# Granular Resource Requirements for Proposed Mackenzie Valley Pipelines:

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*SECTION 8.*

*DISCUSSION PANEL "B"*

# *POTENTIAL CONSTRAINTS TO BORROW DEVELOPMENT*

## POTENTIAL ENVIRONMENTAL IMPACTS: FISHERIES

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This paper describes the developmental impacts on fisheries. At the same, it covers some aspects that the Department of Fisheries and Oceans (DFO) has in carrying out its mandate.

The DFO in the Northwest Territories (NWT) is split into three operating areas: Western Arctic, South-Central Arctic and Eastern Arctic (Figure 1). When the various land claims come into play, these boundary lines will change. There are three offices that are dealing with each of these areas: Yellowknife deals with South Central, the western Arctic office is in Inuvik and the Eastern Arctic is handled from Iqualuit.

Regulatory requirements are basically the "hammer" that DFO has to monitor and control the development of fisheries. The main piece of legislation is the *Fisheries Act* which allows us to maintain our mandate, the management of fish marine mammals and their habitats. The following paragraphs briefly describe the *Act*.

The definition of a fish includes shellfish, crustaceans and marine animals, and the egg, spawns, spat, and the juvenile stage of fish, shellfish, crustaceans and marine animals. So, whales are thus considered fish in a "legislative sense". As well, all the different stages of fish--salmon eggs, any fish eggs, juvenile stages--we protect all their habitats and at different life stages. That could have serious implications in terms of time constraints for any pipeline development.

The definition of fish habitat under the *Fisheries Act* is: spawning grounds, nursing, rearing, food supply, and migration areas in which fish depend, directly or indirectly. And the indirect habitat areas (feeder tributaries) are fairly important, in carrying out the life processes. Consider a feeder tributary which is blocked off to any migration and does not contain any fish *per se* but does provide downstream food for fish producing invertebrates, and that food in turn flows downstream and is eaten by a fish, then that also is considered to be fish habitat.

There are several sections of the *Fisheries Act* dealing with the management of various fish and fish species. Some of them will be directly involved with your work and some will not.

- The federal Fisheries Minister may require that a fishery be constructed around construction works to allow fish migration to spawning habitat.

- *Section 28* deals with explosives, such that, unless authorized by the Minister, the proponent is not allowed to use explosives in the work in areas where fish may be disrupted by the explosives; either killed outright or if it affects their habitat at all.

- *Section 29, Fish Passage.* Any developments including construction or installation of culverts. The culverts and bridges or whatever structure placed across the water body, must allow for passage of the fish.

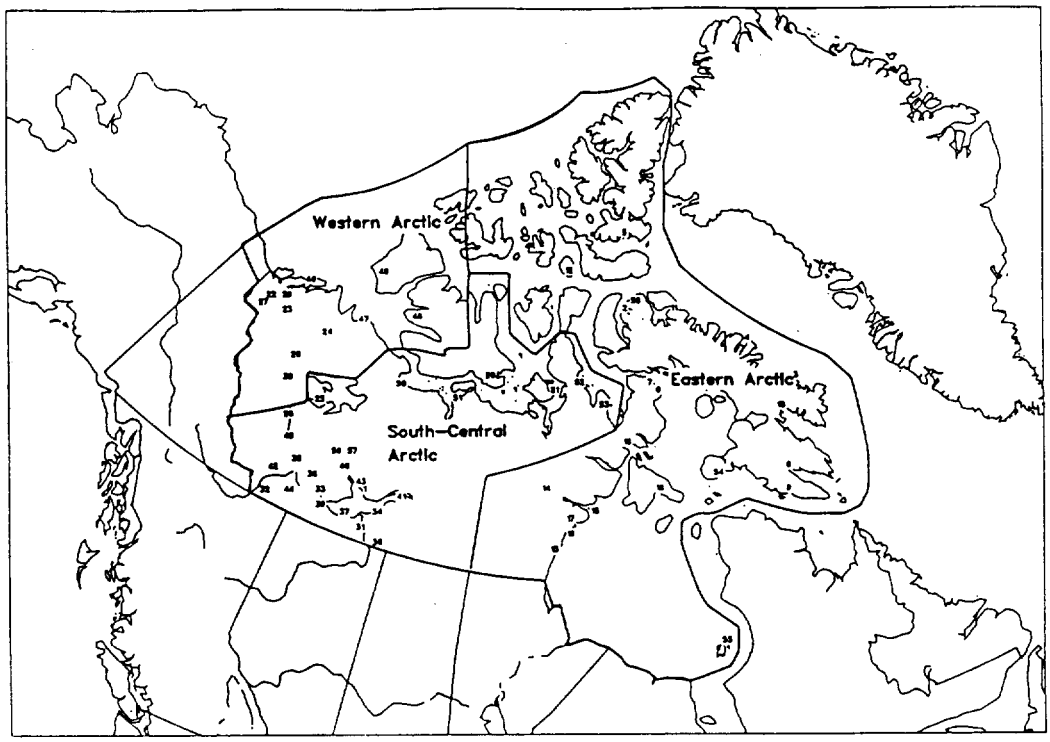
- *Section 32, Destruction of Fish.* It is unlawful to destroy fish by any means other than licensed angling or fishing.

- *Section 35, Habitat Destruction.* Deals with harmful alteration and destruction of fish habitat and *Section 35.1* states that people are not allowed to do that. Under *Section 35.2*--one could be authorized to destroy fish habitat given a suitable compensation package or mitigation.

- *Section 36.3* deals with the deposit of deleterious substances and that's recently become a shared responsibility of the Department of Environment and DFO.

- *Section 37.1* states that the Minister may request any analyses, plans, engineer's drawings, plans, description of project, on

**Figure 1. DFO Operating Areas**




projects which could potentially affect fish and fish habitat, so fisheries can make requests for more information.

## DFO OPERATIONS AND POLICIES

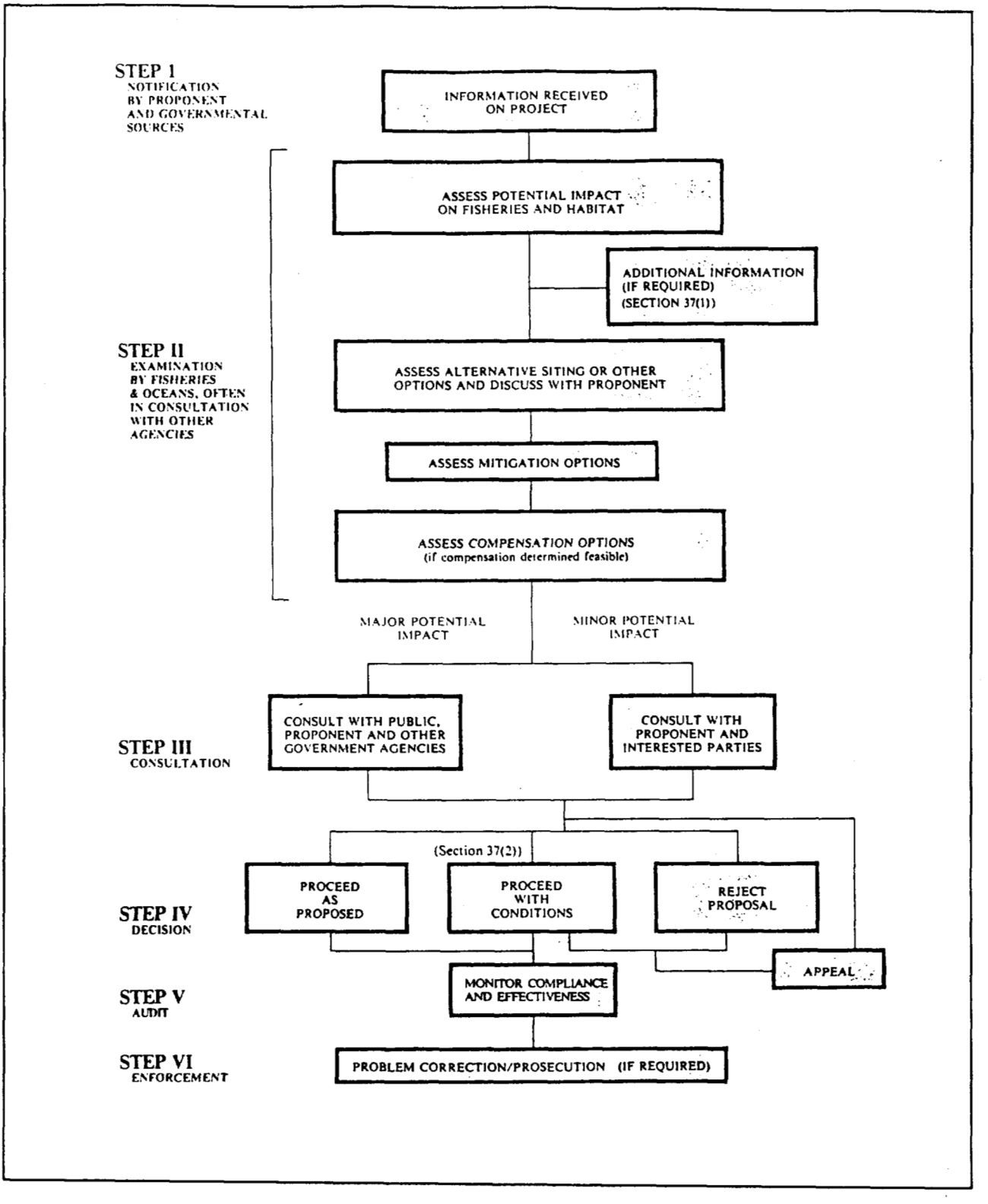
The Federal government is quite serious about their protection of fish habitat. The amended *Fisheries Act*, in terms of the penalties sections, was amended in February of 1991 and fines were substantially increased. For example, *Section 35* and *Section 36* offences, went from a range of $5,000 to $10,000 to up to $300,000 for the first offence and up to $1,000,000 for subsequent offences, as well as associated jail terms for indictable offences.

In 1986 DFO developed a policy framework under which to work with project proponents, as well as what our overall objectives were. The overall objective is certainly a net gain because we have lost a great deal of fish habitat in the previous years. This objective is to be reached through the implementation of DFO's three goals in habitat conservation: first, habitat restoration for degraded habitats that we want to redevelop; second, habitat development into areas which weren't previously utilized by fisheries; and, third, the achievement of no net-loss of productive capacity of habitats. Productive capacity basically means that you don't want to lose what you already have, and this is done with an integrated approach with proponents and developers and the DFO. There are six implementation strategies to achieving no net-loss, including: protection and compliance, integrated resource planning and research, public consultation, public information/education, cooperative action and monitoring of the fisheries resources. The procedural "steps" to achieving no net-loss are shown in Figure 2.

The procedural steps are:

- notification that the information is received on a project. If there isn't enough information, we'll certainly ask for more.
- assessment of the potential impact of the development on fisheries and habitat. If we aren't quite sure what's going to go on, or if there is a stream crossing, or we aren't sure of how much gravel is to be extracted or the timing of it, then we'll go back to the proponent and ask for that information.

**Figure 2. No Net-Loss Procedural Steps**



- Assess alternative siting or other options and discuss it. If there are problems with that particular location, then we'll go back to the proponents and ask--Why this one? Does it have to be here? Can you get the same quality of gravel elsewhere?

- Assess mitigation options. If all anticipated impacts can be mitigated against, DFO issues a letter to the proponent indicating the necessary mitigation and the project will be allowed to proceed.

- Assess compensation. If a project is going to cause fish habitat loss, it is quite difficult to compensate elsewhere in most cases. There is a hierarchy of compensation which DFO applies; the most desirable being on-site compensation. In most cases, this means protect the area, protect the same fish stock, and the same gene pool. At the next level of the hierarchy DFO would look at off-site compensation and at the bottom of the list of alternatives, a choice we don't even really want to consider, is the buy-out option. The buy-out option was allowed in the past, but is not encouraged any longer. If there is a minor potential impact the DFO would consult the proponent and interested parties.

  In the NWT, we are in consultation with the Inuvialuit, and now with the Gwich'in. The Inuvialuit have established an Environmental Impact Screening Committee and examine each proposal prior to authorization of any construction which might impact fish habitat. DFO must also seek agreement with the Environmental Impact Screening Committee prior to issuance of any authorization.

- In terms of consultation, we're going to get into review boards and panels which also involve the local people, as well as any other interested parties. At that time, the decision comes out--proceed as proposed; proceed with conditions; or, reject the proposal. The proponent has the option to appeal the decision.

Much of the north has very little information on fisheries resources. So, if we haven't got the background data, enquire. This is something to consider when you're setting out your timelines for your projects. It could take two spawning seasons or up to two years to determine what impacts are going to be on any particular fisheries resource.

### Fish Life Cycle

The main thing to consider are the elements that fish depend on in order to survive--from eggs right through to the end of their lifetime. Fish require certain things in water. That will vary with fish species but generally they require: a temperature range to live in; a certain amount of O2--dissolved oxygen in the water; some clarity to the water, clear for vision so they can see their food or so that the water's clean enough that they're not clogging their gills and then dying as a result; and, a medium for production of food--either invertebrates or other fish species. If you start tp modify that habitat and altering one or more of those facets, the fisheries will be affected.

For example, if a proponent is completing a coring operation on a stream bed, the stream flow will likely be reduced. As a result, you would have taken away a lot of the fish habitat providing food for them aswell as the habitat that's providing cover for them which is either to protect them from sunlight, protect them from other fish or just providing a medium that holds the water temperature constant. You may have removed access for the fish--there may not be enough water left for the fish to move up to another stream or another portion of the stream or into another lake that supplies either food resources that they need or their spawning habitat. Sediment in a stream can also be classified as a deleterious substance which is chargeable under two sections of the *Fisheries Act*.

There will be an alteration of the food that's available within the stream simply because modifications have been done on what was there. A completely different habitat can result and that is going to either cause a complete shift in organisms into something else or a complete loss of organisms. Fish have to see their prey so an increase or decrease in turbidity will cause vision problems. Abrasion of gills through high sand flows in a stream will also affect gill performance.

Finally, an increase in water temperature could affect the fish physically and it also reduces the oxygen content in the water. The hotter the water becomes, the less oxygen is able to be maintained within the water and it may reach a level that could be toxic to the fish. Changes in stream flows can occur and these can be damaging to fish habitat. If a proponent is

boring in a stream that was originally a small channel of a well defined stream the stream may be caused to open from a smaller, deep channel to a wider, shallower channel. The impacts on fisheries can be significant. First, the water depth is reduced. Second, you probably reduce the water flow. This is why it is important to assess your operations carefully. If you don't have the information available, studies must be done to determine how that stream bed is going to be used.

The authors searched for available material on granular studies and fish habitats within Canada, and, unfortunately, DFO's library does not appear to have much information on this topic. A few studies have been completed in Alaska, however.

We also find that, in many instances, a contractor in the area may not be aware of all of the conditions and agreements that have been made. Instead he is concentrating more on getting the job done without full awareness of what he is doing to the environment. It will be important that the project proponent establish a better link between the construction foreman and his crew. They must be made fully aware of the fact that your company has agreed to protect the fisheries in that stream. Too often we see a contractor out on site, a major pile of gravel sitting in the middle of the stream, and the vegetation around the stream all stripped-out. He clears out all the quarry material and away he goes. We need better communication between proponents and contractors working in fisheries areas. That link is vitally important.

*Note: The text of this presentation has been transcribed from an audio-tape recording of the workshop presentations. If necessary, we would suggest that the reader verify the accuracy of these comments with the presenters.*