

1. A study of the future tanker traffic in Puget Sound by the Honeywell Corporation of Minneapolis has predicted two to four tanker collisions in this area in the next ten years.

2. Canada's concern about possible oil pollution on the Pacific coast.

3. The ecological harm to the Alaskan countryside caused by the melting of the permafrost from the heat generated by hot oil passing through the pipeline. It is estimated the oil would have to be heated to 180 degrees Fahrenheit to be pumped through the pipeline.

4. The frequency of earthquakes in Alaska and the possible effects of such earthquakes on the pipeline. The United States National Earthquake Information Centre has reported that Alaska had 68 reported quakes in 1970.

5. A report by the United States Corps of Army Engineers has indicated it might prohibit the construction of port facilities at Valdez although no reasons have been given for such a decision.

For one reason or another, but chiefly because of strong opposition by groups within the United States, the Department of the Interior has not yet issued a permit to build that pipeline across Alaska. This has given us time to make our views against it known to the Government of the United States, and the passing of the motion may be of some assistance to those who are fighting to prevent its construction. In view of the fact that Alaskan oil is going to go to the continental United States in one way or another it is not enough simply to oppose the pipeline tanker system. It has been suggested, therefore, that a pipeline be built across Canadian territory down the Mackenzie River valley to Edmonton. If this were done it would, of course, eliminate the objections of Canadians to the pollution threat.

Senator Argue's motion urges the Government to proceed with the various economical and ecological studies of alternate routes. The only alternate route which merits serious consideration at present is the pipeline through the Mackenzie Valley. The two voyages of the *Manhattan* proved that oil could be moved from Prudhoe Bay by tanker, but that it would be an expensive as well as hazardous operation. The proposal to move the oil by tanker submarine or by ice-breaking tankers has not apparently merited serious consideration. If Canadians wish to have the United States accept the Mackenzie Valley route to move the Alaska oil to market then we must be prepared to provide the answers to the questions they will raise, and this will require further study and research.

For example, in order to persuade conservationists in the United States to accept and promote the Mackenzie Valley route it will have to be proved that this route has fewer ecological hazards than the Alaska pipeline. How can this be done? For the past three winters studies have been carried out in the Northwest Territories by Mackenzie Valley Pipeline Research Limited to assess the damage to the permafrost by the heated pipeline passing over it. This must be ascertained because if any serious

damage resulted it could upset the feeding and migratory pattern of Arctic birds and animals. I understand that in the tests conducted 4,500 barrels of heated oil are passed over a 2,000-foot loop of pipeline up to 200 times a day to discover if it can be adequately insulated and thus prevent damage to the permafrost. The whole research project has another year to run, but the results to date are satisfactory. Indeed, I think they must be as the Canadian Government has laid down certain guidelines for construction of pipelines in the north.

There are other considerations which require further study on what problems will have to be overcome in building the line from the Alaskan oil fields to Inuvik. As the Mackenzie Valley line would be at least twice as long as the Trans-Alaska one, the financing of its construction might be difficult. It would certainly require a large participation by United States capital.

It is obvious that more study and research is needed on the Mackenzie Valley route. We can all agree with the second part of Senator Argue's motion which urges the Government to proceed with such studies. Indeed, I hope that such studies will be proceeded with at an accelerated rate, because while we are studying the route the United States might build the Trans-Alaska pipeline, for they are people of great drive and energy when they undertake to build anything.

I do not intend to comment at this time on the third part of the motion, which requests the Government to report from time to time upon the most appropriate steps to be taken, in its opinion, to accomplish the prudent and efficient transportation of northern oil and gas. Of course, a study of the prudent and efficient transportation of northern gas and oil opens up a large field. It could well be a complex study as it would have to include the transportation of oil and gas which might be found in the Canadian Arctic islands as well as in continental Canada. If such studies were completed it would be of interest to have the results made available even if the Government did not wish to endorse the conclusions.

I believe that a consideration of the Trans-Alaska pipeline and tanker project and the apparent effects of the system suggests that Canada should seriously oppose the proposed transportation system, on the grounds that severe ecological harm will result to Canada's populated west coast from predicted collisions or other accidents involving supertankers carrying oil cargoes. As I have mentioned, it is not enough to approve this system; we must also be in a position to advocate an alternative one, which at present would seem to be a pipeline through the Mackenzie Valley.

I know that Canadian opposition to the proposed project has been registered, and that fairly high level discussions are to take place next Monday. I hope that such discussions will be fruitful, and that the United States and Canada will join together, as good neighbours should, to arrange a system of transporting oil and gas from the north to our mutual benefit.

Honourable senators, I simply want to add that I am pleased to second the motion so eloquently moved by Senator Argue.