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Executive Summary

LOGISTICS OPPORTUNITIES And TRANSPORTATION IMPACTS

In the Northwest Territories during the Mackenzie Gas Project

Prepared for:

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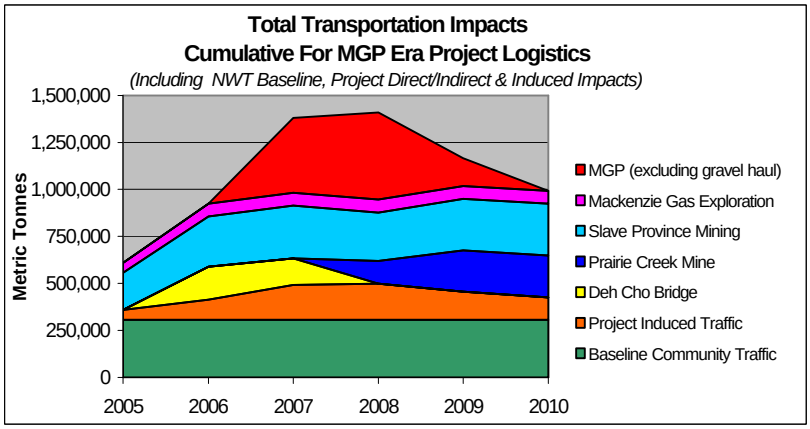
Executive Summary

The purpose of this report is to provide a comprehensive assessment of northern transportation opportunities and impacts during the Mackenzie Gas Project (MGP). Transportation opportunities are developed from the perspective of NWT communities along the MGP pipeline route that could benefit from local sourcing of logistics support. Transportation impacts are developed from the perspective of an NWT transportation system accommodating other projects and ongoing community traffic, as well as the MGP.

This report looks at the cumulative impact of all major NWT projects planned to occur concurrently with MGP construction. A four year schedule for MGP logistics activity is proposed in the *Application to the National Energy Board for Approval of the Mackenzie Valley Pipeline*. Note that recent announcement (in May 2005) of a project delay postpones the indicated impact dates in this report by one year, but does not significantly change any of the anticipated outcomes.

After project approval now anticipated in 2007, preliminary logistics support for infrastructure construction will start in that year, followed by major movement of materials, equipment and supplies in the summer barging seasons preceding two subsequent winter construction seasons. Construction demobilization and pipeline commissioning would take place in 2010.



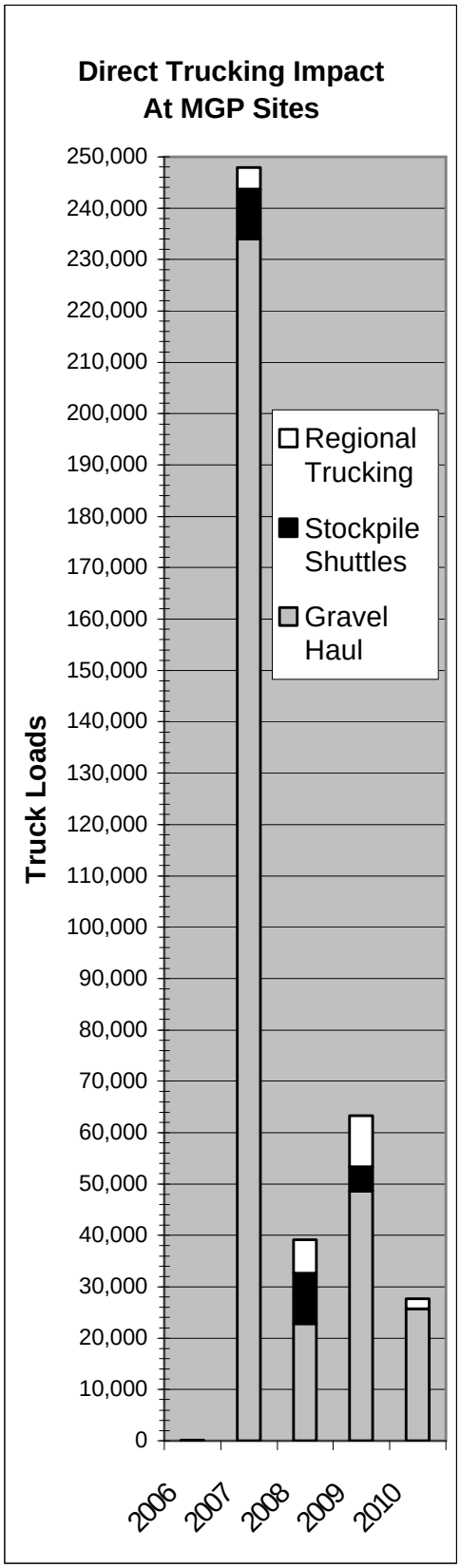
Generally, with the current layering of project impacts (see adjacent figure), MGP schedule slippage will not significantly change the cumulative impact from all projects of over 1.25 million tonnes in each of two peak years.

For the MGP, this report identifies, as local logistics business opportunities, the direct transportation impacts of short truck shuttles to stockpiles primarily in summer; and regional trucking and gravel haul primarily during the winter (see adjacent figure).

The immediate peak year impact of almost one quarter million truckloads is driven by pre-construction Gravel Haul, for MGP access and work site preparation, which overwhelms direct impacts in each succeeding year.

For primarily winter Gravel Haul and Regional Trucking, winter road structural maintenance and traffic congestion problems can be anticipated – but only of a very localized nature (the average gravel haul is only about 13 km) which should be manageable with proper project control over commercial traffic.

For primarily summer Stockpile Shuttle trucking, more than 80% of the anticipated traffic will occur on dedicated project spur roads especially constructed from barge landings and will take place during the summer barge season (the typical stockpile shuttle is less than 3 km). Beyond the all-weather road system, Stockpile Shuttle impacts on winter road operations or from encounters with the traveling public are unlikely.

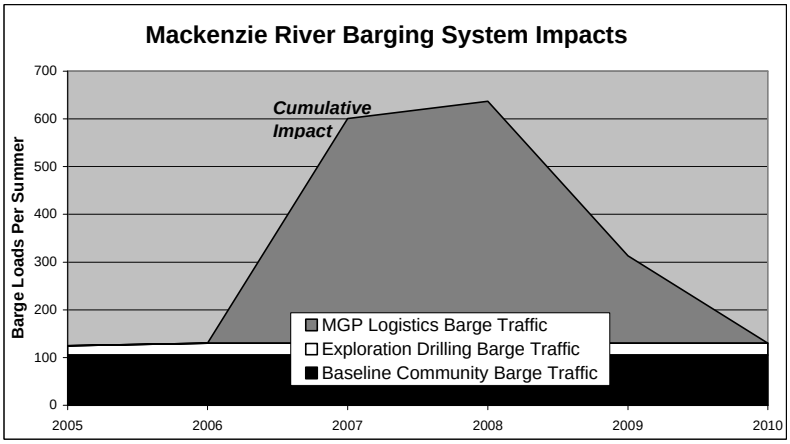


Direct MGP Transportation Impacts at all regional logistics sites over the life of the project are anticipated to total approximately:

- 364,000 Truckloads for Local Supply Gravel Haul and Regional Trucking
- 24,000 Truckloads for Local Stockpile Shuttle Trucking
- 21,000 Bus Passengers and 71,000 Air Passengers

Indirect MGP Transportation Impacts comprise a secondary cascade of supply chain linkages supporting procurement from the south. The map on the following page illustrates peak year combination of indirect transportation impacts leading back from direct transportation impacts at three regions along the Mackenzie Corridor.

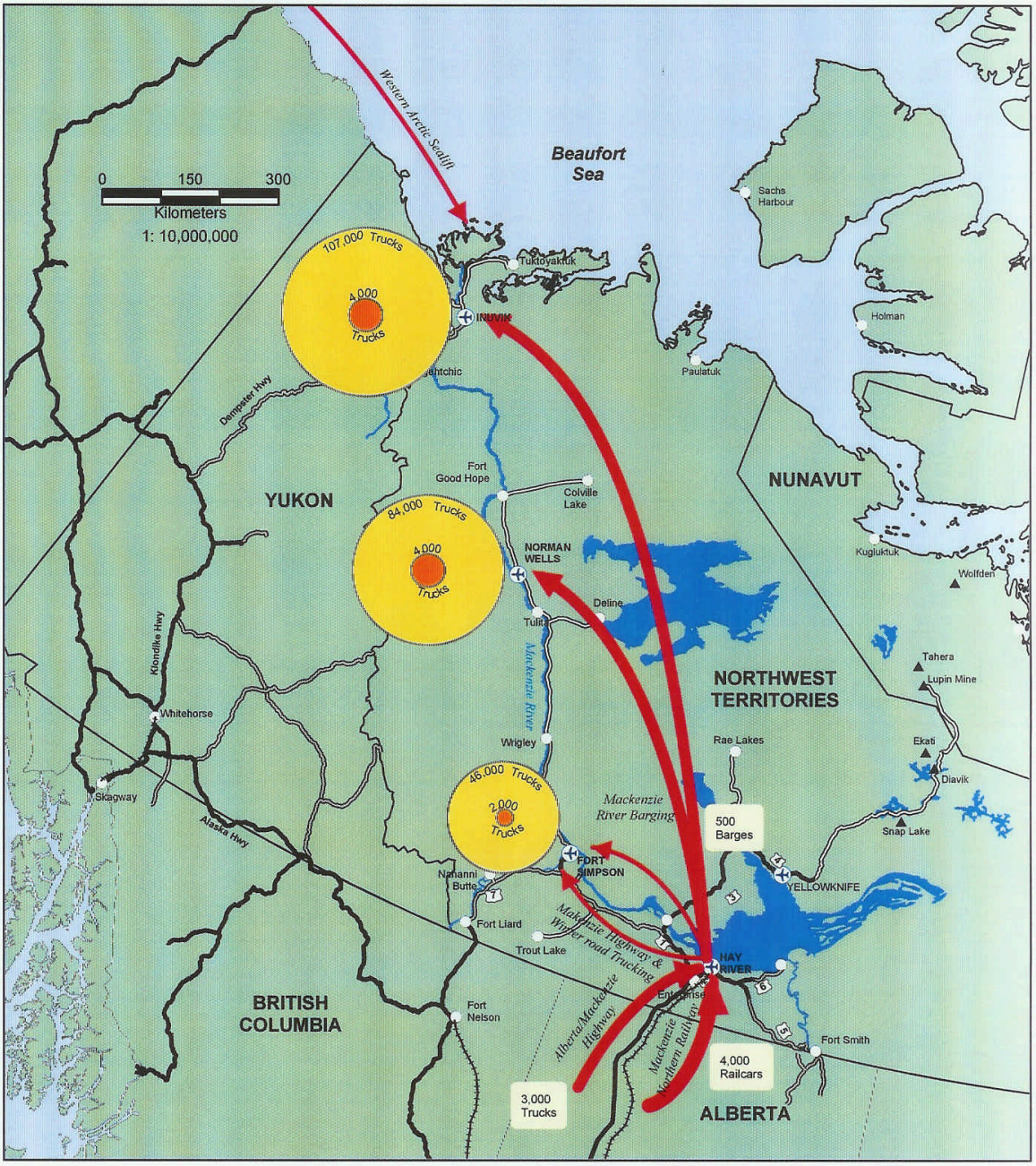
In the Mackenzie Corridor, indirect supply chain linkages include Mackenzie River Barging which must also support MGP stimulated Exploration Drilling as well as ongoing community resupply (see adjacent figure). For Exploration Drilling, an otherwise very substantial 30% increase over baseline community barging requirements becomes insignificant compared to the overwhelming influx of MGP traffic.



The cumulative Pipeline and Drilling Supply impact on top of Baseline Community barging during two peak MGP years will exceed 600 bargeloads, approximately 6 times baseline barge traffic. Short term additions to tug and barge fleet capacity and substantial productivity increases will be required to minimize diversion of some traffic that will inevitably miss the summer window for river transport.

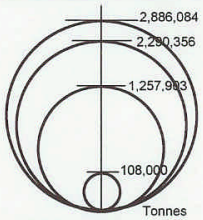
In parallel with Pipeline and Drilling Supply via the Mackenzie Corridor extending northwest from Hay River/Enterprise, Slave Geologic Province Mining Supply relies on a largely winter road corridor extending northeast from Hay River/Enterprise into Nunavut.

Mackenzie Gas Project Transportation Impacts
2007



Inbound Transport (Total: 866,000 Tonnes)

Tonnes	Trucks	Railcars	Barges
< 50,000	<1400	<700	<70
50,000 - 100,000	1400-2800	700-1400	70-130
100,000 - 170,000	2800-4700	1400-2400	130-220
170,000 - 310,000	4700-8600	2400-4400	220-410



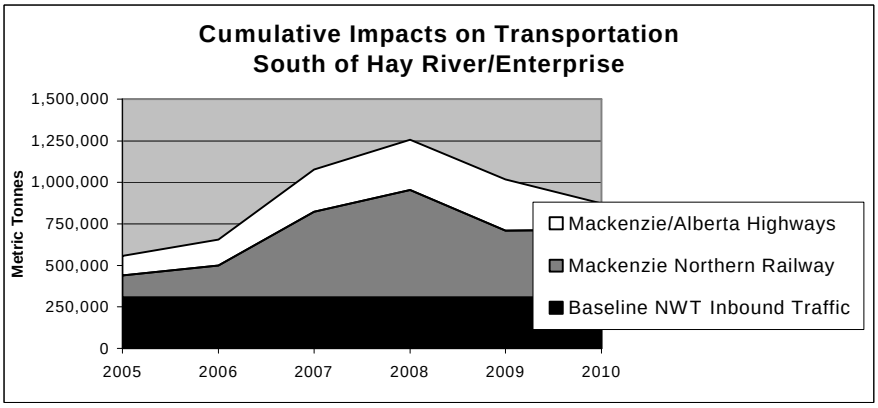
Local/ Gravel Truck Hauls

Stockpile Truck Shuttles

Source: PROLOG Canada Inc., Transport Canada:
Created by: Ping Wang

Cumulative indirect impacts of supply chain linkages to Mackenzie Corridor Gas Projects and Slave Corridor Mining Projects converge at the Hay River/Enterprise Gateway. North of Hay River/Enterprise, the cumulative impact will be mitigated to a large degree by the opposing seasonality and divergent routing of mining winter road traffic that is complementary to MGP summer barge traffic.

South of the Hay River/ Enterprise Gateway, the cumulative indirect impact of rail and truck supply chain extensions are superimposed on Baseline NWT Inbound Traffic in the adjacent figure. By the peak MGP year, Hay River/Enterprise Gateway rail and truck traffic will push up from a baseline of 300,000 tonnes per year to over 1,250,000 tonnes per year - if all projects move ahead as planned.



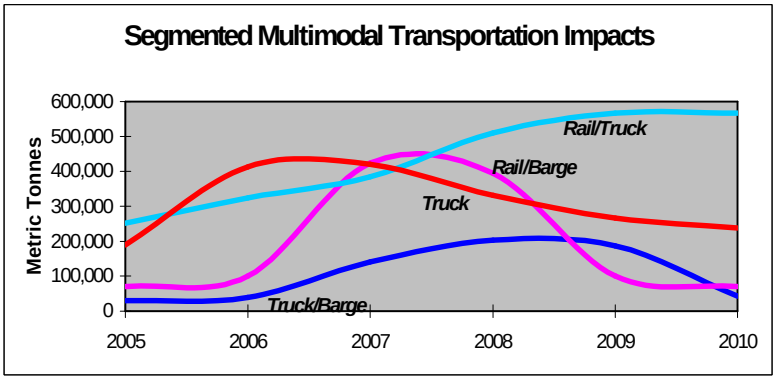
What this means in practical transportation terms is that at peak:

- Over the four month summer shipping season, rail cars and trucks will transfer loads to some 600 barges - an average of 5 barges loaded every day - at Hay River.
- Over a combined winter road (60 day) and summer barge (120 day) season total of 180 days, 7200 project related railcar loads - an average of 40 rail cars every day - will be transferred to trucks or barges at Hay River.
- Over a full year, almost 20,000 truckloads - or 40,000 trucks including empty return - will move through Enterprise either direct to destination, or to Hay River for barge transfers, or from Hay River railcar transfers.

Long haul trucks at Enterprise will *average* 110 per day or one every 13 minutes. Total truck frequency will be much greater than that average during winter road and summer barge seasons. Congestion around Enterprise and Hay River may become intense as local vehicles and long haul trucks compete for the same pavement during those seasonal peaks;

and at Hay River, new investment in rail, barge and truck transfer facilities will be required to maintain tonnage throughput at this potential bottleneck.

Typically, the NWT trade-off in capital investment versus increased maintenance costs has not been a critical issue for the all-weather highway, winter road and connecting rail hauls that are most intensively used to support Slave Corridor Mining Projects in winter when roadbeds are frozen. However, structural degradation can be expected to accompany MGP summer rail and truck traffic peaks.



Both railway and highway reinvestment may be warranted - versus increased annual maintenance that otherwise will be required - where a prolonged increase in the NWT traffic base is forecast beyond the MGP peak. The adjacent figure shows a prolonged impact of through *Truck* and *Rail/Truck* traffic. While barge traffic will likely revert to traditional levels following MGP completion, increasing mining activity is anticipated to sustain through *Truck* traffic at a higher level than pre-MGP and *Rail/Truck* traffic does not decline at all.

In terms of overall capacity to handle the influx of MGP and concurrent project traffic, with exception of the Hay River/Enterprise Gateway, conventional NWT transportation infrastructure can likely accommodate the increased traffic density anticipated without new construction. (Much greater rail, river and highway traffic is routinely carried on similar systems further south).

Unconventional aspects of NWT winter road and river crossing infrastructure may become capacity constrained during the MGP era. River Crossings could require additional winter maintenance and supplemental summer ferry operations (e.g., repositioning of the Fort Providence Ferry following Deh Cho Bridge completion by the middle of the MGP.)

The basic MGP logistics strategy to maximize the economy of high volume, low cost river transportation appears feasible. However, it carries risks that could result in contingent transportation impacts not otherwise considered in this report.

Natural risks range from low water levels reducing barge carrying capacity, to unseasonably warm weather reducing winter road windows, to unseasonably cold weather reducing summer barging seasons. In addition, late deliveries, supplemental purchases, congestion delays, work stoppages and a host of other operational risks separately or in combination could cause seasonal transportation windows to be missed.

Contingent transportation impacts that may be imposed by these risks include:

- Rerouting some barge traffic via the all-weather Mackenzie Highway and winter road to pipeline spreads north of Fort Simpson.
- Rerouting some barge traffic via the all-weather Alaska/Klondike/Dempster Highways and connecting winter roads to Mackenzie Delta pipeline spreads.
- Rerouting some barge traffic to a Fort Nelson railhead via the Liard/Mackenzie Highway connection to barge at Fort Simpson or direct to stockpile sites.

As well, contingent transportation impacts which could be imposed by changes in MGP procurement and logistics strategy include:

- Offshore pipe procurement with delivery via Western Arctic Sealift ocean barge or ship to the Mackenzie Delta.
- Offshore pipe procurement with delivery via ocean barge or ship to Skagway or Haines, Alaska and Dempster Highway haul to the Mackenzie Delta.

These are parallel transportation impacts that accompany contingency planning to assure a viable MGP logistics plan. The multiplicity of parallel contingency options makes it impractical to breakout specific modal impacts in this report. However while these contingency impacts will spread out more widely over other components of the northern transportation system, at the summary level the total transportation impact will not likely change from 1.4 million tonnes throughput anticipated at MGP peak.