faxcover-Addition to registry	EAO, Kimberley Cliffe-Phillips	17-Mar-04
39	Letter to DCBC RE: DAR	EAO, Kimberley Cliffe-Phillips	17-Mar-04
40	DAR Volume 1 & 2	EAO, Deh Cho Bridge Corp.	13-Apr-04
41	Note to Distribution RE: receipt of DAR	Sherry Sian, MVEIRB	13-Apr-04
42	DAR Submission to MVEIRB (on CD)	DCBC	16-Apr-04
43	DAR Submission to MVEIRB (on CD)	DCBC	16-Apr-04
44	Faxcover-Additions to PR EA03-008	EAO, Kimberley Cliffe-Phillips	21-Apr-04
45	Email to MVEIRB Re: Navigation	Jivko Jivkov, Engineer	21-Apr-04
46	DCBC Letter to Coast Guard	Jivko Jivkov, Engineer	20-Apr-04
47	DCBC Letter Re: NWPA authorization	Jivko Jivkov, Engineer	26-Mar-04
48	NTCL support letter - Deh Cho Bridge Proposal	NTCL	9-Jan-04
49	Brief Project Description DCBC	Jivko Engineering	1-Jan-04
50	DAR Non-Conformity letter to DCBC	Vern Christensen, MVEIRB	21-Apr-04
51	DAR Non-Conformity Table	MVEIRB	21-Apr-04
52	Faxcover-Additions to Public Registry	EAO, Kimberley Cliffe-Phillips	21-Apr-04

<b>Item Number</b>	<b>Description</b>	<b>Originator</b>	<b>Date Received/Sent</b>
53	Steel Prices Soar- CBC Article		10-May-04
54	Revised DAR – Appendix 1	Deh Cho Bridge Corporation	20-May-04
55	Revised DAR cover letter	Deh Cho Bridge Corporation	25-May-04
56	Revised DAR	Deh Cho Bridge Corporation	25-May-04
57	CBC Report Interview with Dave Ramsey MLA Kam Lake		27-May-04
58	DAR Conformity Letter	Vern Christensen, MVEIRB	28-May-04
59	DAR Addendum 1	Andrew Gamble	28-May-04
60	DAR Addendum section C-7	Deh Cho Bridge Corporation	28-May-04
61	Email- RE Board Site Visit	EAO, Kimberley Cliffe-Phillips	2-Jun-04
62	Fax to distribution - Party ID Form	EAO, Kimberley Cliffe-Phillips	7-Jun-04
63	Faxcover-Additions to Public Registry	EAO, Kimberley Cliffe-Phillips	10-Jun-04
64	Board Site visit-notes	EAO, Kimberley Cliffe-Phillips	8-Jun-04
65	DCBC presentation to Board -site visit	Deh Cho Bridge Corporation	10-Jun-04
66	Party Status NWTMN	Chris Heron, NWTMN	11-Jun-04
67	Party Status INAC	Lionel Marcinkoski, INAC	11-Jun-04
68	Party Status Environment Canada	Paula Pacholek, EC	11-Jun-04
69	Party Status DFO	David Tyson, DFO	8-Jun-04
70	Party Status GNWT	Paul Cobban, RWED	9-Jun-04
71	MVEIRB Schedule-Site Visit	EAO, Kimberley Cliffe-Phillips	8-Jun-04
72	MVEIRB to Distribution – Re: party status	EAO, Kimberley Cliffe-Phillips	22-Jun-04
73	MVEIRB Round 1 Information Requests	EAO, Kimberley Cliffe-Phillips	30-Jun-04
74	DCBC Response to Round 1 of EA / IR 1.1.1-1.1.5	Andrew Gamble, DCBC	6-Jul-04
75	Email – New DFO Contact info	David Tyson, DFO	7-Jul-04
76	Faxcover-Response Round 1 IRs	EAO, Kimberley Cliffe-Phillips	7-Jul-04
77	DCBC IR 1.1.4-Revised	Andrew Gamble, DCBC	10-Jul-04
78	INAC Suggested IRs Round 2	David Livingstone, INAC	16-Jul-04
79	Environment Canada Suggested IRs Round 2	Environment Canada	16-Jul-04

<b>Item Number</b>	<b>Description</b>	<b>Originator</b>	<b>Date Received/Sent</b>
80	Email correspondence - DCBC	Andrew Gamble, DCBC	26-Jul-04
81	Email correspondence - DCBC	Andrew Gamble, DCBC	26-Jul-04
82	Round 2 IRs	EAO, Kimberley Cliffe-Phillips	
83	Revised IR (clarification) from Env. Canada	Environment Canada	26-Jul-04
84	Fax transmissions	EAO, Kimberley Cliffe-Phillips	17-Mar-04
85	Email Re: EC contact info.	Paula Pacholek, EC	5-Aug-04
86	MVEIRB to Distribution RE: Hearing Related Dates	EAO, Kimberley Cliffe-Phillips	24-Aug-04
87	Technical Report Guidelines	EAO, Kimberley Cliffe-Phillips	24-Aug-04
88	IRs Round 2-responses	Jivko Jivkov, DCBC	24-Aug-04
89	Correction to dates	EAO, Kimberley Cliffe-Phillips	25-Aug-04
90	Email correspondence	Albert Lafferty, DCBC	25-Aug-04
91	Note to File	EAO, Kimberley Cliffe-Phillips	3-Sep-04
92	Additional IR Response Material	Jivko Jivkov, DCBC	31-Aug-04
93	Email correspondence	EAO/Andrew Gamble	7-Sep-04
94	Email correspondence	EAO/Andrew Gamble	7-Sep-04
95	Hearing Notice-Ft Providence Public Hearing		
96	DCBC Email correspondence	Andrew Gamble, DCBC	7-Sep-04
97	IR 2.1.21 Response	Andrew Gamble, DCBC	7-Sep-04
98	Pre-hearing conference material	EAO, Kimberley Cliffe-Phillips	
99	Env Canada Technical Report	Stephen Harbicht, Env Ca	10-Sep-04
100	INAC Technical Report	Tamara Hamilton, INAC	10-Sep-04
101	PHC Notice		
102	Northern News Article		17-Sep-04
103	DAR Appendix 12-Revised	Andrew Gamble, DCBC	21-Sep-04
104	Environment Canada PHC worksheet	Env Can	24-Sep-04
105	GNWT-RWED PHC worksheet	Paul Cobban, RWED	24-Sep-04
106	Email correspondence	Andrew Gamble, DCBC	29-Sep-04
107	IR 2.1.1 Peer review report	Andrew Gamble, DCBC	30-Sep-04
108	DFO PHC worksheets	Ernest Watson-DFO/YK	1-Oct-04
109	PHC attendance	EAO, Kimberley Cliffe-Phillips	4-Oct-04
110	MVEIRB re: Peer Report	EAO, Kimberley Cliffe-Phillips	8-Oct-04



<b>Item Number</b>	<b>Description</b>	<b>Originator</b>	<b>Date Received/Sent</b>
111	DCBC to DFO	Jivko Jivkov, DCBC	12-Oct-04
112	PHC Notes	EAO, Kimberley Cliffe-Phillips	4-Oct-04
113	DCBC re. SARA	Andrew Gamble, DCBC	12-Oct-04
114	DCBC Hearing Pres'n	Andrew Gamble, DCBC	12-Oct-04
115	GNWT Hearing Presentation	Russell Neudorf, GNWT	12-Oct-04
116	Final Hearing Agenda	EAO, Kimberley Cliffe-Phillips	
117	EC Hearing Pres'n	Env. Canada	
118	PHC Presentation	MVEIRB	
119	Email correspondence	EAO, Kimberley Cliffe-Phillips	29-Sep-04
120	INAC PHC worksheets	Lionel Marcinkoski, INAC	
121	DCBC Pre Hearing Response	Andrew Gamble, DCBC	4-Oct-04
122	DFO Public Hearing Speak notes	Ernest Watson, DFO	14-Oct-04
123	DFO PH Presentation	Ernie Watson, DFO	15-Oct-04
124	Final Hearing Agenda	EAO, Kimberley Cliffe-Phillips	15-Oct-04
125	PHC Notes (Oct 12-04)	EAO, Kimberley Cliffe-Phillips	14-Oct-04
126	INAC correspondence	David Livingstone, INAC	14-Oct-04
127	Email to INAC	EAO, Kimberley Cliffe-Phillips	19-Oct-04
128	Hearing attendance	EAO, Kimberley Cliffe-Phillips	21-Oct-04
129	DCBC Letter to DFO RE: Fisheries Authorization	Jivko Jivkov, DCBC	1-Nov-04
130	Official Hearing transcripts	MVEIRB	21-Oct-04

## Appendix C – MVEIRB Authority to Make Recommendations and Suggestions

Legal consequences flow from the Review Board's determinations. Where the Review Board determines that a significant adverse impact on the environment is likely or that mitigative or remedial measures are required to prevent a significant adverse impact on the environment, it may make recommendations for consideration by the federal and responsible Ministers. This authority is based on section 128 of the *MVRMA* and provisions in the *Gwich'in and Sahtu Dene and Métis Comprehensive Land Claim Agreements*. If the federal and responsible Ministers accept the Review Board's recommendations, "a first nation, local government, regulatory authority or department or agency of the federal or territorial government affected by a decision made under this section shall act in conformity with the decision to the extent of its authority" (*MVRMA*, subsection 130(5)).

During the EA, the Review Board can consider the effects of a development in light of government activities, policies and operations. The Board also considers the development in relation to other developments. Even where significant adverse environmental impacts are not identified, the EA process may result in insights about the development, the development process, or the potential response to the development by government agencies and others. In such instances, the Review Board may make non-binding suggestions to government and other authorities. These suggestions are intended to help government and others affected to encourage a more comprehensive response to the development. Implementation of suggestions is not mandatory even if the federal and responsible Ministers accept this *Report of Environmental Assessment*.

The Review Board's legal authority to make recommendations to mitigate the impacts of the proposed development is based on the *MVRMA* and on the language of subsections 24 and 25, respectively, of the *Gwich'in and Sahtu Dene and Métis Comprehensive Land Claim Agreements*. The Board's interpretation of these authorities is set out below. Subsection 128(1) of the *MVRMA* outlines the Review Board's options upon completion of an EA as follows:

*128. (1) On completing an environmental assessment of a proposal for a development, the Review Board shall,*

*(a) where the development is not likely in its opinion to have any significant adverse impact on the environment or to be a cause of significant public concern, determine that an environmental impact review of the proposal need not be conducted;*

*(b) where the development is likely in its opinion to have a significant adverse impact on the environment,*

- (i) order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c), or*
  - (ii) recommend that the approval of the proposal be made subject to the imposition of such measures as it considers necessary to prevent the significant adverse impact;*
- (c) where the development is likely in its opinion to be a cause of significant public concern, order that an environmental impact review of the proposal be conducted, subject to paragraph 130(1)(c); and*
- (d) where the development is likely in its opinion to cause an adverse impact on the environment so significant that it cannot be justified, recommend that the proposal be rejected without an environmental impact review.*

The Review Board's authority to make recommendations arises in the context of subparagraph 128(1)(b)(ii) of the Act. A reading of paragraph (b) and subparagraph (ii) indicates that the Review Board has the authority to recommend measures to mitigate impacts when the Board has found a significant adverse environmental impact.

The language in these provisions also seems to require that any recommendations made must be directly linked to the finding of a significant adverse environmental impact. A strict interpretation of this paragraph could prevent the Review Board from recommending measures to prevent adverse environmental impacts from becoming significant. In other words, a strict reading of paragraph 128(1)(b) and subparagraph (ii) could arguably indicate that if an adverse environmental impact is not already significant then the Review Board has no authority to recommend measures to reduce or prevent a significant adverse impact (this is called the "restrictive interpretation" below). This result is not consistent with good EA practice.

One of the important benefits of an EA is the opportunity to minimize all identified adverse impacts through the imposition of mitigative measures. Consequently, the Review Board has adopted a more remedial interpretation of 128(1)(b). This interpretation is in keeping with the overall purpose of *MVRMA* and the land claims upon which the Act is based. There is clear authority for such an interpretation of paragraph 128(1)(b) and subparagraph (ii). The Board's reasons are outlined below.

Any measures recommended by the Review Board under paragraph 128(1)(b) are considered by the federal and responsible Ministers under paragraph 130(1)(b) of the *MVRMA*. If the recommended measures are adopted, they must be carried out by responsible Ministers to the extent of their jurisdiction under subsection 130(5) and by the Land and Water Boards under section 62. The EA process is linked to the regulatory process and adopted by the appropriate

decision-makers and must be carried out by regulatory authorities. The result is the “integrated system of land and water management” referred to in the long title of the *MVRMA* and required by the Gwich’in and Sahtu land claims.

The interpretation of paragraph 128(1)(b) will determine whether the Review Board has the authority to recommend measures to mitigate any adverse environmental impacts which might become significant, or only those which have already been determined to be significant. This distinction is important and strikes at the heart of the EA process under the *MVRMA*. If the restrictive interpretation prevailed, the EA process may fail to achieve these statutory goals expressed in section 115 of the *MVRMA*. This section speaks to the need to protect the environment and the social, economic and cultural wellbeing of residents of the Mackenzie Valley. The Review Board’s view is that ignoring evidence of adverse impacts which can be mitigated because the impacts are not yet significant is not consistent with the *MVRMA* or with the Review Board’s duty to protect the environment. The Review Board has considered this issue and has decided that it has the authority to recommend measures to reduce the effect of a significant adverse environmental impact below the level of significance and measures to prevent an adverse environmental impact from becoming significant.

The authority for this interpretation is based in section 24.3.5 (a) of the *Gwich’in Comprehensive Land Claim Agreement* and in section 25.3.5 (a) of the *Sahtu Dene and Metis Comprehensive Land Claim Agreement*. These sections are identical so the relevant portion of Sahtu claim only is reflected below:

*25.3.5 (a) subject to 25.3.3(a), a development proposal shall be assessed by the Review Board in order to determine whether the proposed development will be likely to have a significant adverse impact on the environment or will likely be a cause of significant public concern. In making its determination the Review Board may consider terms and conditions to the proposed development which would prevent significant adverse impact on the environment and may recommend the imposition of such terms and conditions to the Minister. Such terms and conditions shall be subject to review pursuant to 25.3.14.*

This provision clearly intended that the Review Board be able to recommend terms and conditions (measures) to the Minister to “prevent significant adverse impact on the environment”. This authority goes beyond the restrictive interpretation of paragraph 128(1)(b) discussed above. It does not require that an impact already be determined to be significant before the Review Board can recommend measures. Instead the Review Board can recommend measures to prevent an impact which is not yet significant from becoming so.

In this regard, the restrictive interpretation of paragraph 128(1)(b) of the *MVRMA* is not consistent with these paragraphs of the Gwich’in and Sahtu land claims.

The Review Board is therefore of the view that the interpretation of paragraph 128(1) (b) should be more liberal in order to make it consistent with the land claims and with section 115 of the *MVRMA* as well.

Section 3.1.18 of the Sahtu Land Claim (3.1.19 of the Gwich'in claim) specifies that the Agreement may be used as an aid to interpretation where there is any doubt in respect of any legislation implementing the provisions of the Agreement. Section 3.1.22 of the Sahtu land claim (3.1.23 of the Gwich'in) and part 5 of the *MVRMA* specify that when there is an inconsistency or conflict between any law and a land claim agreement that the land claim agreement applies to the extent of the inconsistency or conflict. This legal hierarchy is clear. The land claim provisions are paramount. Consequently, the Review Board has the authority to recommend measures both to reduce significant adverse environmental impacts below the level of significance and to prevent adverse environmental impacts from becoming significant. This finding is in keeping with good EA practice and is consistent with both the Gwich'in and Sahtu land claims.

## **References**

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