

Environment 311

**Description of the Regulatory Regime
and
Environmental Impact Assessment Process
for an
Extension of the Mackenzie Valley Highway**

Draft

March 1999

*Review by
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Executive Summary

The Department of Transportation is currently considering developing an extension of the Mackenzie Highway north from Wrigley to the Dempster Highway. The attached document identifies the relevant regulatory regime and environmental impact assessment process for this extension, and describes the requirements of the process. It also provides advice to the Department of Transportation on how to conduct an effective and efficient environmental assessment.

The environmental impact assessment (EIA) of the highway extension, were it proposed, would be conducted under the new Mackenzie Valley Resource Management Act (MVRMA). There are three separate parts to the MVRMA assessment process:

Preliminary screening is the most basic ~~EIA~~ ^{not an EIA} that a development can go through. It will be triggered by permit applications and conducted by the Sahtu and Gwich'in Land and Water Boards, or if Part IV of the MVRMA is promulgated, the Mackenzie Valley Land and Water Board, and the federal and territorial permitting authorities. Based on information provided by the Department of Transportation, these screening authorities will 1) verify that the proposal is not in conflict with land use plans, and 2) will decide if the highway extension might cause significant adverse environmental effects or public concern. If so, they will be required to refer the highway extension to the Mackenzie Valley Environmental Impact Review Board (MVEIRB). It is very likely that screening authorities will make this referral.

The MVEIRB will conduct an **environmental assessment** if the highway extension is referred to it by preliminary screeners, or if the MVEIRB decides to conduct an environmental assessment on its own motion. ^{explain} The MVEIRB will consider impacts and their significance, mitigation measures, public comments, and anything else it considers relevant. It will decide whether or not an environmental impact review is necessary, if the highway may be developed (with or without mitigation measures) or if the proposal should be rejected.

The outcome of the environmental assessment will depend largely on how well the Department of Transportation prepares its environmental assessment report, if the extension causes significant public concern, and whether the likely residual environmental and socio-economic effects of the fully mitigated development are considered by the MVEIRB to be acceptable. It would be in the Department of Transportation's best interests to 1) focus the environmental assessment report on the key issues and assess them as well as possible, 2) have the design of the highway reflect the issues identified, and 3) focus on identifying effective mitigation and remediation measures to deal with significant adverse impacts where those impacts cannot be avoided by design. The DOT should also demonstrate that they have carried out public consultation and incorporated information received into the design and mitigation measures of the extension.

The Department of Transportation would be wise to include in the environmental assessment report any information relevant to the MVEIRB decision, and to compile and submit the report during preliminary screening. This will speed up screening, and might satisfy screeners that a referral to the MVEIRB is not required, if the extension is well planned with all necessary mitigation measures.

If the MVEIRB decides that an **environmental impact review** is necessary, it will be conducted by a panel appointed by the MVEIRB. The panel may include both MVEIRB members and technical experts, and would include at least two members of the MVEIRB that have been nominated by First Nations. This panel will consider the issues that are outstanding from previous assessment, and may request that the Department of Transportation produce an Environmental Impact Statement, unless the previous environmental assessment report is equivalent to one. In addition to considering impacts and their significance, mitigation measures, and public comments, the environmental impact review will consider the purpose of the extension, alternative means, follow-up, and sustainability of the development. The review panel will recommend the approval of the highway extension or reject

the proposal. This will depend on if the review panel is satisfied that the extension will not cause unacceptable significant adverse environmental impacts and will not harm the social, cultural and economic well being of residents and communities in the Mackenzie Valley.

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Glossary

The environmental impact assessment process of the Mackenzie Valley Resource Management Act is a distinct process, and the Act uses terminology in a distinct way. This glossary is intended to avoid confusion, by clarifying the meaning of terms commonly used in one way in the Act but used with different meanings elsewhere. This glossary will also expand on the few acronyms used in this document.

Mackenzie Valley:	The Northwest Territories, excluding the Inuvialuit Settlement Area and Wood Buffalo National Park
MVRMA:	The Mackenzie Valley Resources Management Act, a new piece of legislation that includes an environmental impact assessment process for the Mackenzie Valley
MVEIRB:	The Mackenzie Valley Environmental Impact Review Board, responsible under the Mackenzie Valley Resources Management Act for all environmental impact assessment following preliminary screening
Preliminary screening:	The first stage of the environmental impact assessment process of the MVRMA (usually conducted by permitting authorities)
Environmental Assessment:	The second stage of the environmental impact assessment process of the MVRMA.
Environmental Impact Review:	The third stage of the environmental impact assessment process of the MVRMA. <i>what does it include - e.g. who on panel, what review @ this stg.</i>
Environmental Impact Review Panel:	A panel appointed by the MVEIRB to conduct environmental impact reviews
Mackenzie Valley Land and Water Board	Regulatory authority dealing with land and water permits in the unsettled claim area and wherever there is a transboundary development.
Gwich'in and Sahtu Land and Water Boards	Regulatory authorities dealing with land and water permits in the Gwich'in and Sahtu Settlement Areas
Mitigation and Remediation Measures	Measures that reduce or eliminate adverse impacts, or restorative measures that repair adversely affected components

1 Introduction

The Department of Transportation is currently considering developing an extension of the Mackenzie Highway north from Wrigley to the Dempster Highway (see Map 1). This document is intended to clarify what the likely regulatory regime and environmental impact assessment process for this extension would be if the Department of Transportation were to propose it.

This document will:

- illustrate the regulatory authorizations required for the construction of the extension;
- identify the relevant regulatory impact assessment regime and describe its current state;
- describe the relevant environmental impact assessment processes within the regime;
- predict the likely course of an environmental impact process for the extension;
- identify the relevant environmental assessment requirements; and,
- advise the Department of Transportation on how to conduct a good assessment that avoids unnecessary process delays.

permits
req'd?



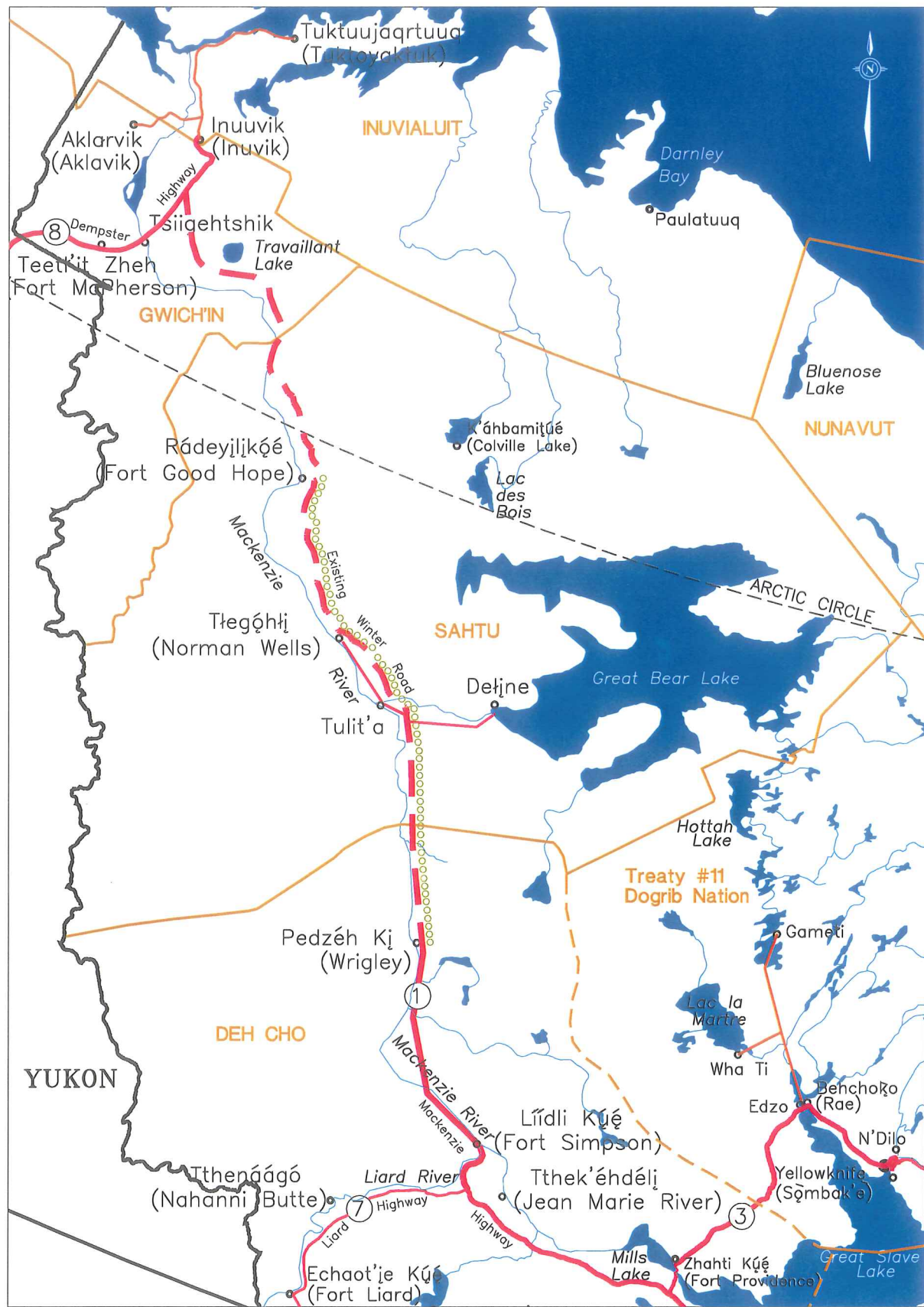
2 Regulatory Regime

If the Mackenzie Valley Highway extension is proposed, a number of permits, licences or other authorizations will be required during construction and maintenance of the road. There is also the possibility, depending on the type and nature of the research, that field studies conducted to provide baseline information for an environmental assessment impact statement would also require specific permits (in particular, scientific research permits under the NWT Scientists Act, Wildlife Act, and Northwest Territories Act). For the purposes of this report, the authorizations required for the construction phase of the Mackenzie Valley Highway extension are the focus, as this is the period with the most intense activity.

In order to review the regulatory regime for the extension of the Mackenzie Valley Highway, a number of assumptions have been made about the nature of the construction activities required, in order to determine the authorizations that are necessary. It is assumed these activities will include:

- blasting
- quarrying
- use of heavy equipment
- establishment of construction camps
- building bridges

The Mackenzie Valley Resource Management Act will apply to this development. Currently Part IV of the MVRMA, concerning the Mackenzie Valley Land and Water Board, has not been promulgated. This review of the regulatory regime is written, however, under the assumption that the entire Act will be promulgated if and when the DOT decides to proceed with the extension of the highway.



LEGEND

- EXISTING ALL WEATHER ROAD
- - - WINTER ROAD
- ... PROPOSED ALL WEATHER ROAD

0 50 100 150 200km

DIGITAL MAP OF NORTHWEST TERRITORIES FROM:
SELECTED MINERAL DEPOSITS OF THE NORTHWEST TERRITORIES,
DEPARTMENT OF ENERGY, MINES AND RESOURCES, MINERAL
INITIATIVES 1991 TO 1995, REVISED OCTOBER, 1996.
INFORMATION MANAGEMENT GROUP, DIAND (Sept. 5/1997)

CONCEPT FOR AN ALL WEATHER HIGHWAY EXTENSION FOR THE MACKENZIE VALLEY

The Preliminary Screening Requirement Regulations of the MVRMA detail the federal and territorial acts and regulations that will trigger preliminary screening under the Act. These regulations will provide some guidance to the authorizations required and should be consulted prior to development. Further guidance can be found through a document prepared by the Mackenzie Valley Land and Water Board Working Group, currently in draft form, titled *Authorizations Generally Required to Develop a Project in the Mackenzie Valley*.

Very often, for many developments in the NWT, application for a water licence or a land use permit are the first authorizations that the proponent applies for in the regulatory process that will trigger environmental impact assessment. They are, however, only two of several authorizations that may be required and that will trigger preliminary screening. The water license and land use permits, as well as some of the other authorizations that will likely be required, are described in the following sections.

Depending on where construction activities take place and when they occur, more than one of each of the authorizations described below may be required. For instance, a single land use permit may be adequate for all construction camps, if these are located in relatively close proximity and will be used simultaneously over only two seasons. These are decisions that will have to be made by regulators once the DOT decides on the construction approach.

2.1 Acts and Regulations for the Aquatic Environment

2.1.1 WATER LICENSE UNDER THE NORTHWEST TERRITORIES WATERS ACT

For the use of water and discharge of wastes, one or more water licenses will be required under the Northwest Territories Waters Act. If the activities and impact are within the Sahtu and Gwich'in regions, application is made to the respective land and water boards. In areas of unsettled land claims or if the effects of the activity are in more than one region, application is made to the Mackenzie Valley Land and Water Board (until Part IV of the MVRMA is promulgated, application would be made to the NWT Water Board). A water license typically contains guidelines developed for both the protection of aquatic life and the protection of humans consuming water.

For drinking water the Guidelines for Canadian Drinking Water (published by Health Canada) are the criteria required under the Public Health Act. Aquatic life is protected through the Canadian Water Quality Guidelines for the protection of aquatic life. The land and water boards may also require the proponent implement an Aquatic Effects Monitoring Program (AEMP) designed to monitor, evaluate and manage the effects of the project on aquatic life.

Abandonment and restoration issues are often conditions of water licenses in the NWT. Guidelines on Abandonment and Restoration are available from DIAND.

Bridge crossings are also regulated under the water license.

2.1.2 AUTHORIZATION UNDER THE FISHERIES ACT

Under the Fisheries Act and the federal Department of Fisheries and Oceans' (DFO) *Policy for the Management of Fish Habitat*, DFO strives to achieve conservation by ensuring that the current productive capacity of existing habitat is maintained by applying the guiding principle of no net loss. Under this policy, unavoidable habitat alterations are balanced by development of new habitat. One or more authorizations will be required under the Fisheries Act to comply with the habitat protection provisions. Measures to compensate for the habitat that would be altered become conditions of the authorization issued to the proponent. The proponent is responsible for identifying the habitats potentially affected by the project, assessing the potential for each fish species of concern and developing mitigation alternatives in the form of a habitat compensation plan, which is reviewed and approved through negotiations with DFO.

DFO has also set guidelines for the protection of fish from exposure to shock waves induced by the use of explosives. If blasting occurs near water, and these guidelines may be exceeded, the proponent must apply for an authorization under the Fisheries Act for the use of explosives.

2.1.3 APPROVAL UNDER THE NAVIGABLE WATERS WORKS REGULATIONS (NAVIGABLE WATERS PROTECTION ACT)

The Canadian Coast Guard, under DFO, is the agency responsible for enforcing the Navigable Waters Works Regulations. Under these regulations, an approval must be obtained for the placement of structures or works such as bridges, dams or causeways that substantially interfere with navigation or for any work conducted in, on, over or under any navigable water.

2.2 Acts and Regulations for the Terrestrial Environment

2.2.1 LAND USE PERMIT UNDER THE MACKENZIE VALLEY LAND USE REGULATIONS (MVRMA)

Currently, the MVRMA provides for the Sahtu and Gwich'in Land and Water Boards and gives them jurisdiction for all uses of land for which a permit is required under the regulations. Application for land use permits are made to each of these boards when a use of land is to take place, and is likely to have an impact, within the respective settlement areas. Once Part IV of MVRMA is promulgated, if the activity or the effects are outside of these regions or extend across more than one region, the Mackenzie Valley Land and Water Board receives the application. The Mackenzie Valley Land Use Regulations outline the types of permit and the activities they encompass, and also specify the types of conditions that may be attached to the permit. Type A permits apply to larger operations, while Type B permits are issued for smaller operations.

Until Part IV of MVRMA is promulgated, in areas of unsettled claims, the *Territorial Lands Act* and Territorial Land Use Regulations are still in force. Short-term (two years or less) land use permits to conduct activities on Crown Land are administered by DIAND. The Regulations outline the types of permit and the activities they encompass. All activities

related to land use are included under a single permit, to which operating conditions are usually attached. Class A permits cover larger operations, while Class B permits are issued for smaller operations

DIAND produces guidelines (commonly known as “blue books”) for various land use activities:

- *Reclamation Guidelines for Northern Canada* assist contractors and operators with erosion control and land restoration
- *Environmental Guidelines: Access Roads and Trails* provide land use guidelines for planning, development, operation and abandonment of access road and trails in the NWT.

2.2.2 QUARRY PERMIT UNDER THE TERRITORIAL QUARRYING REGULATIONS (TERRITORIAL LANDS ACT) AND THE MACKENZIE VALLEY LAND USE REGULATIONS (MVRMA)

Under the Territorial Quarrying Regulations (Territorial Lands Act) a quarry permit is required to use construction material from a pit or quarry on Crown land. Application is made through DIAND who also issues the permit. The permit authorizes the extraction of a particular volume of material. Pit or quarry operations also require a land use permit to conduct the quarrying operations (see section 2.2.1). DIAND produces a “blue book” titled *Environmental Guidelines: Pits and Quarries* as a guide to developing and operating pits and quarries.

On Sahtu or Gwich’in owned lands, application for construction material is made to the respective land and water boards. The MVRMA requires the Gwich’in and Sahtu First Nations supply and permit access to construction material to federal or territorial government departments when an alternate source is not available in the surrounding area. The Gwich’in and Sahtu First Nations are entitled to compensation for construction materials obtained from their lands. The Mackenzie Valley Land Use Regulations also require a land use permit to conduct quarrying operations.

2.2.3 COMMISSIONER’S LAND ACT AND REGULATIONS

On Commissioner’s lands, permits for land use are issued through the GNWT’s department of Municipal and Community Affairs (need to find out more from Andy Tereposky – Lands Manager).

2.2.4 PERMIT UNDER THE EXPLOSIVES ACT

Natural Resources Canada administers the Explosives Act. Under the Explosives Act permits are required for temporary blasting, manufacture of explosives, overnight storage of explosives or daily use storage at a work site.

2.3 Acts and Regulations for Cultural Resources

2.3.1 PERMIT UNDER THE NORTHWEST TERRITORIES ARCHAEOLOGICAL SITES REGULATIONS (NORTHWEST TERRITORIES ACT)

Studies in archaeology require an Archaeologists permit. Administered through the Prince of Wales Northern Heritage Centre, the Northwest Territories Archaeological Sites Regulations govern the issuance of permits to conduct archaeological studies; these are mandatory for all archaeological investigations either for research purposes or in conjunction with developments.

2.3.2 TERMS AND CONDITIONS OF LAND USE PERMITS UNDER THE MACKENZIE VALLEY LAND USE REGULATIONS (MVRMA) OR TERRITORIAL LAND USE REGULATIONS (TERRITORIAL LANDS ACT)

Within the Sahtu and Gwich'in settlement regions of the Mackenzie Valley, and in unsettled regions once Part IV of MVRMA is promulgated, the Mackenzie Valley Land Use Regulations provide for the protection of known archaeological sites and provide a course of action to be taken if a site is discovered during operations. These are often part of the terms and conditions of land use permits.

Until Part IV is promulgated, outside of settlement regions, on Crown land, the Territorial Land Use Regulations provide for the protection of known archaeological sites, outline a course of action to be taken if a site is discovered during operations, and are often part of the terms and conditions of land use permits.

3 The MVRMA Assessment Regime

If an extension is proposed by the Department of Transportation, the environmental impact assessment for it would be conducted under the new Mackenzie Valley Resource Management Act (MVRMA). This is the overarching piece of legislation that will determine the environmental assessment process for this development. The MVRMA specifies authorities and responsibilities for environmental assessment throughout the Mackenzie Valley, establishes the Mackenzie Valley Environmental Impact Review Board (MVEIRB) as the agency responsible for environmental assessment and review, establishes the Sahtu and Gwich'in Land and Water Boards as authorities within their respective regions, and establishes the Mackenzie Valley Land and Water Board.

The assessment process under the new regime will be different from the previous one in several important ways, including both what it will look at and how it will look at it. This will be described step by step.

The Canadian Environmental Assessment Act will not be the overarching piece of environmental impact assessment legislation applied to the extension. According to Section 116 of the MVRMA, the Canadian Environmental Assessment Act (CEAA) no longer applies to the Mackenzie Valley except for under very specific circumstances (unless the assessment is referred to the Canadian Environmental Assessment Agency by the federal

minister after considering the Review Board's report, or under certain transboundary panel conditions).

The MVRMA is not entirely promulgated at the present time. The sections empowering the Review Board and the Sahtu and Gwich'in Land and Water Boards are promulgated, but the section empowering the Mackenzie Valley Land and Water Board is not yet promulgated. At present, the agency that will become the Mackenzie Valley Land and Water Board is not yet a board, but a working group. As will be described in more detail below, this has some affect on the preliminary screening stage of the process, but not on the environmental assessment or environmental impact review stages of the environmental impact assessment process.

This description of the environmental impact assessment process will explain considerations that are relevant until the Act is fully promulgated, but will focus primarily on the process that will be relevant after it is fully promulgated. There are two reasons for this. First, the part of the Act that is not yet promulgated does not make a significant difference to the later stages of assessment, and as this document will describe, these are likely to be the most important stages of the process for the highway extension. Second, the section that has not yet been promulgated most likely soon will be and it is quite unlikely that the extension will be proposed before then.

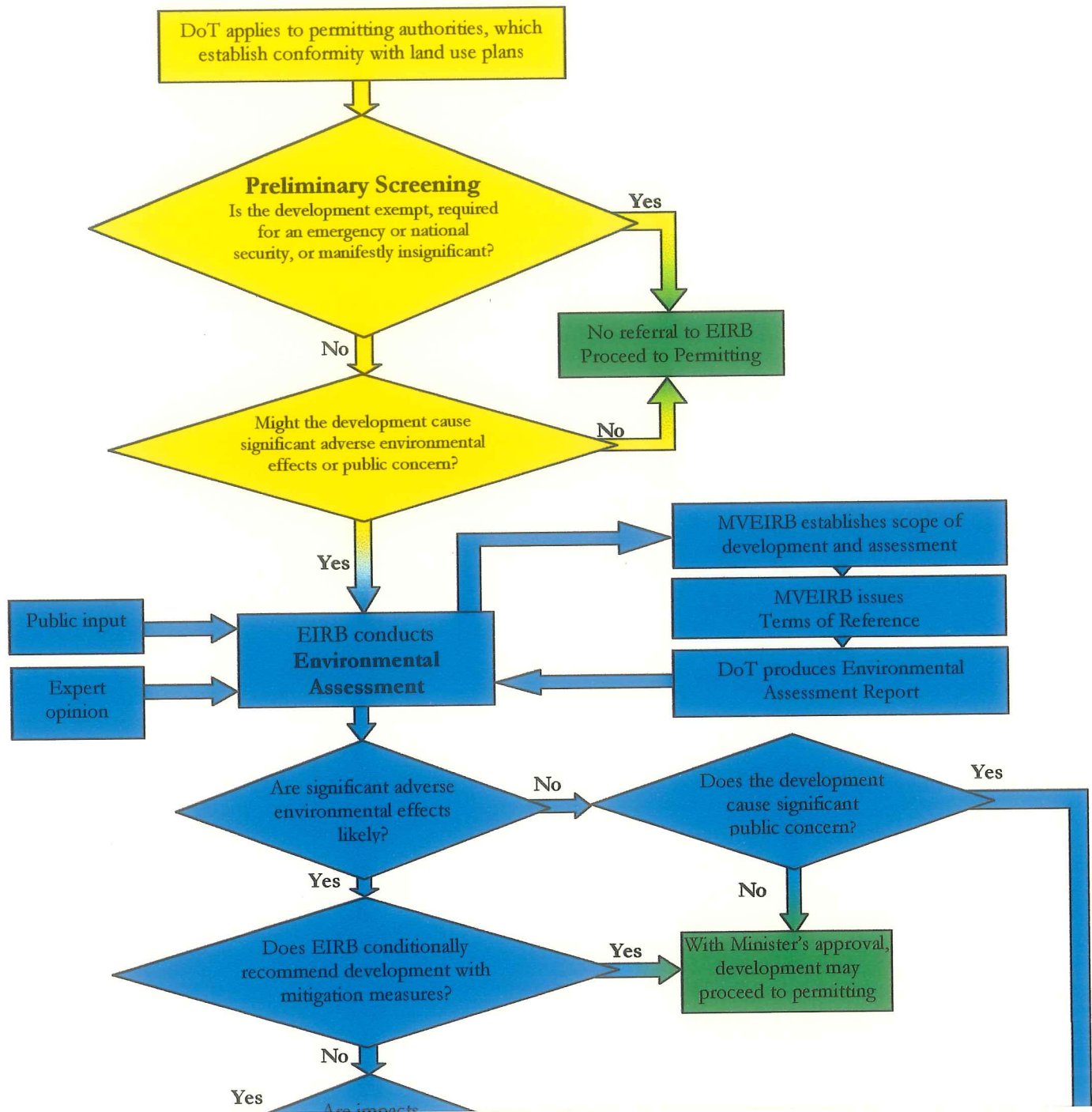
3.1 The Overall Process

There are three separate parts to the environmental impact assessment process under the MVRMA. These are, in the order that they occur, 1) preliminary screening, 2) environmental assessment, and 3) environmental impact review. Different bodies bear different responsibilities during the different stages. These stages are progressive, depending on the decisions made during the assessment process (see Figure 1). An environmental impact review can only follow an environmental assessment, which in general can only follow preliminary screening. Each stage is built on the previous one, takes into consideration the information from the previous stage, and deals with issues not resolved by the previous stage. For this reasons, the range of considerations diminishes at each stage.

3.2 Most Likely EIA Process Scenario

This document will focus on the EIA process that the highway extension is most likely to follow if proposed. *The actual course of the EIA will depend on decisions made at different stages by regulators and boards during the assessment process.* Where there are uncertainties in the process, this document will describe the basis for decisions that will influence the course of the EIA and will describe the likelihood of different EIA scenarios. This will be based on what is currently known about the development, the requirements of the Act, regulations, and guidelines, and key informant interviews held with the responsible authorities.

4 Preliminary Screening



Preliminary screening is the most basic part of the EIA process. No federal or territorial body can issue any authorization (such as a license or permit) without following the environmental impact assessment process required by Part Five of the MVRMA (s.118(1)). When the Department of Transportation applies to authorities for the necessary permits, those authorities will, according to section 124 of the Act, conduct preliminary screening. **Preliminary Screening determines the need for an environmental assessment.**

It is a certainty that the extension will undergo preliminary screening, as required by Section 124 of the MVRMA, for a number of reasons. The extension would not be an exempt development according to the MVEIRB Exemption Regulation. It satisfies the legal definition of a development under the MVRMA, which defines development as “any undertaking, or any part of an undertaking, that is carried out on land or water and... wholly within the Mackenzie Valley...” (s.111). Also, if proposed, the extension of the Mackenzie Highway will involve many activities that require permits and authorizations. Since the MVRMA (s.124) requires preliminary screening of non-exempted developments that need permits, it is certain that the highway extension will undergo screening if proposed.

4.1 Groups Conducting Preliminary Screening

Two groups of permitting authorities are responsible for conducting preliminary screening. These are the land and water boards and government authorities (both Federal and Territorial). This section will now briefly describe the involvement of different bodies, and their likely roles in the screening of the Mackenzie Highway extension.

4.1.1 SCREENING BY THE MACKENZIE VALLEY LAND AND WATER BOARD

The Mackenzie Valley Land and Water Board is created by the MVRMA to serve as the permitting authority for developments that occur within the Mackenzie Valley but not entirely within any one settlement area. For these developments, the Mackenzie Valley Land and Water Board is responsible for conducting preliminary screening or coordinating preliminary screening among the permitting authorities. Since the part of the MVRMA that creates and empowers the Mackenzie Valley Land and Water Board has not yet been promulgated, this Board does not exist yet, but there is a working group poised to become the Board. By the time the extension is proposed, the Mackenzie Valley Land and Water Board will likely conduct a preliminary screening, or coordinate other permitting authorities in conducting their preliminary screenings.

4.1.2 SCREENING BY FEDERAL AND TERRITORIAL AUTHORITIES

The following list indicates the federal and territorial authorities that will most likely be involved in preliminary screening.

- Dept. of Fisheries and Oceans (Canada)
- Dept. of Fisheries and Oceans, Coast Guard (Canada)
- Indian and Northern Affairs Canada
- Environment Canada
- Natural Resources Canada
- Resources, Wildlife and Economic Development (GNWT)
- Health and Social Services (GNWT)
- Municipal and Community Affairs (GNWT)

Each of these authorities has its own legislation regulating the development of the extension. After the Mackenzie Valley Land and Water Board is officially created, it will assume the responsibility for issuing land use and water permits. Until that time, DIAND and the NWT Water Board will continue to issue land use permits and water licences, respectively, for Crown land outside the settlement regions and other permitting authorities will continue to have preliminary screening responsibilities for the legislation they are responsible for (see section 2).

4.1.3 PRELIMINARY SCREENING IN SETTLEMENT AREAS

The MVRMA creates the Sahtu and Gwich'in Land and Water Boards, and (once Part IV is promulgated) the Mackenzie Valley Land and Water Board, which have jurisdiction for issuing all land and water permits. Since the route of the highway includes lands in the Sahtu and Gwich'in settlement regions, as well as in areas or unsettled land claims the Mackenzie Valley Land and Water Board will issue these permits.

In settlement areas, any other authorities that give permits regarding the use of land and water and the deposit of waste must consult the regional Land and Water Board, which cannot issue a permit until the EIA requirements have been met (MVRMA sec.52(2), sec.62). An application for a permit will invoke a requirement to conduct preliminary screening (MVRMA sec.124(1)).

The Gwich'in and Sahtu Land and Water Boards will require the consent of land owners. In the Sahtu Settlement Area, land ownership is decentralized to district and community levels. The Sahtu Land and Water Board will require permission from the three district land corporations responsible for land ownership, these being the Deline Land Corporation, the Tulita District Land Corporation and the K'ahsho Got'ine Lands Corporation. These three district land corporations will consult with community based land corporations for their consent. In the Gwich'in Settlement Area, the Gwich'in Tribal Council is the one land owning body, and it has established the Gwich'in Land Administration. The Gwich'in Land and Water Board will require the consent of the Gwich'in Land Administration before issuing permits.

4.1.4 INTERRELATIONSHIPS OF PRELIMINARY SCREENERS

Under the current regime, preliminary screening may be done independently by each permitting authority. According to the MVRMA (sec.124(3)), in a case such as this where more than one body is required to screen, "any of them may consult the others, adopt another's report or participate in a joint preliminary screening", and, if a Land and Water Board is involved, "the others are not required to conduct a preliminary screening". Once Part Four of the MVRMA is promulgated, the Mackenzie Valley Land and Water Board will conduct preliminary screening. The other authorities will therefore not be required to conduct their own screenings. They may choose to do so, but it is unlikely that they will if the Mackenzie Valley Land and Water Board duly considers their concerns in the preliminary screening. The other authorities may adopt the screening done by the Mackenzie Valley Land and Water Board.

The information provided by the Department of Transportation during screening should reflect the factors to be considered in screening. These are described in the MVEIRB document entitled “Environmental Impact Assessment in the Mackenzie Valley: Interim Guidelines”. Section x further describes the type of information required during an environmental impact assessment.

In many cases, the level of detail in the information provided by the proponent at the preliminary screening stage is less than it is if the environmental impact assessment moves to more rigorous levels of examination (environmental assessment or environmental impact review). It is, however, recommended that the Department of Transportation consider submitting a thorough environmental assessment report at the preliminary screening stage. For reasons explained in section 5.3, this will facilitate the entire environmental impact assessment process. There is a risk that once the highway extension is referred to MVEIRB for environmental assessment, the Review Board will not accept the Department’s report as adequate and will produce a terms of reference for the Department to produce a different report. Consulting with the staff of the MVEIRB at an early stage about the requirements of the report can substantially mitigate this risk. It will be beneficial to the Department, in terms of planning for the work and studies that may need to be done for an environmental assessment report, as well as in the content of the report itself. In addition, consultation with residents in the regions of the highway extension will help focus the report on important issues; this community consultation is something MVEIRB will be looking for in any submission made by the Department.

4.2 Conformity with Land Use Plans

At the present time, the Gwich’in Land Use Planning Board (established under Article 24.2 of the Gwich’in Comprehensive Land Claim Agreement) and the Sahtu Land Use Planning Board (established under Article 25.2 of the Sahtu Dene and Metis Comprehensive Land Claim Agreement) are preparing land use plans for both settlement areas through which the route of the extension passes. Under Article 46 of MVRMA, any authority issuing a permit relating to the use of land or waters or the deposit of waste, must do so in accordance with the applicable land use plans. Generally, the permitting authority refers the activity to the land use planning board and the board determines whether an activity is in accordance with a land use plan. This must be done before a permit is issued. If these plans have not yet been completed, the authority conducting screening may wish to check with the same Boards to confirm that the proposed development fits into current planning.

Before applying for permits, it would be wise for the Department of Transportation to consult with Planning Boards to determine how well the highway extension conforms to land use planning

4.3 The Preliminary Screening Test and Decision

The preliminary screening authorities are required by the MVRMA to screen the application. In doing so, the authority must answer the following question (s.125(1)(a)): Might the extension cause significant adverse environmental effects and/or cause public concern? This is different from asking “*will* it cause significant environmental effects” or “is it *likely* to

cause significant environmental effects”. This is a more rigorous test than that used in the Canadian Environmental Assessment Act processes.

This decision will be made based on the information provided about the development, and on the preliminary screener’s knowledge of the existing conditions. Preliminary screeners have the option of holding public hearings, but are not required to. If the screener is a Land and Water Board (as it probably will be), it is empowered to require all government bodies to and produce any documents or information in their possession that it feels could be helpful to its determination.

If the preliminary screening bodies decide during their screening that the extension might cause significant adverse environmental effects or public concern then they are obligated to submit the development to the MVEIRB for environmental assessment. If one or more of the above authorities submits the development to the Review Board, it will conduct an Environmental Assessment. It does not matter whether the application is referred by only one or by all of the screening bodies. It would only take one referral to the MVEIRB from any screening body to trigger an environmental assessment.

Preliminary screeners will write a report containing the reasons for their screening decisions. This report will go to the MVEIRB, the Department of Transportation, any other preliminary screeners and regulators. It will also be publicly available.

Regardless of the results of screening, the MVEIRB is able to conduct an Environmental Assessment on its own motion due to issues of special environmental concern, according to Section 126 of the MVRMA. This means that if no preliminary screening body refers the development to the Review Board, and the Review Board feels that an environmental assessment is nonetheless appropriate, it will conduct an environmental assessment.

Much of the information that the Department of Transportation would be expected to compile for an environmental assessment would be helpful during preliminary screening. As described below, it would also be to the Department of Transportation’s advantage to have this information ready at the screening stage (see below, under section 5.3).

4.4 Likely Outcome of Preliminary Screening

It is likely that the agency or authorities doing the preliminary screening of the highway extension will find that it might cause a significant adverse environmental or socio-economic effect. There are a number of reasons to believe that it might, including the scale of the development, the many stream crossings involved, the social importance of wildlife in the area, and so on. These considerations do not mean that the extension **will** cause a significant adverse environmental effect, but only that **the possibility exists**. It is also possible that there might be public concern over the extension.

5 Environmental Assessment

The second stage of the EIA process of the MVRMA is called an environmental assessment. It will be conducted by the MVEIRB if preliminary screeners refer the highway extension to it, or if the MVEIRB decides to conduct an environmental assessment on its own motion. An environmental assessment is more rigorous than preliminary screening, and will be based in part on an environmental assessment report, which will include the information submitted in the development proposal prepared in application for permits, on the preliminary screening report, and on other information.

No authorities are permitted to do anything to irrevocably further the development until the environmental assessment is completed.

5.1 Jurisdiction and Transboundary Considerations

The entire highway extension and its effects will occur in Gwich'in and Sahtu settlement areas, as well as in non-settlement areas, and because of transboundary considerations, will thus involve the participation of the Mackenzie Valley Land and Water Board. Otherwise, this will not influence the process *as a transboundary consideration* during the MVEIRB's environmental assessment. Although the Gwich'in and Sahtu Settlement Areas are distinct regions, they are both under the jurisdiction of the MVRMA. The number of members of MVEIRB appointed by these First Nations is defined by Section 112 of the Act, and is predefined, irrespective of the fact that the Mackenzie Highway extension will involve both Gwich'in and Sahtu settlement areas.

There is no provision in the MVRMA for environmental assessments to occur jointly with jurisdictions outside of the Mackenzie Valley. Under s.128(4), *on completion of the environmental assessment*, the MVEIRB's report shall identify any area outside the Mackenzie Valley in which the development is likely to have a significant adverse impact or to be a cause of significant public concern and specify to the extent to which that area is affected. If this is the case, it may enter into a joint panel or examination (MVRMA s.140(2)), as described in section 6.2.

There is, however, a provision for co-operation with other jurisdictions. The MVEIRB, if they find during the environmental assessment that the development might have a significant adverse impact on the environment in a region outside the Mackenzie Valley, must advise the authority responsible for EIA in that region and request its co-operation in the conduct of the assessment (s.140(1)). There is no set process for how this co-operation should take place; presumably it would be negotiated between the MVEIRB and the EIA authority of the other region.

5.2 Considerations of the MVEIRB

In conducting an Environmental Assessment, the MVEIRB will review the development in order to make recommendations that would support a wise decision about the development. The MVRMA obligates the Review Board to conduct environmental assessments "in a

timely and expeditious manner" (s.115). It is also required to have regard to "the protection of the environment from the significant adverse impacts of proposed developments" (s.115a) and "the protection of the social, cultural and economic well-being of residents and communities in the Mackenzie Valley"(s.114b). This applies to all processes of the MVEIRB.

When conducting an environmental assessment, in addition to the above factors, the MVEIRB is required, at a minimum, to consider the following (as stated in MVRMA s.117 (2)):

- (a) the impact of the development on the environment, including the impact of malfunctions or accidents that may occur in connection with the development and any cumulative impact that is likely to result from the development in combination with other developments;*
- (b) the significance of any such impact;*
- (c) any comments submitted by members of the public in accordance with the regulations or the rules of practice of the Review Board;*
- (d) where the development is likely to have a significant adverse impact on the environment, the imposition of mitigative or remedial measures; and,*
- (e) any other matter, such as the need for the development and any available alternatives to it, that the Review Board or any responsible minister, after consulting with the Review Board, determines to be relevant.*

The MVEIRB will make its decision based on the report from the preliminary screening, an environmental assessment report from the developer, public input, and any other information the Board deems relevant to the Environmental Assessment. The MVEIRB may also call up experts at its discretion.

5.3 The Environmental Assessment Report

The outcome that is eventually reached will depend, in part, on the Environmental Assessment Report submitted by the Department of Transportation. The Environmental Assessment Report is an excellent opportunity for the Department of Transportation to provide relevant information to the MVEIRB. It will be the Department of Transportation's legal (and financial) responsibility to conduct the relevant studies and to produce and distribute the environmental assessment report.

Once an environmental assessment is begun, the MVEIRB makes a decision on the scope of the information required and sets terms of reference for the Department of Transportation's environmental assessment report. The Board will do a conformity analysis of the environmental assessment report against the terms of reference.

It would be in the best interests of the Department of Transportation to include in an environmental assessment report any information that is important to the MVEIRB decision, for many reasons. (Section 7 of this document describes what information should be included in the environmental assessment report.)

First, the MVEIRB will not make a decision on the extension until it is satisfied that it has enough information to fulfil its responsibilities (see point 5.2 above). If the MVEIRB does not have enough information to do this, it will request more, which may delay a decision and cause scheduling and resource difficulties for the Department of Transportation. It is clearly in both the interests of the Department of Transportation and the MVEIRB to meet environmental assessment obligations as efficiently as possible. It is therefore most cost-effective for the Department of Transportation to submit an Environmental Assessment document that fully meets the needs of MVEIRB as soon in the process as possible.

Second, the better the Environmental Assessment Report by the Department of Transportation, the fewer outstanding questions the MVEIRB will have. This is very much in the Department of Transportation's interests, because outstanding questions increase the chances of the MVEIRB ordering an Environmental Impact Review. An Environmental Impact Review could involve public hearings, and the approval process for the highway extension would be shorter if an Environmental Impact Review is not required.

Third, it is likely that, in preparing a good Environmental Assessment Report, environmental problems arising from the development can be better anticipated and avoided. This can reduce the Department of Transportation's environmental liability, and save money on environmental remediation in response to unexpected environmental impacts.

Fourth, in preparing the Environmental Assessment Report before finalizing all development details, mitigation measures can be better considered, and the design of the extension itself improved.

Finally, the MVEIRB will have a clear idea of the information needed to make their decision. If it is not provided up front, it will request the information. The environmental assessment process will be shorter if the MVEIRB does not need to request supplementary information. A shorter process would hasten development construction and would avoid uncertainties in scheduling. This could simplify financial planning for the development. Also, if the MVEIRB wants information that has not been submitted, it has all the subpoena powers of a superior court, and can order any federal or territorial government department to produce any documents and provide any information in their possession. Since it is thus empowered to get the information needed to fulfil its responsibilities, the Department of Transportation is well advised to save time by making every effort to ensure that the Environmental Assessment Report is as thorough and clear as it needs to be.

The MVEIRB will also be looking for evidence of the extent and effectiveness of community consultations undertaken by the Department of Transportation, as part of the MVEIRB's determination to hold its own consultations.

The information contained in the environmental assessment report can be compiled early and submitted during preliminary screening. Although the information in an Environmental Assessment Report is not legally required by the preliminary screening authority, that authority will require much information about development nonetheless. It is likely that the Mackenzie Highway extension, if proposed, will ultimately be referred to the MVEIRB, who will want an Environmental Assessment Report. This being the case, the Department of Transportation would be wise not to wait until an Environmental Assessment Report is

requested by the MVEIRB, but instead to prepare all the relevant information before preliminary screening (in consultation with MVEIRB). This will facilitate preliminary screening, and will speed up the overall process.

There is also the remote possibility, if screeners are fully satisfied that the development has received careful consideration and is very well planned with all necessary mitigation measures, that the preliminary screeners will not refer the development to the MVEIRB for an Environmental Assessment. If the authority conducting preliminary screening determines that the extension might cause significant adverse environmental effects or public concern, it will be referred to the MVEIRB. If documentation submitted for preliminary screening satisfies the responsible authority that this is not the case, they will not refer the development to the MVEIRB. Although there is a slim chance of this, the Department of Transportation would maximize this likelihood by demonstrating to preliminary screeners that the planning of the extension reflects the issues identified by thorough scoping and that proposed mitigation measures are sufficient. The Department of Transportation's best chance to demonstrate this is by submitting the information needed for an Environmental Assessment Report. Since the Environmental Assessment Report would most likely need to be prepared anyway, it would be in the Department of Transportation's best interests to prepare it prior to preliminary screening.

5.4 Possible Outcomes

The MVEIRB has to choose from five options that an Environmental Assessment can lead to:

1. If no significant adverse environmental effects seem likely from the extension and it causes no significant public concern, the MVEIRB will decide that an Environmental Impact Review (the next stage of assessment) is unnecessary.
2. If the MVEIRB determines that significant adverse environmental effects are likely, it can order an Environmental Impact Review, the most rigorous stage of environmental impact assessment. It is conducted by a review panel.
3. If the MVEIRB determines that significant adverse environmental effects are likely but mitigable, it can conditionally recommend development approval if the mitigation measures that it considers appropriate are implemented.
4. If the MVEIRB determines that the development is likely to cause significant public concern, it will order an Environmental Impact Review (unless the responsible federal ministers refer it to a joint review under the Canadian Environmental Assessment Act).
5. If the MVEIRB decides that the likely adverse environmental impact is "so significant that it cannot be justified (s.128(1)(d))", it will recommend that the proposal be rejected with no further assessment.

The MVEIRB will make a report on the environmental assessment, and distribute it to the Minister of Indian Affairs and Northern Development, to preliminary screening bodies, to the Department of Transportation and to any other referring body (MVRMA sec.128(2-4)). The Minister may accept MVEIRB's report. If the report is rejected (sec.130b), the Minister may choose to refer the development to an Environmental Impact Review even if the MVEIRB does not recommend it ((s.130a). The Minister may also consult with the Minister

of the Environment and set up a joint review under the Canadian Environmental Assessment Act, if they feel that this would be in the national interest (s.130c).

5.5 Predicted Outcome of the Environmental Assessment

Unlike the outcome of preliminary screening, the outcome of the environmental assessment is hard to predict, because it depends on more variables. The outcome will depend largely on how well the Department of Transportation prepares its environmental assessment report.

If the MVEIRB is satisfied that the development produces no unacceptable impacts or significant public concern, it will recommend approval (under MVRMA sec.128a or 128b(ii)). This is only possible if there is no significant public concern, and if:

- the MVEIRB is satisfied that the important issues have been identified through a thorough scoping process and, if necessary, by public input and expert opinion during the MVEIRB's environmental assessment,
- the MVEIRB is satisfied that the Department of Transportation has conducted an accurate enough assessment with sound predictions and evaluations of their significance, and
- the issues have been sufficiently addressed and that the residual effects of the development are acceptable.

To maximize the odds of this, the following are some things that the Department of Transportation should do:

- The Department of Transportation should be diligent in early scoping and community consultation to reduce uncertainties during environmental assessment process.
- Where information is lacking in order to do an assessment of the impacts of the highway extension, the Department of Transportation should carry out baseline studies.
- The Department of Transportation should focus the environmental assessment report on the key issues identified, and assess them as well as possible (see Appendix for details).
- The Department of Transportation should consider the issues identified and design the highway extension around them where possible.
- Where adverse impacts cannot be avoided by design of the highway extension, the Department of Transportation should focus on identifying effective mitigation and remediation options to deal with any significant adverse impacts wherever possible.

If the Department of Transportation does all of these things, the MVEIRB may recommend conditional approval of the development with mitigation measures. Nonetheless, there is still the chance that there will be significant adverse effects or public concern that may lead the MVEIRB to order an Environmental Impact Review of the highway extension.

6 Environmental Impact Review

An Environmental Impact Review is the third and final possible stage of the environmental impact assessment process of the MVRMA. It involves the formation of a Review Panel by the MVEIRB to investigate any relevant issues that were unresolved by the environmental assessment and require further public examination. An environmental impact review would involve the submission of an Environmental Impact Statement by the Department of Transportation, and public consultations or community hearings (MVRMA sec.134a-e).

6.1 The Review Panel

The review panel is appointed by the MVEIRB, and has a minimum of least three members, one of whom is a chairperson. These people can be, but are not necessarily all, members of the MVEIRB. Technical experts may also be appointed to the panel by the MVEIRB. Because the highway extension would be developed predominantly within Sahtu and Gwich'in settlement areas, at least two members of the review panel would be members nominated to the MVEIRB by First Nations (MVRMA 132(4b)). Most likely, one would be a Gwich'in nominee and the other a Sahtu nominee.

The review panel will follow a Panel Terms of Reference set by the MVEIRB in consultation with responsible ministers and Gwich'in and Sahtu First Nations.

6.2 Joint Reviews and Transboundary Considerations

There are three instances when a joint review with a jurisdiction outside of the Mackenzie Valley may come about:

- 1) following the completion of the environmental assessment stage, MVEIRB's report identified areas outside the Mackenzie Valley on which the highway extension is likely to have a significant adverse impact on the environment (s.128(4)),
- 2) when the federal Minister has ordered a review, and has identified areas outside the Mackenzie Valley on which the highway extension is likely have a significant adverse impact on the environment (s.130(2)), or
- 3) when a regulatory agency has ordered a review, and has identified areas outside the Mackenzie Valley on which the highway extension is likely to have a significant adverse impact on the environment (s.131(3)).

In these cases, the MVEIRB may enter into an agreement with the EIA authority in the region outside the Mackenzie Valley that is likely to be impacted. This agreement may provide for co-ordination of the EIAs conducted by the two authorities, or a joint panel may be established to conduct the environmental impact review. The MVRMA does not provide guidance on how a joint panel process would occur.

In the case of the Mackenzie Highway extension, the other areas to which this could apply will be the Inuvialuit Settlement Area and the Yukon Territory, primarily because of the possibility of adverse socio-economic impacts that might arise as an indirect result of new and different road access.

There is also a possibility that the Inuvialuit Settlement Area, Nunavut and the federal government may be involved due to the potential cumulative effects of this development on the Bluenose caribou herd. This herd ranges through the development area, the Inuvialuit Settlement Area, Tuktu Nogait National Park, and the western tip of Nunavut around Bluenose Lake. The likely effects of the extension will not necessarily be sufficient to cause a joint assessment with these jurisdictions under MVRMA section 140(2). The recently screened Ikhil Pipeline Project was reviewed under Inuvialuit, COGOA and CEAA legislation in 1997 (Golder Associates 1997). That project was more within the herd's range than the highway extension. The Ikhil process was completed without the involvement of jurisdictions that share the Bluenose herd with the Inuvialuit.

At the present time, the Nunavut Impact Review Board does not yet have a detailed process for transboundary assessment. Both the Inuvialuit Final Agreement and the Canadian Environmental Assessment Act contain specific transboundary provisions.

6.3 The Environmental Impact Statement

The review panel may request an environmental impact statement from the Department of Transportation. The panel will first consider all existing assessment documents for the highway extension, including the environmental assessment report prepared by the Department of Transportation during the previous environmental assessment stage. If MVEIRB determines that the existing environmental assessment report by the Department of Transportation is equal to an environmental impact statement, they will not require the Department of Transportation to produce an EIS. The MVEIRB may involve the public in determining whether or not existing documents are sufficient substitutes for an EIS. If no EIS is needed, the panel may go directly to holding hearings and consultations.

If it is determined that an EIS is required, then the review panel will conduct their own research and produce a Terms of Reference for the Department of Transportation outlining the requirements of the EIS. The draft EIS guidelines may be subject to public review prior to being finalized.

The scope of an environmental impact review panel must consider all the factors that the MVEIRB was legally required to consider during environmental assessment (MVRMA sec.117(2)). In addition to those considerations, and environmental impact review is required to consider the following (sec.117(3)):

- a) *the purpose of the development;*
- b) *alternative means, if any, of carrying out the development that are technically and economically feasible, and the impact on the environment of such alternative means;*
- c) *the need for any follow-up program; and*
- d) *the capacity of any renewable resources that are likely to be significantly affected by the development to meet existing and future needs.*

Note that even though it was not specifically prescribed by the MVRMA, the Department of Transportation would be well advised to have included much of this

information into the environmental assessment report at the previous stage of assessment (as described under the Appendix). In the environmental assessment report, this information should be included because it would be helpful to the MVEIRB, but in the environmental impact review stage, the MVEIRB is legally bound to consider it. On a practical basis, the Department of Transportation should bear in mind that any issues that have been fully resolved during the environmental assessment will not be raised again during the environmental impact review.

6.4 Predicted Outcome of an Environmental Impact Review

Unlike an environmental assessment, there are only two major outcomes for an environmental impact review. The panel will either recommend development approval (possibly with mitigation measures) or will recommend that the development proposal be rejected. The outcome of an environmental impact review will depend on whether or not the review panel is satisfied that the Mackenzie Highway extension will not cause unacceptable significant adverse environmental impacts and will not harm the social, cultural and economic well being of residents and communities in the Mackenzie Valley. In other words, the decision of the panel can be expected to reflect the guiding principles of Part Five of the MVRMA (sec.115).

Unless completely unanticipated serious issues arise, it is likely that an environmental impact review of the Mackenzie Valley highway extension would recommend development approval **under the condition that appropriate mitigation measures are identified and adopted.** This forecast is made because of the nature and location of the development - highway developments in general are not new or experimental types of developments, and their general impacts are reasonably well understood and can probably be acceptably mitigated. Also, the proposed route is partly developed at present (as a winter road), so the context is probably not as sensitive as, for example, a road through largely undeveloped barrens.

One of the factors that this prediction depends upon is that suitable mitigation measures can be identified. This assumes that once the likely potential impacts of the extension have been identified, the Department of Transportation will identify mitigation measures that can be relied upon to effectively reduce or eliminate significant adverse environmental impacts. If multiple mitigation options exist, it would be to the Department of Transportation's advantage to identify a few of the best options for each significant impact where possible.

Another of the factors that this prediction depends upon is that no major "surprise" issues arise. Although the possibility exists that, due to site specific conditions, the extension would cause serious unacceptable residual effects after mitigation, this is considered unlikely. The thorough and early scoping conducted for the extension increases the odds of any such issue being identified at an early enough stage that the development could be designed around any such issue. Thorough and early scoping decreases the risk that such an issue will arise unexpectedly later in the assessment process.

7 Environmental Assessment Report Contents

This Appendix will describe what should be included in an environmental assessment report on the highway extension. It is based on the contents of the MVRMA, that MVEIRB's document *Environmental Impact Assessment in the Mackenzie Valley: Interim Guidelines* (1999) and professional standards of practice. The contents of the environmental assessment report may be formally guided by the MVEIRB in Terms of Reference. The Terms of Reference can be drafted by the Department of Transportation and then submitted to the MVEIRB for approval.

The environmental assessment report should contain all the information needed by the MVEIRB to make a wise decision about this development (see 5.3 above), in accordance with its legal responsibilities (see 5.2 above), while excluding information that is not directly relevant to that decision.

In order to do this, the scope of the environmental assessment report must be appropriate to address the important issues associated with the highway extension. The prediction and evaluation of impacts in the environmental assessment report should reflect the issues that have been identified through community consultation and scoping sessions.

In order to meet the environmental assessment requirements of the MVRMA (described in 5.2 above), the environmental assessment should include the prediction of likely impacts, an evaluation of their significance, and descriptions of mitigation and remediation measures that the extension would involve.

7.1 Assessment Scope

In every environmental impact assessment, the footprint of a development and its area of impacts make up the scope. The MVEIRB have the authority to decide on the scope of the highway extension project that will undergo environmental assessment. The MVEIRB may produce guidelines for the determination of the scope of developments, so it is in the Department of Transportation's interest to discuss this with the staff of the MVEIRB. Whatever is decided to be the scope of the highway extension should be clearly stated in the environmental assessment report.

The report should describe the environmental scoping that has occurred. This will provide the MVEIRB with an understanding of why the assessment deals with the issues that it does, and will ensure that the MVEIRB is fully aware of the level of public participation and technical consultation that has already occurred early in the Mackenzie Highway extension planning process.

While detailed documentation of issue scoping would be best left for an appendix to the report, the environmental assessment report should summarize the issues that arose during community, public, and technical consultation. The report should also describe the prioritization of those issues. This is necessary to demonstrate that the environmental assessment report is adequately focused on the most important issues. It will also demonstrate the Department of Transportation's commitment to early issue identification

and community consultation, both of which are important aspects of good environmental assessment.

7.2 Project Description

Before impacts can be predicted, it is necessary to know what activities the highway extension will involve. This should include details about activities involved in the construction, operation and decommissioning of the extension, describing *what* will be involved, *where* it will happen, and *when* it is planned to occur. The project description should provide a complete picture of all the elements and activities considered to be within the scope of the highway extension development. Some things which may be included are the description of the route; physical description of camps and other infrastructure and their surroundings; the use of water and the handling of waste water; the location of all quarrying sites; transportation methods; equipment being used; fuel storage; explosives storage; etc.

Because environmental scoping for the extension is being conducted appropriately early in the development cycle, the design of the extension is able to incorporate environmental considerations. It should be clearly indicated in the project description section of the Environmental Assessment Report exactly how this was done. In essence, the Department of Transportation should explain how environmental considerations affected the highway extension during the development process.

In addition to describing the proposed development, the MVEIRB will most likely want a description of the purpose for extending the Mackenzie Highway and why it is needed, the Department of Transportation's performance record and descriptions of any available alternatives to the extension that would achieve the same goals.

7.3 Existing Environment

In addition to knowing what the proposed development will involve, it is also necessary to understand what conditions currently exist in order to make meaningful predictions. *It is essential that the conditions described are those that are relevant to the issues identified during scoping*, because this is the information will be helpful to the MVEIRB in making good decisions about the highway extension. Do not attempt to compile comprehensive information about all aspects of existing conditions for the Environmental Assessment Report. This would be a major undertaking, and the time and money spent doing this would be better spent focussing on making good predictions about the relevant issues and identifying good mitigation measures to deal with adverse impacts. Referencing the existing information on baseline conditions (such as the research done in the early 1970s) is fine, but do not compile it into the environmental assessment report unless it pertains to relevant issues. Similarly, the boundaries of the study area for which conditions are described should reflect the potential geographic and temporal scope of the relevant effects of the extension.

Note that the existing information is not just a snapshot inventory of the current biophysical conditions. Any existing fluctuations in baseline conditions over time should be identified, along with the range of fluctuations, so that it may be understood how representative current conditions are. Also, the ecological interrelationships of ecosystem components should be

emphasized, along with the associated uncertainties where there is no good understanding of ecosystem inter- (and intra-)dependence. As well, as dictated by the issues identified in scoping, it will most likely be necessary to describe different aspects of the existing socio-economic and cultural conditions. These too are, in many ways, linked with one another, and with ecological conditions. These linkages should be identified where relevant.

Traditional knowledge can be a very useful source of information on existing ecological conditions, as well as their social and cultural linkages. Because Aboriginal peoples have been living closely with the land for many generations, they are familiar with it both in site-specific ways, in terms of interrelationships, and over very long periods. However, traditional knowledge is very context sensitive, and the time spans involved in conducting research for an environmental assessment are very different from those required for credible traditional knowledge research. The Department of Transportation must therefore be very careful in applying the results of development-specific traditional knowledge studies for these reasons.

7.4 Prediction of Impacts

In the Environmental Assessment Report, the Department of Transportation should use its knowledge of the activities involved in the highway extension, with its understanding of existing conditions, to predict what the impacts of developing the highway extension will be. The predictions themselves should be done by appropriate specialists: e.g. aquatic specialists for aquatic impacts, socio-economic specialists for socio-economic impacts, etc. However, even though predictions will mostly be made by technical specialists, they must be described clearly, so that they are readily understandable to the MVEIRB. All uncertainties should be indicated. Note also that traditional knowledge may be useful in predicting social, cultural and environmental responses to change.

In addition to predicting and describing the impacts that are likely to result from the development, the MVRMA (117(2a)) specifies that the environmental assessment report should also describe the impacts of accidents or malfunctions, and cumulative impacts.

7.5 Cumulative Effects Assessment

In terms of cumulative effects assessment, the environmental assessment should predict the effects of the development on “the big picture”, to include an account of what the effects of the highway extension will be in conjunction with the effects of all other developments. This should include past, present, and reasonably foreseeable future developments, because this is the only way to address the overall “on-the ground” environmental effects of development in general on a given valued ecosystem component. In order to do this adequately, the assessment should identify the valued ecosystem components about which there is concern, identify all other human activities that may affect those components, and predict the combined effects of the highway extension in combination with other human activities.

The Environmental Assessment Report must concentrate on the valued ecosystem components which will be affected by the highway extension in conjunction with the effects

of all other human activities. Even if the highway extension *on its own* may not have a significant effect on a valued ecosystem component, it may cause a cumulative effect on that component that is significant. Because of this, the focus of the cumulative assessment should not be limited to the valued ecosystem components identified in the rest of the Environmental Assessment Report. Conversely, no matter how important a given component is, the Department of Transportation should not include valued ecosystem components in the cumulative effects assessment *unless* they have the potential to be affected by the highway in combination with the effects of other human activities.

Next, the Department of Transportation should identify other human activities that could cause an impact on the same valued ecosystem components as the highway extension would. Overlap of impacts from different human activities across both space and time should be considered. Projects that are nearby (e.g. oil developments) should be considered carefully because of their proximity to the same resources. Also, projects that involve similar types of activities (e.g. stream crossings) should be considered carefully because they may produce similar types of effects that might compound those of the highway extension. Distant projects, however, may also cause effects that will act in combination with the effects of the highway extension if they affect the same individual valued ecosystem components. For example, the highway extension might act in combination with the Bennett Dam on the Peace River to cause cumulative effects on the Mackenzie River.

Because cumulative effects assessment requires the consideration of past, present and future human activities, the Department of Transportation will have to consider relevant future developments that could cause cumulative effects on valued ecosystem components. The importance of considering future developments adequately in cumulative effects assessment has been recently demonstrated in Alberta, where approval for a major development project (the Cheviot Mine) was rejected partially because of inadequate consideration of future developments. The Department of Transportation should meet with the MVEIRB to ensure that expectations about the scope of future projects to be included in the cumulative effects assessment are clear. The Sahtu and Gwich'in Land Use Planning Boards should be consulted to aid in consideration of future projects that can be foreseen around the highway extension. Outside of settlement areas, consultations with DIAND and other agencies likely to be involved in major development projects may be useful in identifying relevant future developments.

Once the valued ecosystem components relevant to cumulative effects assessment have been identified, and the other human activities that are likely to influence those same components have been determined, the cumulative effects of the highway extension in conjunction with other human activities should be predicted. This prediction should follow a method that is identified by the subject specialists as most appropriate to each individual ecosystem component studied, so long as the method is able to reflect the full range of different activities that may act in conjunction to cause an impact. It is necessary for the prediction method to be versatile enough to incorporate all the effects of human activities on a given valued ecosystem component so that a variety of different types of effects can be meaningfully integrated into a single reasonable impact prediction.

Beyond its broader and deeper scope, cumulative impact assessment for the extension will be similar to non-cumulative impact assessment. The significance of both types of impacts

should be clearly established (as described below in section 7.6), and mitigation measures should be designed to eliminate or reduce the degree of both kinds of adverse impacts and to maximize desirable impacts (section 7.7).

7.6 Significance of impacts

In addition to predicting what the impacts of the Mackenzie Highway extension are likely to be, the environmental assessment report must evaluate the significance of the predicted impacts (MVRMA sec.117(2b)). This should involve a weighing of many factors. Questions to be addressed by the Department of Transportation in evaluating the significance of each impact should include:

- What is the importance of the impact to affected persons?
- What is the geographical scope of the impact?
- How long will the effect last, and with what frequency will it occur?
- How great will the magnitude of the impact be?
- How essential is the affected ecosystem component to overall ecosystem health?
- What is the certainty of the impact? What is the likelihood of the impact occurring, and how great is confidence in mitigation measures?
- Is the impact adverse or beneficial?
- Is the impact reversible?

The significance of all impacts within the scope of the assessment (including cumulative impacts) should be evaluated. The significance of residual impacts after mitigation and remediation measures should also be clearly described.

7.7 Mitigation and Remediation Measures

According to the MVRMA (sec.117(2d)), the MVEIRB is required to consider the effect of mitigation and remediation measures. Mitigation measures reduce or prevent adverse environmental impacts. Remediation measures reverse (or partially reverse) undesirable impacts. Where likely significant adverse environmental impacts are predicted from the Mackenzie Highway extension, any feasible mitigation measures should be described in the environmental assessment report.

The report should describe what the mitigation or remediation measures are, specify which impacts the mitigation or remediation measure is intended to address, and describe what the mitigation or remediation measure will do- that is, how much of the problem will it solve? The report should describe the timing of these measures, and should also describe the basis for confidence in the measures. The environmental assessment report should make clear to the MVEIRB the consequences of applying or not applying mitigation measures. This section should also discuss how new is the technology involved in the mitigation or remediation measure, and include, where possible, accounts of uses of the measure in other developments and the success of those uses. Finally, the effects of mitigation measures on impact significance should be predicted, to determine what the residual impact is likely to be.

Note that since cumulative effects will involve the effects of the highway extension in combination with other developments, the Department of Transportation has the option, if necessary, of making the cumulative effects of the highway extension acceptable by mitigating the effects of *other* developments contributing those same cumulative effects.

7.8 Other Relevant Matters

The MVRMA (sec.117(2e)) enables the MVEIRB to take into consideration any other matters that it deems relevant to the environmental assessment.

The report should include follow-up plans for monitoring, evaluation and management of uncertain impacts. The MVEIRB may also consider follow-up as a mechanism for checking environmental performance and for verifying the accuracy of impact predictions and the adequacy of mitigation measures.

The MVEIRB will also want the following included in the environmental assessment report:

- An executive summary (in all relevant languages)
- A list of references for information sources
- A list of authorizations required

8 Summary and Conclusions

To recap, if the Department of Transportation does propose the highway extension, its assessment will occur under the MVRMA regulatory and environmental impact assessment regime. This development is likely to be referred by preliminary screening authorities to the MVEIRB, who will conduct an environmental assessment on it, and may further conduct an environmental impact review.

The outcome of the environmental assessment will depend largely on how well the Department of Transportation prepares its environmental assessment report, if the extension causes significant public concern, and whether the likely residual environmental effects of the fully mitigated development are considered by the MVEIRB to be acceptable.

In order to maximize the odds of effective, fast and efficient assessment the Department of Transportation should:

- be diligent in early scoping and community consultations to reduce uncertainties during environmental assessment process;
- focus the environmental assessment report on the key issues identified, and assess them as well as possible (see Appendix for details);
- where impacts can not be adequately assessed because of insufficient information, conduct baseline studies;
- consider the issues identified and design the highway extension around them where possible; and,
- where adverse impacts cannot be avoided by design of the highway extension, focus on identifying effective mitigation and remediation options to deal with any significant adverse impacts wherever possible.