Appendix 19


GAS
WATER
POTENTIAL FUTURE SERVICES
PROJECT IRON BOOMERANG CONTINENTAL RAIL CORRIDOR
OPTIC FIBRE
COMMUNICATIONS
PROJECT
IRON BOOMERANG
east west line parks limited

Galilee Infrastructure Corridor Project

Comparative Economic Study

20 December 2012

Introduction

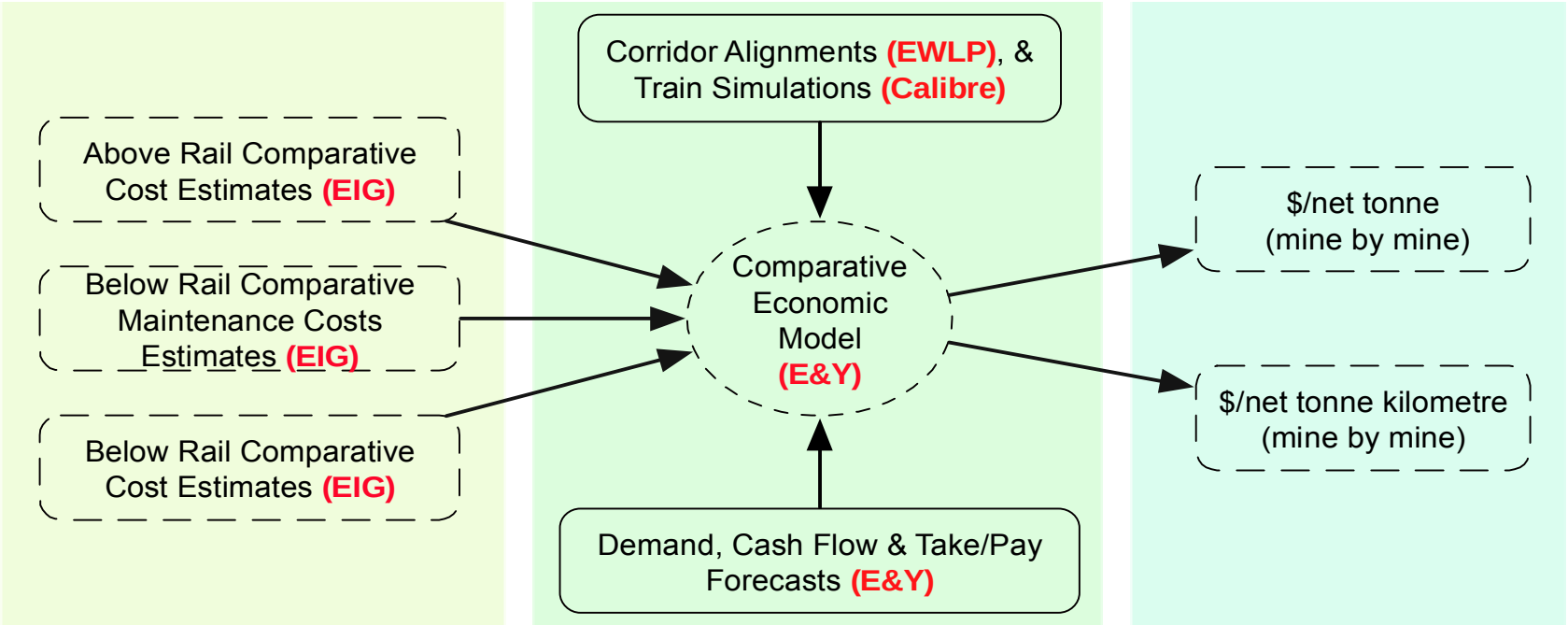
- East West Line Parks Ltd ("**EWLP**") are proposing to develop an open access, multi user, multipurpose infrastructure corridor from the Port of Abbot Point to the coal mining region of the Galilee Basin. The proposed corridor is referred to as the Galilee Infrastructure Corridor Project ("**GICP**").

- EWLP has engaged Everything Infrastructure ("**EIG"**) and Ernst & Young ("**E&Y**") to undertake an economic study, comparing the GICP against other Galilee Basin rail lines.

Economic Study Objective

- The objective of the economic study was to assess and compare the superior freight efficiency, economic benefits and long term sustainability of the GICP.
- GICP was compared against the two rail corridors announced by the Government on 6 June 2012, namely the GVK North South corridor ("GVK") and the QRN East West corridor ("QRN").
- Whilst the study primarily focused on the economic aspects of GICP compared with the other rail corridors, secondary considerations were given to major environmental and community differences between the corridors.

Overview of the Economic Study

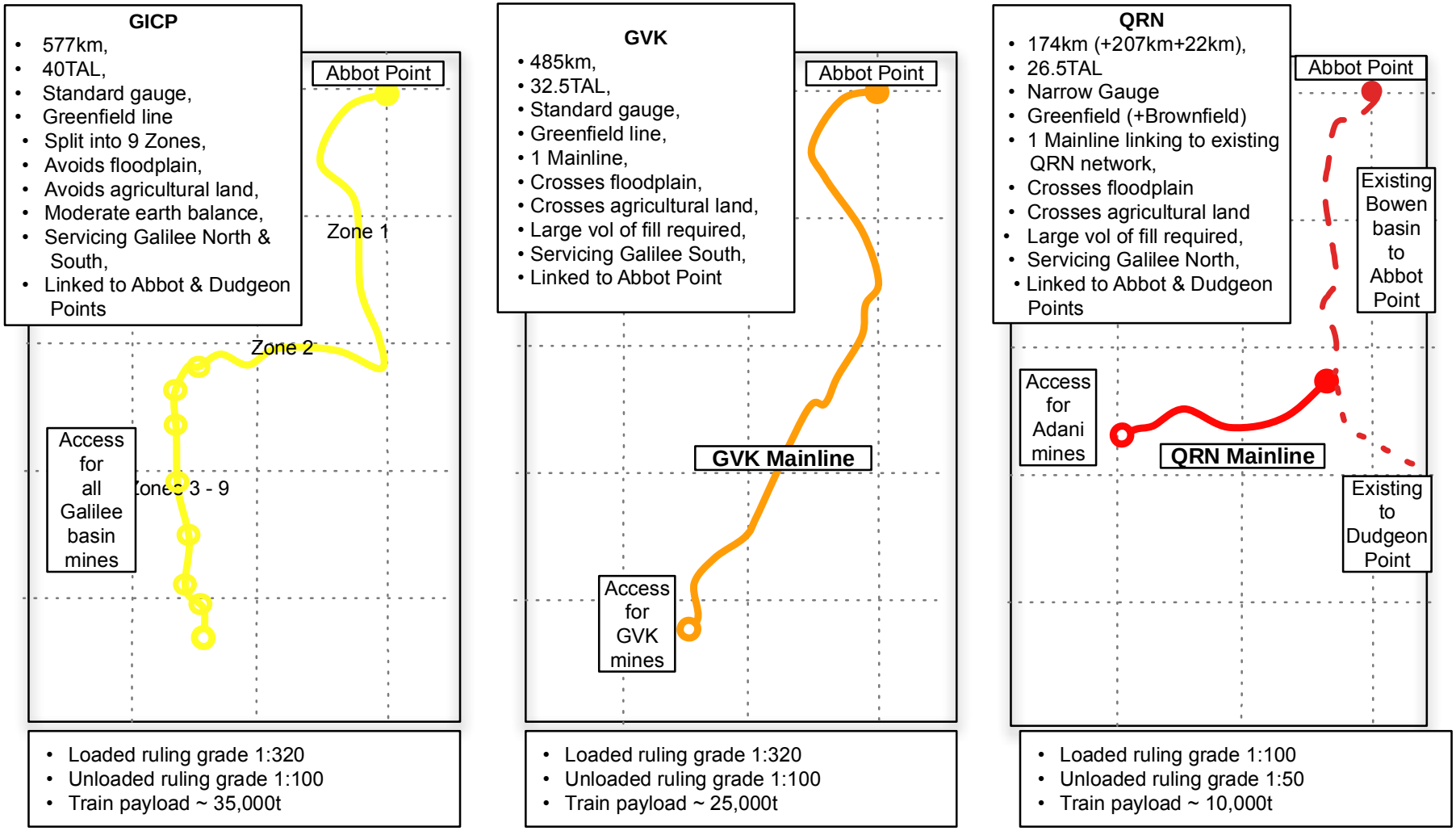


- Input assumptions are consistent with projects in the "Project Identification Phase" as defined by DOTR's "Best Practice Cost Estimation Guide for Rail Construction".

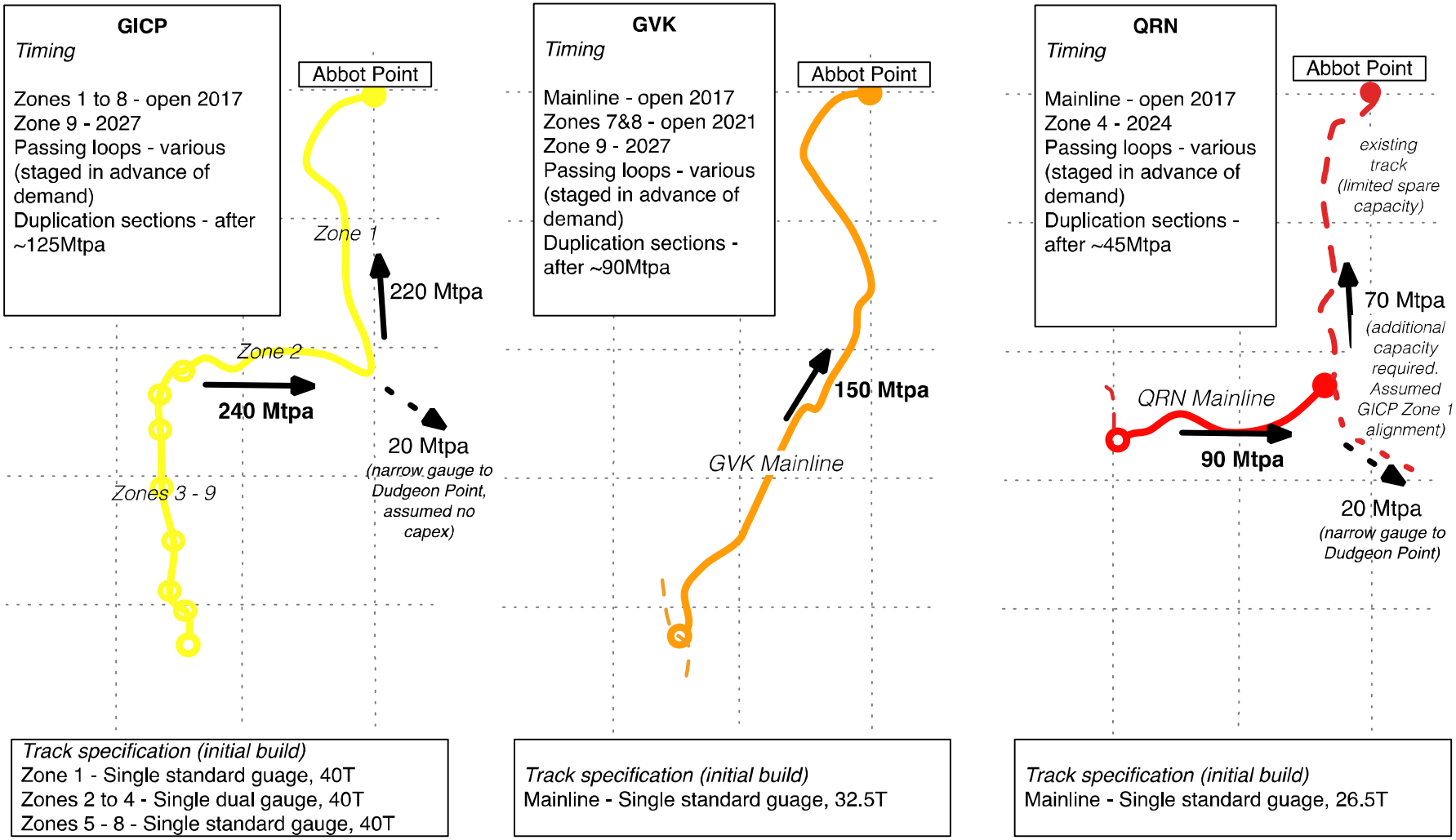
Key Aspects of the Economic Study

- The comparative cost analysis identified qualitative and quantitative differences in the following areas;
  - Alignment and access;
  - Capacity;
  - Below rail elemental costs; and
  - Operating efficiency.

Alignment and Access Related Differences



Capacity Related Differences



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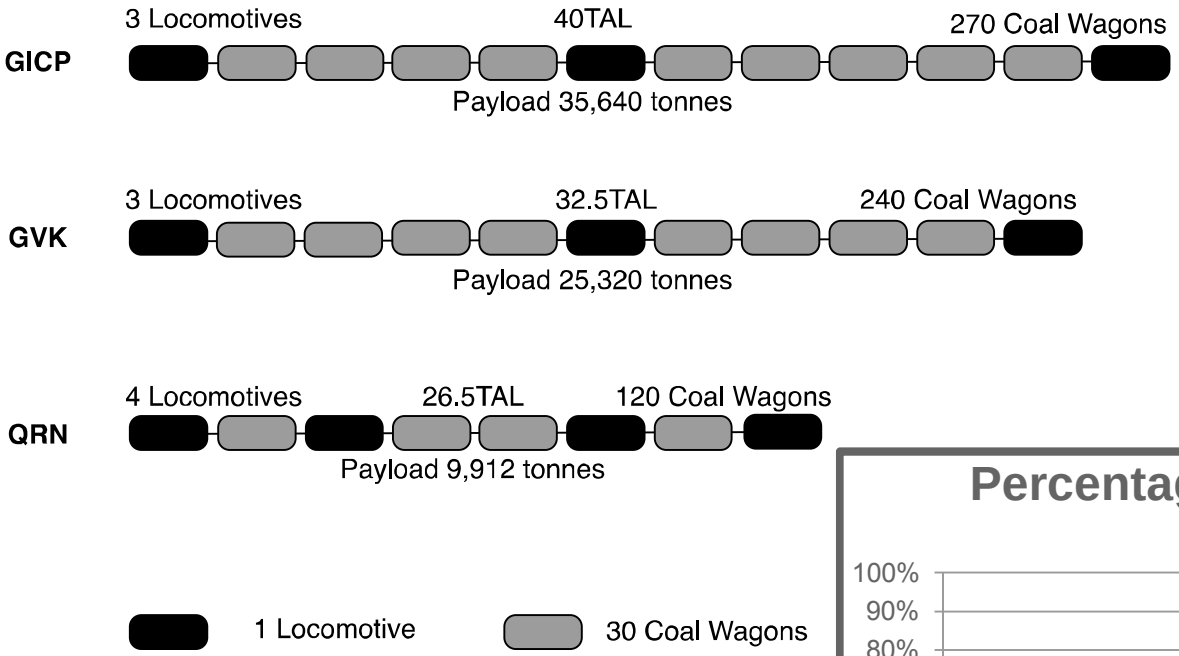
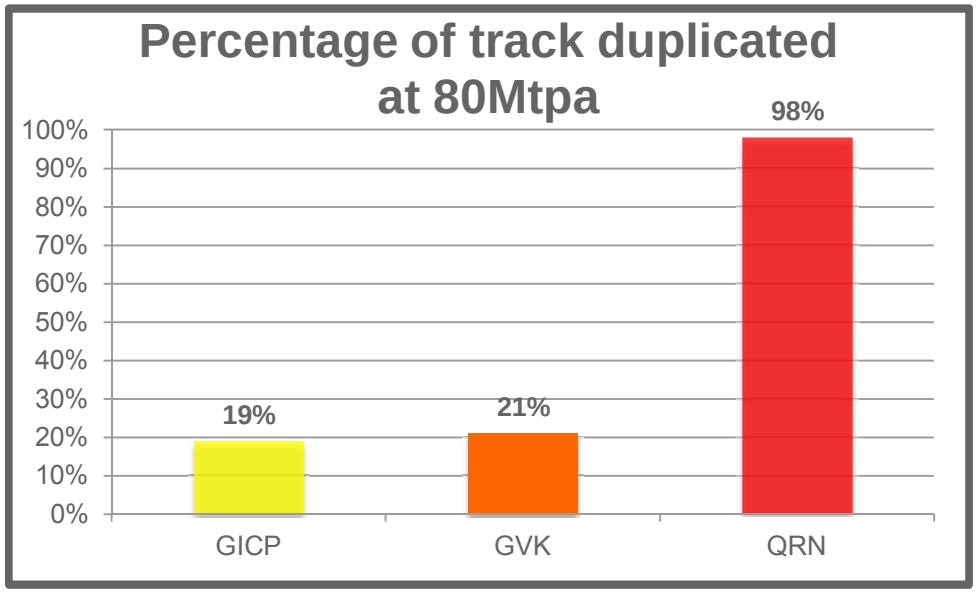




Capacity enhancement steps

a) Single track (greenfield),
b) Passing loops (initial - greenfield),
c) Passing loops (ongoing – brownfield),
d) Duplication sections (brownfield).

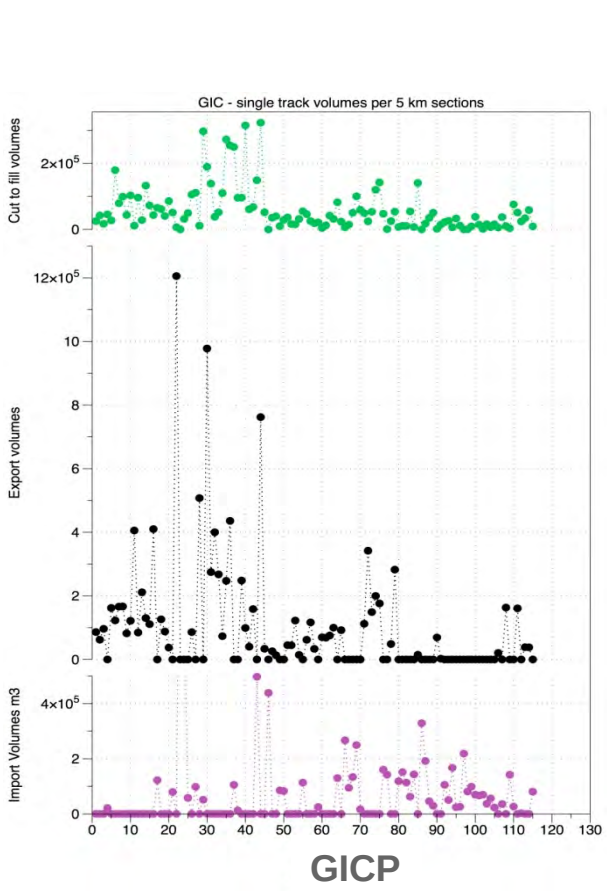
Below Rail Elemental Cost Differences

Cost Structure	Differences	
Direct Costs		
Earthworks	GICP better balance(*)	
Capping Layer	Similar	
Structures	GICP less drainage (**)	
Permanent Way	Standard gauge higher	
Environmental works & Fencing	Similar	
Sub total of Direct Costs		*100%*
Indirect Costs	GICP less exposed to weather	
Total Direct & Indirect Costs		
Contractors margin	Same %	
Total Contractors Price		
Client Cost	Same %	
Land Costs	GIC lower land cost	
Project Contingencies	Same %	
Total Order of Magnitude Estimated Price		*~250%*

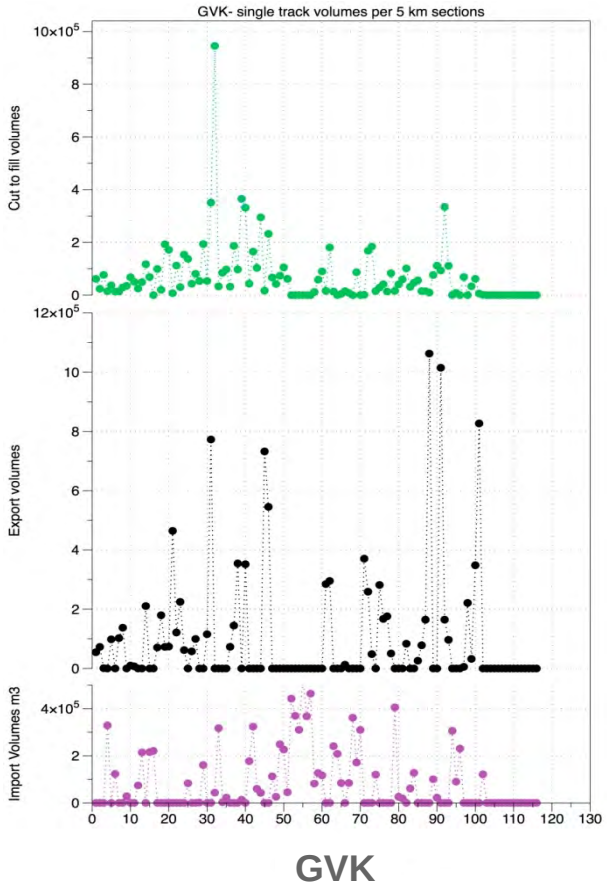
(*) - GICP has more balanced cut to fill earthworks profile resulting in minimum haulage of imported and exported materials;
- GICP alignment minimises crossing of floodplains resulting in less imported fill required for large embankments in flood prone areas;

(**) – GICP alignment would have fewer structures as GICP has lower exposure to flood areas.

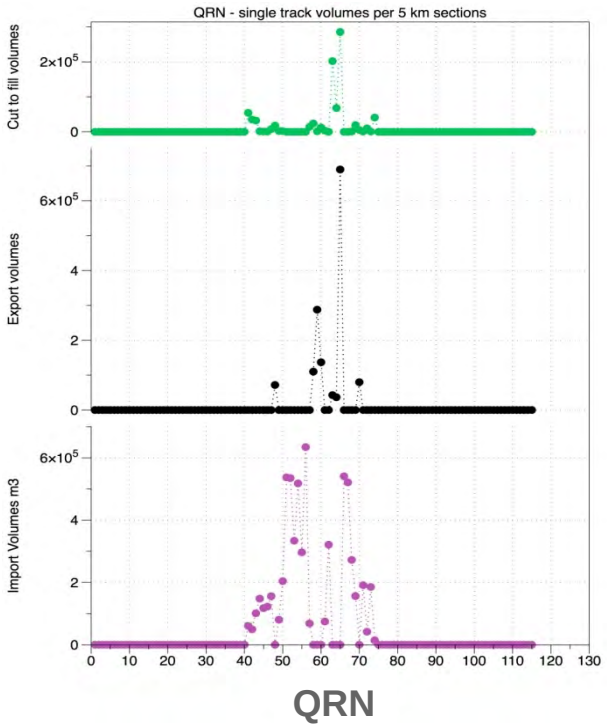
Comparative Earthworks: Indicative cut to fill, export and import volumes (by 5km sections)



GICP



GVK



QRN

- GICP has a reasonable spread of balanced cut to fill earthworks (green);
- GICP major cut areas with large export volumes to be optimised (black);
- GICP has lower imported fill volume (pink).

Below Rail Assumed Terrain Type Distances

Below Rail terrain type kilometres

GICP	Flat	Hilly	Rolling	Flood	Total
Zone 1	20	148	15	36	219
Zone 2	128			23	151
Zone 3			16	12	28
Zone 4		44			44
Zone 5			24	10	34
Zone 6	4			18	22
Zone 7	20			16	36
Zone 8	21			2	23
Zone 9	20				20
Totals	213	192	55	117	**577**

GIC

GVK	Flat	Hilly	Rolling	Flood	Total
Mainline	149	136	20	180	**485**

GVK

QRN	Flat	Hilly	Rolling	Flood	Total
Mainline	75			99	**174**
				Existing network to Abbot Point +22km	229
					403

QRN

- GICP has a longer total distance but has less track in flood prone areas

Below Rail Comparative Direct Cost by Terrain

Below Rail Weighted Average Direct Cost per terrain type (all values are shown in $2012 $m/km*)

GICP(**)	Flat	Hilly	Rolling	Flood	Average
Zone 1	2.5	3.1	2.6	3	3.01
Zone 2	2.3			2.8	2.38
Zone 3			2.4	2.9	2.58
Zone 4		2.6			2.62
Zone 5			2.7	2.9	2.76
Zone 6	2.4			2.9	2.81
Zone 7	2.4			2.9	2.61
Zone 8	2.4			2.9	2.4
Zone 9	2.3				2.31
Overall average					**2.70**

GIC

GVK	Flat	Hilly	Rolling	Flood	Average
Mainline	2.4	3.1	2.6	3.5	**3.00**

GVK

QRN	Flat	Hilly	Rolling	Flood	Average
Mainline	2.4			3.5	**3.00**

QRN

(*) Includes provision for escalation during the construction period
(**) Based on GICP with standard gauge only

- GICP has a lower weighted average cost per kilometre

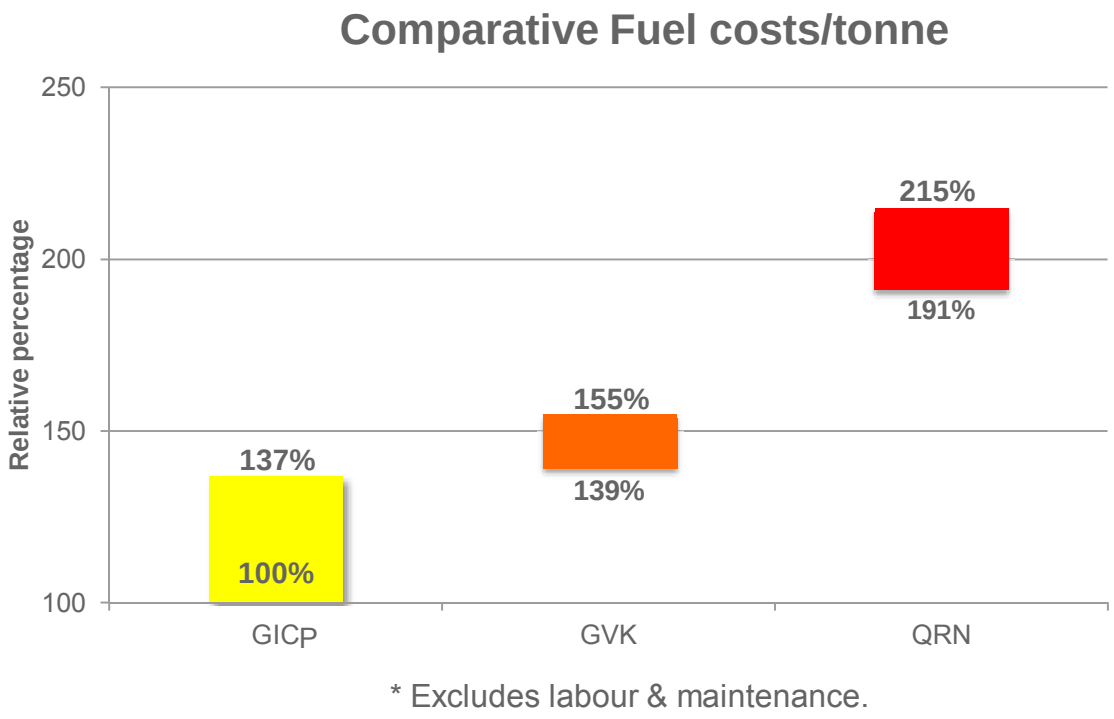
Operating Efficiencies Differences

Infrastructure	Train Configuration	Locomotives	Wagon Tare Mass	Train Payload
GICP 40TAL	3 Locos * 270 Wagons	ES44ACi	26T	35,640(*)
GVK 32.5TAL	3 Locos * 240 Wagons	ES44Aci	20.7T	25,320(**)
QRN 26.5TAL	4 Locos * 120 Wagons	GT42CU AC	19.4T	9,912(***)

Note: (*) :(160 -26 – 2) * 270 = 35,640, (**) : (130 -20.7 – 2 - 2) * 240 = 25,320, , (***) : (106 -19.4 – 2 - 2) * 120 = 9,912

Note(1): Assuming the theoretical performance of 40TAL wagon,

Note(2): Assuming GICP 9% fuel saving for lidded wagons,



* Excludes labour & maintenance.

Comparative Differences Overview

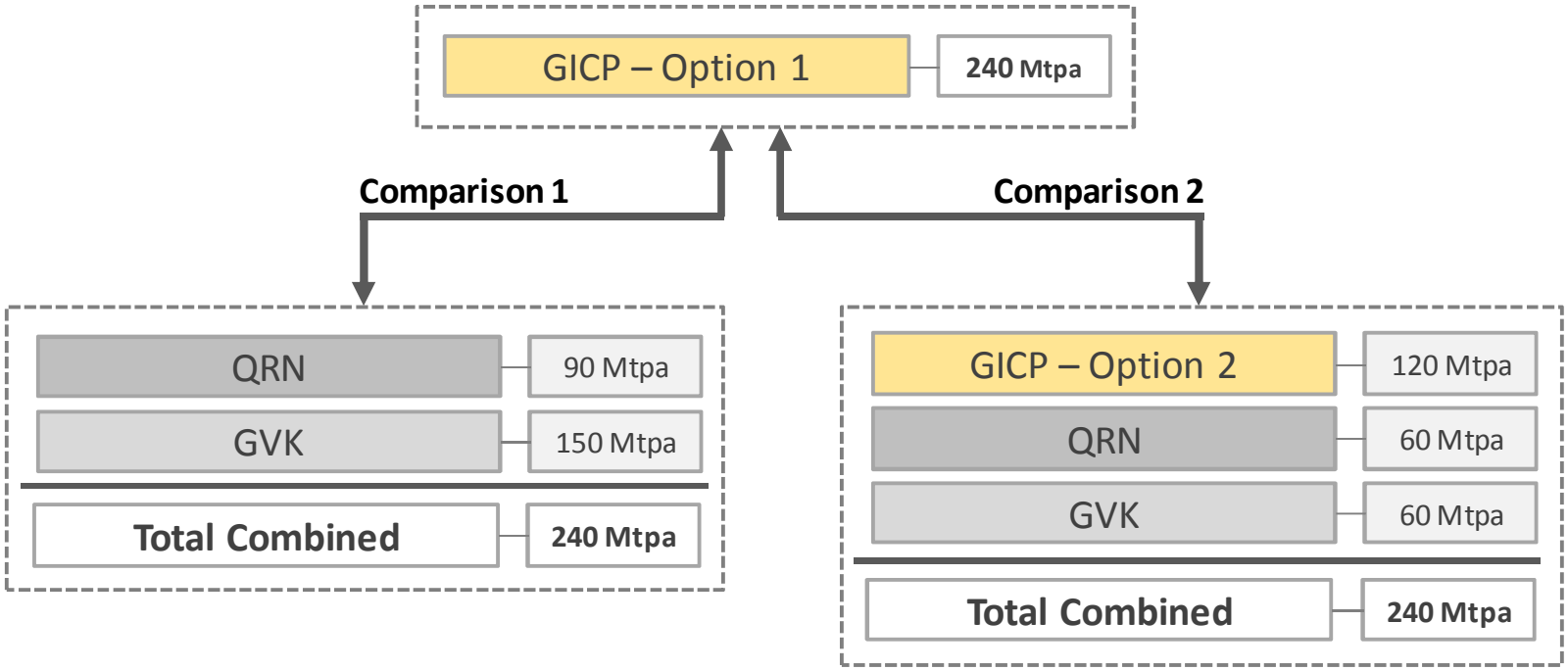
	GICP	GVK	QRN
Alignment Efficiencies	Balanced Earthworks	Imported Fill, Drainage Structures	Imported Fill, Drainage Structures
Capacity Enhancement	Economies of scale with 40TAL wagon, on standard gauge	Similar to GIC but with reduced payload	Restricted by existing QRN network, Require major capacity upgrades to meet demand
Access Characteristics	Located to service Galilee North & South	Galilee South focused	Galilee North focused
Below Rail Comparative Costs	Less direct cost/km	Additional bridges & culverts in floodplain areas	Additional bridges & culverts in floodplain areas
Operating Efficiencies	Opex Cost / Tonne 100% ~ 145%	Opex Cost / Tonne 149% ~ 167%	Opex Cost / Tonne 220% ~ 252%

Approach to Financial Assessment

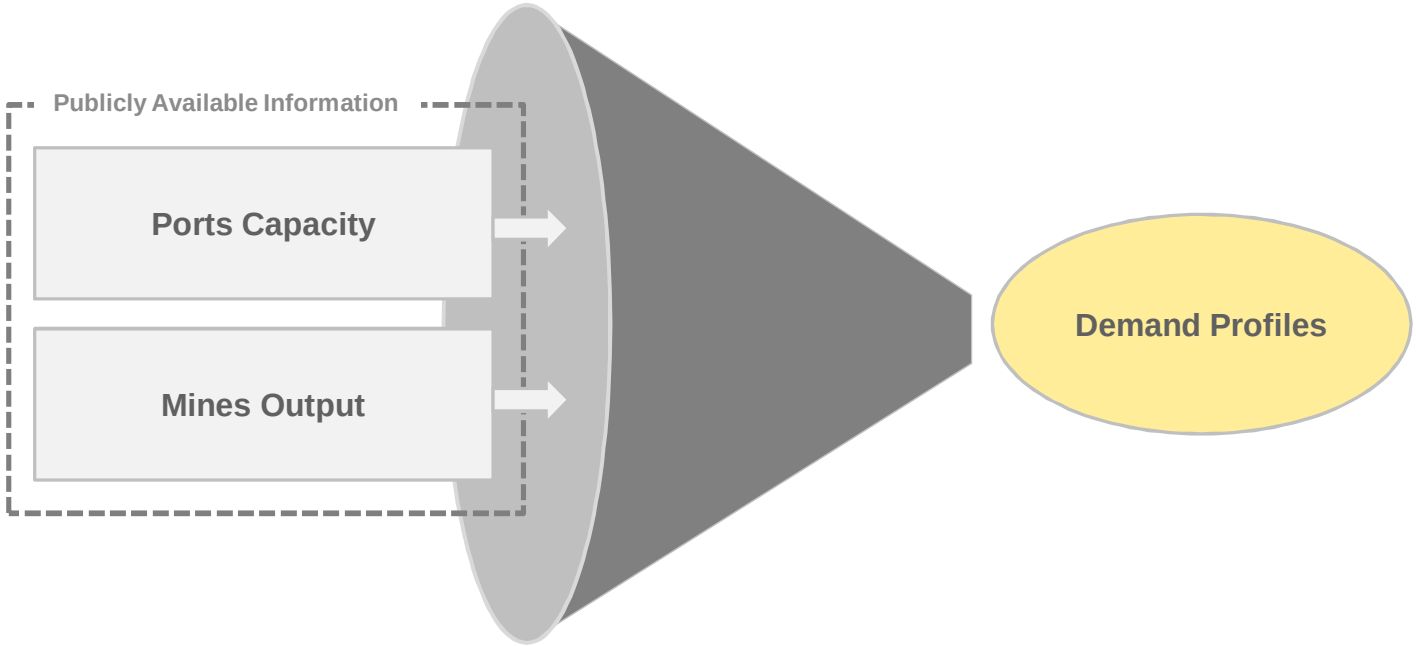
- Government's announcements on 6 June 2012 supports two rail corridors:
  - QRN East-West corridor
  - GVK North-South corridor

- Focus on comparing GICP solution against alternative multi-alignment solutions:
  - **Comparison 1** - Identify the financial benefits associate with the GICP single alignment solution over a multiple alignment solution serviced by QRN and GVK.
  - **Comparison 2** - Assess the financial benefits available to miners of a smaller scale GICP solution where the solutions proposed for QRN and GVK also exist.

Definition of Comparisons

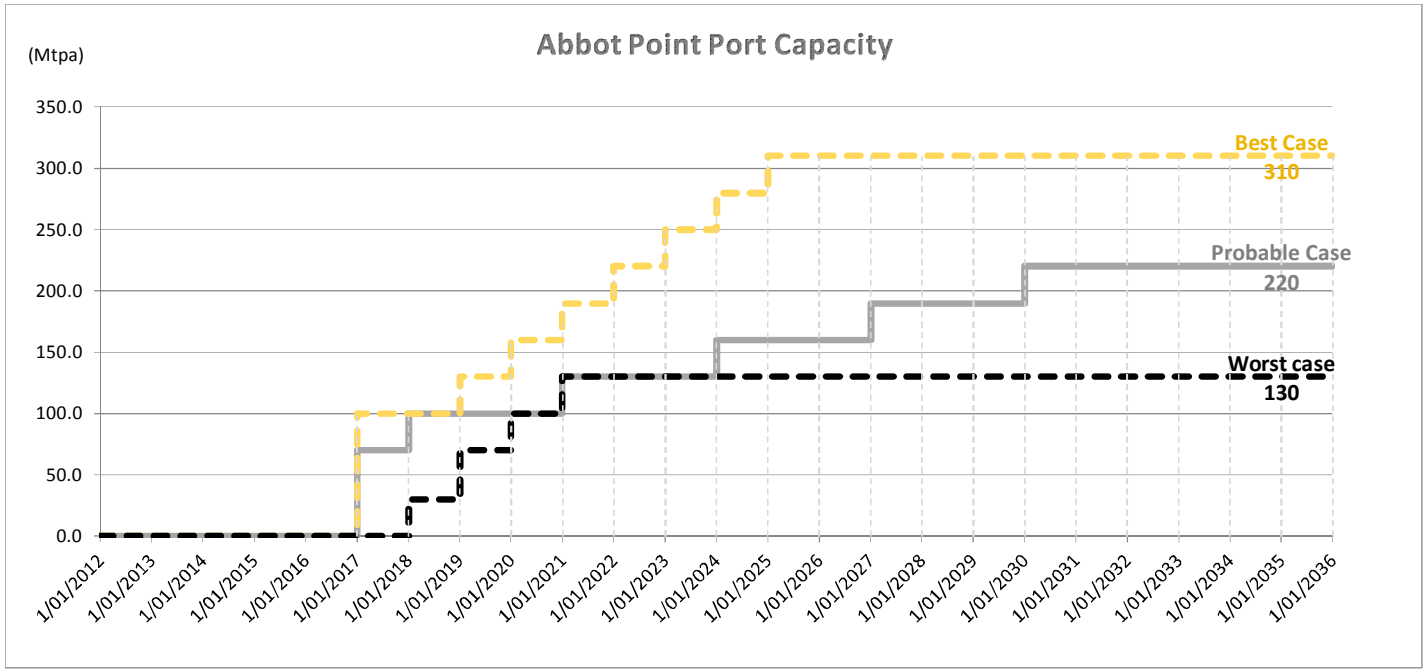


Demand Profile Methodology



Port Capacity Assumptions

- Abbot Point Port Capacity (assumed for Galilee coal)

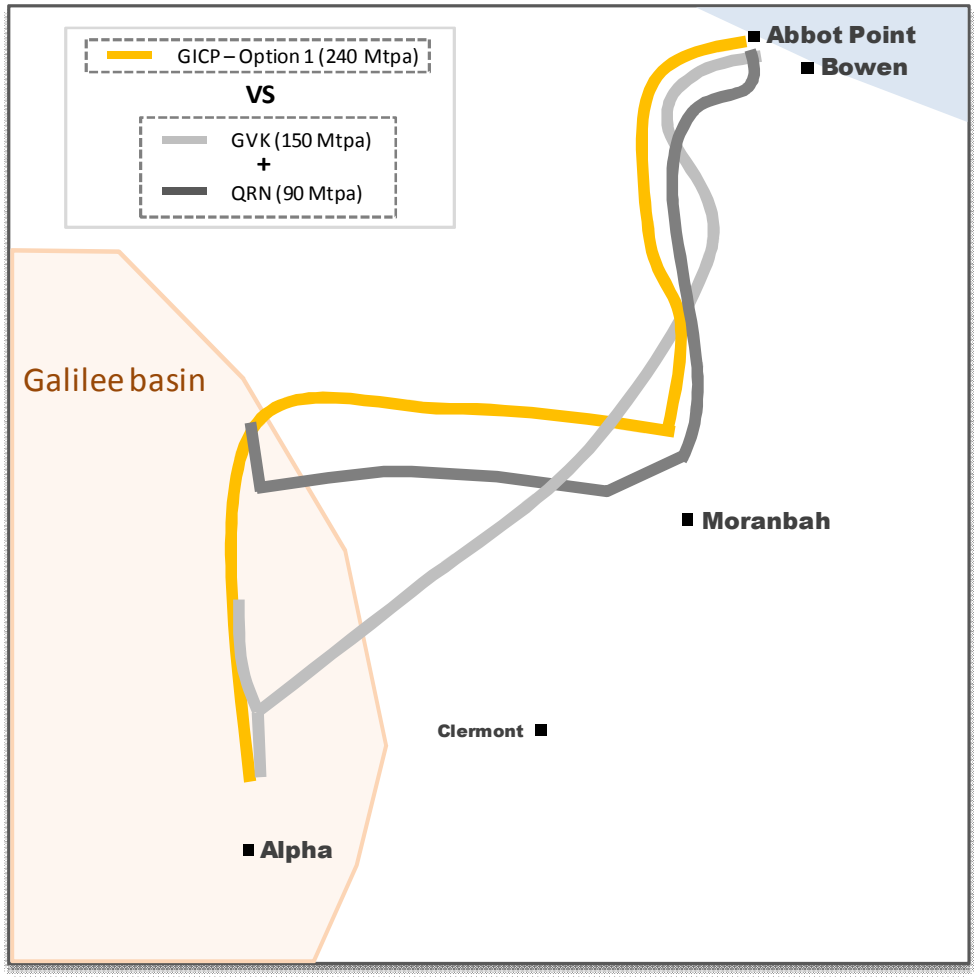


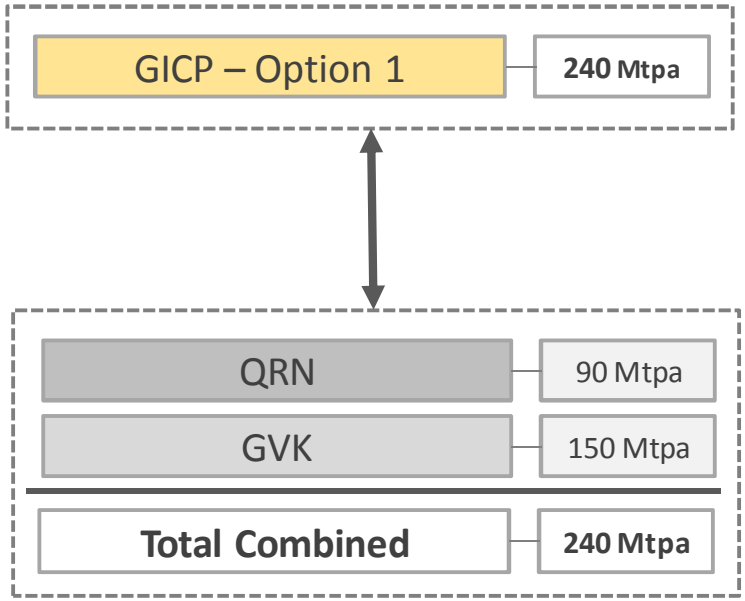
- Dudgeon Point Port Capacity: 20Mtpa for Adani

Mines Output Assumptions

Project name	Proponent	Range of publicly available volumes (Mtpa)	Volumes assumed for analysis (Mtpa)	Operational readiness
South Galilee Coal Project	AMCI & Bandanna Energy Ltd	15-20	15	2015
China First Coal Project	Waratah	40	40	2014
Alpha Coal Project	Hancock / GVK	30	30	Q2 2015
Alpha West Project	Hancock / GVK	16-24	16	2016
Kevin's Corner Project	GVK	30	30	Q4 2015
Alpha North Coal Project	Waratah	40	40	Q4 2016
Alpha West Coal Project	Waratah	No details	-	No details
Degulla Coal Project	Vale	20-40	20	Unknown 2016 assumed for purpose of study
Carmichael East Coal Project	Waratah	No details	-	No details
Carmichael Coal Project	Adani	60 (from 2022)	60	2014
China Stone Project - South	Macmines	30	30	2016
China Stone Project – North	Macmines	30	30	No details 2016 assumed for purpose of study
Total Galilee Basin		311-344	311	

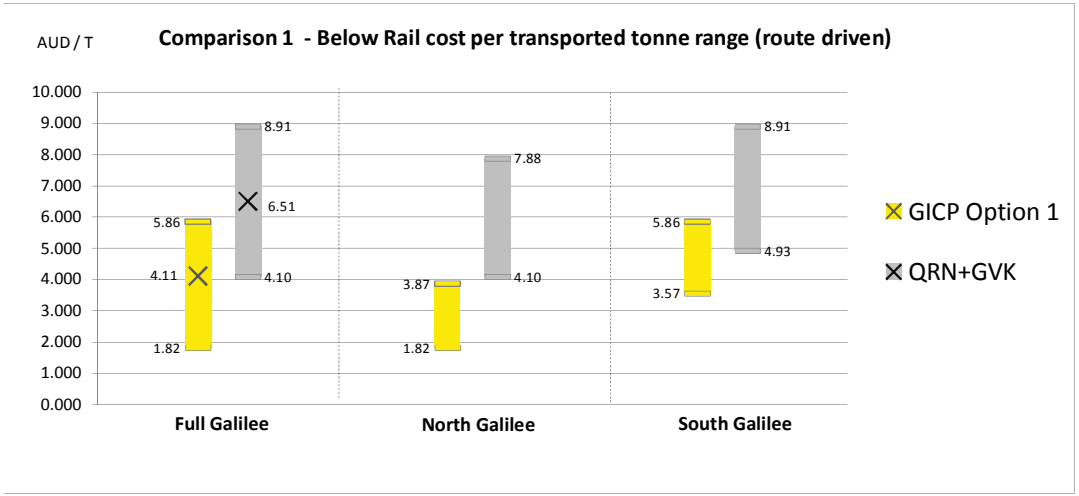
Comparison 1

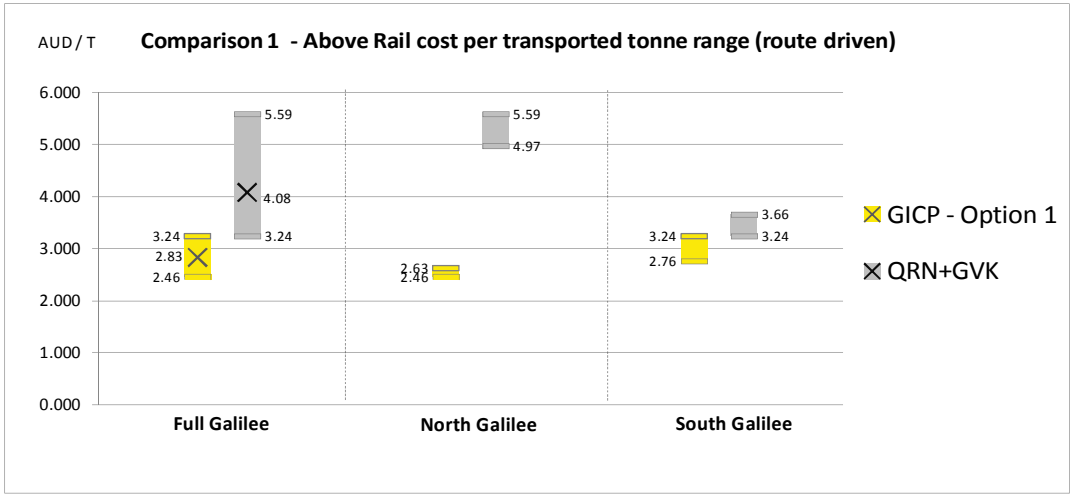




This is an Ernst & Young graphical representation of alignment for information purposes and is not to scale.

Comparison 1 – Financial Results





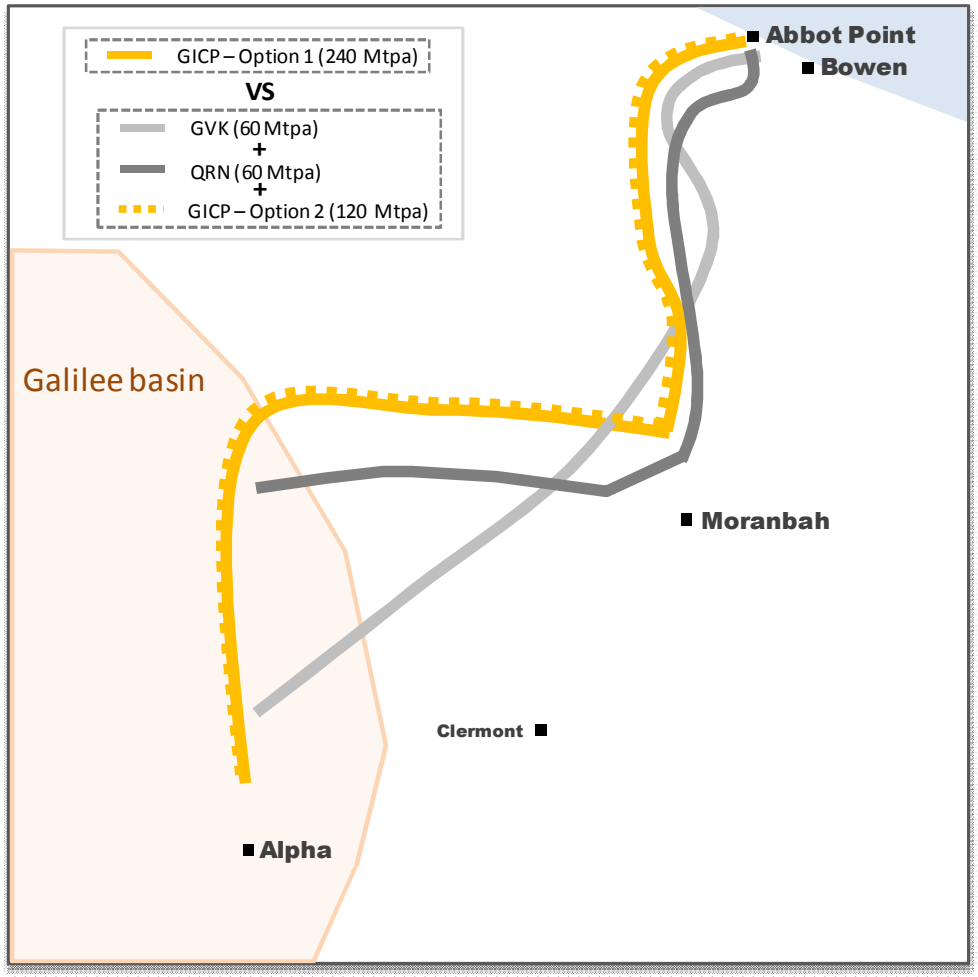
Comparison 1 – Financial Results

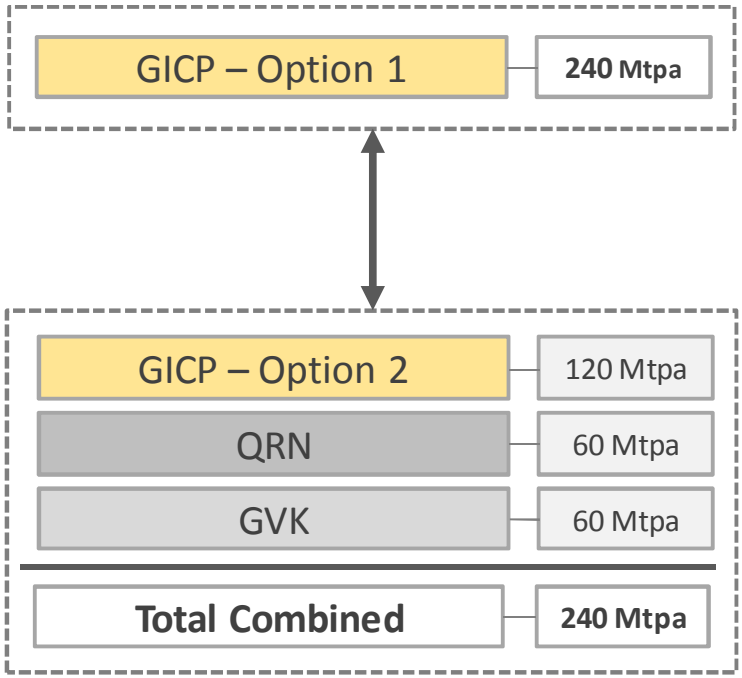
- GICP 240Mtpa single alignment solution appears to offer a 50% to 55% lower cost per tonne, in the region of AUD7.00, than a combined QRN (90Mtpa) and GVK (150Mtpa) solution
- This is driven by efficiencies from:
  - **Below Rail**: The lower cost of building one below rail alignment compared to the cost of building two alignments. The GICP option 1 construction cost is around AUD6.1bn* in 2012 prices, a saving in the region of 70% to 75% over the combined alternative solution.
  - **Above Rail**: The standard gauge, 40 tonne axle load, above rail solution proposed for GICP is estimated to be in the range of 15% to 20% more cost efficient than the proponent GVK, standard gauge, 32.5 tonne axle load solution and approximately 80% more efficient than the proponent QRN, narrow gauge, 26.5 tonne axle load solution

* Construction cost of **AUD6.1bn = (A) - (B) + (C)**

- **(A)** = AUD3.9bn for Below Rail single line and single gauge costs, including provision for inflation during construction (ie. 577km x AUDm2.7/km x 250%)
- **(B)** = AUD0.2bn for removal of provision for indexation during construction
- **(C)** = AUD2.4bn for dual gauge, passing loops and duplication

Comparison 2





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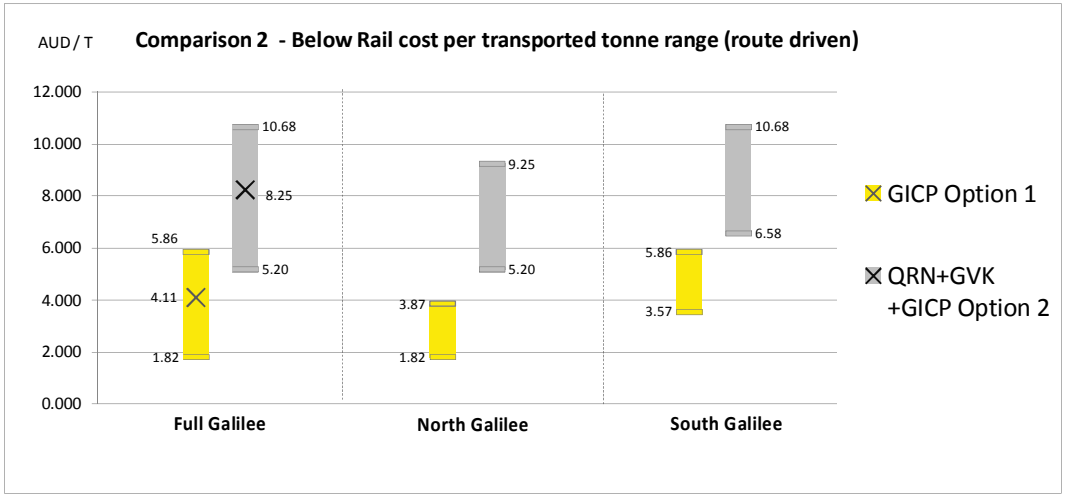
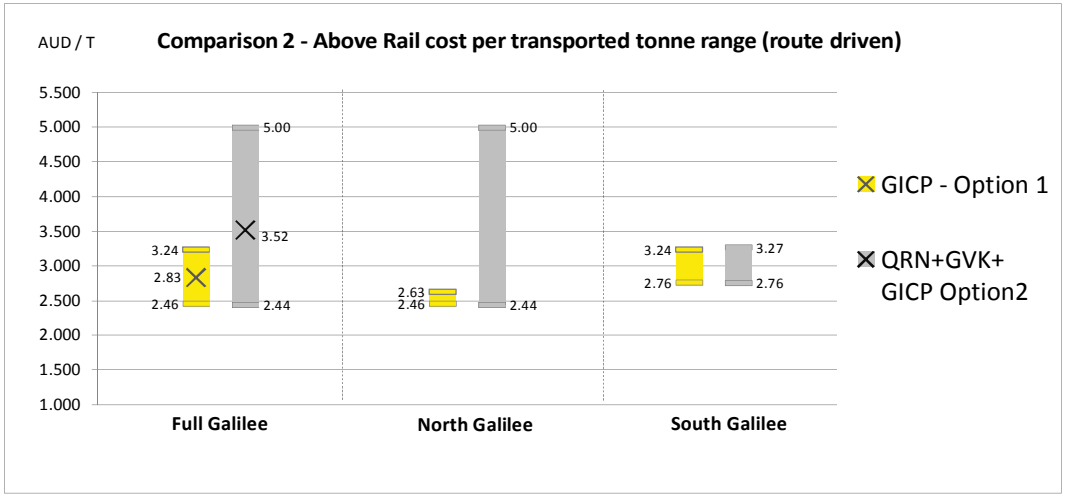
Comparison 2 – Financial Results





Comparison 2 – Financial Results

- GICP Option 1 (240Mtpa) appears to be in the region of 65% to 70% more efficient, on a cost per tonne basis, than the combined three alignment solution
- At around AUD10.00 the GICP Option 2 (120Mtpa) cost per tonne is in the range of 25% to 40% lower than the QRN (60Mtpa) and GVK (60Mtpa) components of Comparison 2. This is a positive indicator of the potential of the GICP's performance at lower volumes, however, further assessment was required as in this comparison the different alignments service different mines.
- The potential of the GICP Option 2 (120Mtpa) was explored further by assessing the options available to each mine for getting to the port. This involved assessing the GICP Option 2 outputs against the QRN (90Mtpa) and GVK (150Mtpa) solution explored under Comparison 1.
  - At a system level, the cost per tonne of around AUD10.00 for GICP Option 2 (120Mtpa) compares favourably against approximately AUD10.60 for the combined QRN (90Mtpa) and GVK (150Mtpa) solution. Again indicating the potential of the lower volume GICP solution.
  - When assessed at a mine level:
    - Macmines South – The GICP Option 2 solution, at AUD9.80, indicates a cost per tonne benefit of AUD3.70 over the QRN (90Mtpa) alternative. The above rail solution provided AUD3.20 of this benefit, however, the below rail solution also performed favourably.
    - Vale - The GICP Option 2 solution appears to offer a benefit over the GVK (150Mtpa) solutions of around 20% to 25%, AUD0.90 above rail and AUD1.50 below rail.
    - Waratah – The GVK (150Mtpa) solution outperformed the GICP Option 2 (120Mtpa) solution by between 10% and 20% for the various Waratah mines serviced. However, the Waratah mines could also benefit if higher volumes are achieved on the GICP alignment.
  - A consistent message across all mines was the importance of the GICP above rail solution. At a system level, the cost per tonne is 40% to 50% lower than the combined alternative solution.

Sensitivities

- QCA Regulated return on Below Rail (Comparison 1)
  - Key messages do not change
- Port Capacity – Best + Worst Case (Comparison 1)
  - Range of prices increase in line with expectation
- Port Access (Comparison 2)
  - Cost per tonne falls reflecting better asset utilisation
  - GICP option 1 cost per tonne remains lower by 50% to 60%
- Theoretical Direct Comparison against QRN
  - GICP solution appears to offers lower cost per tonne for Adani mine, driven by above rail (50% of QRN cost). Alignment also likely to benefit Macmines.
- Theoretical Direct Comparison against GVK
  - GICP and GVK solutions appear to offer similar cost per tonne. Alignment of GICP favourable for mines north of GVK alignment.

Conclusions

On preliminary assessment:

- The single alignment GICP solution, at around AUD 7.00 per tonne, indicates 50% to 55% financial efficiency against the alternative dual alignment solution.
- If more than one alignment is developed:
  - The GICP solution indicated financial benefits, on a cost per tonne basis, for the Vale, Macmines and Adani mines
  - Waratah mines could also benefit if higher volumes are achieved
- The above rail analysis indicates that, on a cost per tonne basis:
  - Standard Gauge performs more efficiently than Narrow Gauge
  - Subject to further validation of wagon design, a 40 tonne axle load wagon outperforms 32.5 and 26.5 tonne axle load wagons
- GICP achieves major environmental and community benefits by:
  - Bypassing community areas
  - Minimising impact on agricultural land
  - Minimising the length of corridor in flood plain areas

Next Steps

- **Initial Steps**
  - Engage the mining community and testing of demand assumptions
  - Engage NQBP, as the Abbot Point port owner, to market test the port capacity strategy
  - Based on feedback from above steps, validate and/or revise analysis
  - Re-engage the mining community and port owners for support
- **Future Steps**
  - In conjunction with miners, raise the profile and visibility of GICP with the State Government
  - Develop the financing structure and engage the financial market
  - Expand on the community and environmental benefits