

Granular Resource Requirements for Proposed Mackenzie Valley Pipelines:

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SECTION 5.
TECHNICAL PANEL "C"
TYPICAL BORROW MATERIALS USAGE

TYPICAL NORTHERN TRANSPORTATION BORROW REQUIREMENTS

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ABSTRACT

By far the largest demand for granular resources in the Mackenzie River corridor would come from the completion of the Mackenzie Highway from Wrigley to the Dempster Highway near Inuvik. In order to construct the approximately 1,000 km of new highway, about 350,000 m³ of pit run gravel would be required for capping over fine-grained embankment materials. Surfacing to an acceptable gravel surface standard would require an additional 850,000 m³ of processed granular material. An estimated 30 to 40 percent of this processed material would have to be produced from quarried limestone sources in areas where potential granular sources are scarce. Actual testing and selection of granular deposits would be completed after embankment construction.

Maintenance requirements for a gravel-surfaced Mackenzie Highway from Wrigley to Inuvik would require an additional 3,000,000 m³ of processed material over a 20-year period. If the highway were to be upgraded at some stage in the future, up to 9,000,000 m³ of granular material would be required to pave the 1,400 km gravel surface of the Mackenzie Highway from Inuvik to the Yellowknife Highway junction.

Within the Mackenzie River Valley corridor, the Government of the Northwest Territories (GNWT) currently does not have a lot of transportation facilities. The GNWT does maintain approximately 500 km of gravel surface road between Fort Providence and Wrigley, eight community airstrips and some 270 km of Dempster Highway. This paper briefly outlines the typical requirements for those facilities and future transportation expansion needs.

In terms of airstrips, new construction on an airstrip may require up to 150,000 m³ of fill. Typically that fill is granular material. The site selection for the airstrip generally puts it close to a source of good granular fill where 15,000 m³ of material would be processed for surfacing. The long term maintenance needs for airstrips is minimal, about 10,000 m³ over a 20-year period. GNWT Transportation does not maintain the Norman Wells and Inuvik airports, as yet. New airstrips are expected to be built at Fort Good Hope and Fort Franklin, and possibly one at Arctic Red River. Nahanni Butte is also in the Mackenzie Valley corridor and, in the future, will also have a new airstrip.

In terms of highway maintenance requirements,

between Fort Providence and Wrigley, the ideal quantity for maintenance material would be about 100 m³/km per year. These figures may appear high and it's probably more like 50 or 75 m³/km right now but if we did get up to 100 m³/km, we'd be using 1,000,000 m³ of material over the next 20 years for that 500 km section. There is also the Dempster Highway which would require another 500,000 m³ of process granular material.

Future transportation requirements that are potentially quite large include an extension of the Mackenzie Highway from Wrigley to meet the Dempster Highway south of Inuvik. In 1972, the federal government announced they were going to build the highway (pre-engineering, design and construction) from Fort Simpson to the Dempster in four years. Well that didn't happen. By 1976 they had built the highway to a few kilometres south of Wrigley but there was some opposition to the highway from the Dene Band at Wrigley. The project was then shelved and funds were diverted to the building of the Liard Highway. The Mackenzie Highway ended south of Wrigley. It was then completed to Wrigley in the early 1980s and now in the next couple of years, we're finally getting around to putting in a ferry at Camsell Bend on the

Mackenzie River and a bridge at Willowlake River. By 1994, there will be year-round road access to Wrigley.

Going north of Wrigley to the Dempster Highway is another 800 km of highway to construct and that is in the GNWT Transportation Strategy. However, building 800 km of new highway just isn't within the GNWT's current capital funding. It's going to require a large commitment on the part of the federal government for that portion of highway to be built.

I thought that would be the biggest demand for granular materials, the extension of the Mackenzie Highway, but with recently cited pipeline figures of about 7,500 m³ per kilometer, highway construction does not come near that level of demand.

The federal government had put together preliminary contract packages and survey estimates. My estimates from available information suggest 350,000 m³ of pit run gravel would be required for capping some areas where fine-grained soils have been used. But

surfacing material requirements would only be 850,000 m³ processed material for the 800 km of new highway.

Probably 60 to 70 percent of that would come from natural granular deposits, the other 30 or 40 percent would come from blasted fresh limestone. Maintenance of the Mackenzie Highway extension, if it ever gets built, would be about 3,000,000 m³ of process material over a 20-year period. In its early years, the Liard Highway was constructed of alluvial materials and just a light surfacing gravel which didn't stand up at all.

At some stage in the future, another 9,000,000 m³ of process granular material would be required for paving from the junction of the Yellowknife Highway to Inuvik. That's a big number to me but it still doesn't give me 7,500 m³ per kilometre, that's only about 7,000 m³ per kilometre. The average amount of granular material required, 7,000 m³ per kilometre, is large for highways but less than the 7,500 m³ per kilometre cited for pipeline construction.

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 presenter.