DOCUMENT 4

COSTS OF CORRECTIVE MEASURES AND DOUBLE TRACKING DUE TO IMPACTS OF THIRD PARTY ACCESS ON THE MT NEWMAN SYSTEM

1. ISSUES

1.1 BHPBIO has asked TSG to undertake simulation modelling to estimate the level of impact upon BHPBIO's iron ore operations, at two different levels of third party operator usage of the Mt Newman Line, and to identify measures that must be undertaken in order to ameliorate that impact (see Document 3). BHPBIO has subsequently estimated the capital costs of implementing the corrective measures identified by TSG.

1.2 Further, BHPBIO has estimated the costs of fully double tracking the Mt Newman Line so as to maximise the capacity of that railway line.

2. COST OF CORRECTIVE MEASURES

2.1 The modelling work undertaken by TSG considered the level of impact upon BHPBIO's iron ore operations at two different levels of third party usage of the Mt Newman Line based on two models of FMG's train performance (scenarios B1, B2, D1 and D2). Those scenarios are:

CASE	BHPBIO USE	THIRD PARTY USE	FMG TRAINS	CORRECTIVE MEASURES
A	RGP3 (129mtpa)	None-	-	-
B1	RGP3 (129mtpa)	FMG (45mtpa from Cloud Break)	Same as BHPBIO	**C1**
B2	RGP3 (129mtpa)	FMG (45mtpa from Cloud Break)	20% poorer than BHPBIO	**C2**
D1	RGP3 (129mtpa)	FMG (10mtpa from Mindy Mindy)	Same as BHPBIO	**E1**
D2	RGP3 (129mtpa)	FMG (10mtpa from Mindy Mindy)	20% poorer than	**E2**

Scenario B1

2.2 The TSG study found that if FMG were to use the Mt Newman Service (and the Goldsworthy Line[1]) to transport 45mtpa of iron ore from its Chichester Ranges deposits to the Anderson Point turnout, then there would be an average track delay per cycle for BHPBIO trains of 3.14 hours and total delays on track for BHPBIO trains of 12,105 hours per annum. The average track delays per cycle for BHPBIO trains would increase by

[1] The assumption underlying this usage is that FMG would have access to the Goldsworthy Line from the junction with the Mt Newman Line to Anderson Point. Note though, that this is not realistic, in that a rail track service on the Goldsworthy Line cannot be declared under Part IIIA. However, the assumption has been made in order to provide a practical context for the remainder of this modelling work.

approximately 47 minutes or around 33%. In order to offset the impact of third party access – that is, to reduce the average track delays per cycle to within 5% of the levels applicable without any third party access to the Mt Newman Line – 136 km of double tracking would be required from between the Mooka and Garden sidings[2]. The estimated cost of this double tracking, as calculated below, is **$576.7m**:

	Distance – excluding sidings (km)	Cost per km (A$m/km)	Approximate Cost (A$m)
Mooka to Walla	20.28	3.0	60.8
Walla to Abydos	60.61	2.7	163.6
Abydos to Spring	37.09	2.6	96.4
Spring to Garden	17.66	2.6	45.9
Bridges			210.0
Total	**135.64**		**576.7**

Scenario B2

2.3 The TSG study found that if FMG were to use the Mt Newman Service (and the Goldsworthy Line) to transport 45mtpa of iron ore from its Chichester Ranges deposits to the Anderson Point turnout, and assuming that FMG train performance is 20% poorer than BHPBIO trains, then there would be an average track delay per cycle for BHPBIO trains of 3.68 hours and total delays on track for BHPBIO trains of 14,067 hours per annum. The average track delays per cycle for BHPBIO trains would increase by approximately 79 minutes or around 56%. In order to offset the impact of third party access and reduce the average track delays per cycle to within 5% of the levels applicable without any third party access to the Mt Newman Line, 152 km of double tracking would be required from between Bing and Shaw. The estimated cost of this double tracking is **$640.0m** as below:

	Distance – excluding sidings (km)	Cost per km (A$m/km)	Approximate Cost (A$m)
Bing to Mooka	9.71	3.0	29.1
Mooka to Walla	20.28	3.0	60.8
Walla to Abydos	60.61	2.7	163.6

[2] The sections to be double-tracked in this scenario, and in each of the other scenarios considered in this paper, have been selected by TSG on the basis of seeking to double track those areas of the Mt Newman Line that are likely to attract the greatest delays on track (ie. the most number of meets or other on-track delays) under post RGP3 conditions. See Document 3.

Abydos to Spring	37.09	2.6	96.4
Spring to Garden	17.66	2.6	45.9
Garden to Shaw	6.32	5.4	34.1
Bridges			210.0
Total	**151.67**		**640.0**

Scenario D1

2.4 The TSG study found that if FMG were to use the Mt Newman Service (and the Goldsworthy Line) to transport to transport 10mtpa of iron ore from Mindy Mindy to the Anderson Point turnout then there would be an average track delay per cycle for BHPBIO trains of 2.77 hours and total delays on track for BHPBIO trains of 10,748 hours per annum. The average track delays per cycle for BHPBIO trains would increase by approximately 25 minutes or around 17%. In order to offset the impact of third party access and reduce the average track delays per cycle to within 2% of the levels applicable without any third party access to the Mt Newman Line, 44 km of double tracking would be required from between Garden and Gidgi. The estimated cost of this double tracking is **$187.2m** as below:

	Distance – excluding sidings (km)	**Cost per km (A$m/km)**	**Approximate Cost (A$m)**
Garden to Shaw	6.32	5.4	34.1
Shaw to Hesta	10.08	4.1	41.3
Hesta to Cowra	15.15	4.1	62.1
Cowra to Gidgi	12.11	4.1	49.7
Total	**43.66**		**187.2**

Scenario D2

2.5 The TSG study found that if FMG were to use the Mt Newman Service (and the Goldsworthy Line) to transport to transport 10mtpa of iron ore from Mindy Mindy to the Anderson Point turnout, and assuming that FMG train performance is 20% poorer than BHPBIO trains, then there would be an average track delay per cycle for BHPBIO trains of 2.99 hours and total delays on track for BHPBIO trains of 11,529 hours per annum. The average track delays per cycle for BHPBIO trains would increase by approximately 38 minutes or around 27%. In order to offset the impact of third party access and reduce the average track delays per cycle to within 2% of the levels applicable without any third party access to the Mt Newman Line, 66.5 km of double tracking would be required from between Spring and Yandi Junction. The estimated cost of this double tracking is **$298.7m** as below:

	Distance – excluding sidings (km)	Cost per km (A$m/km)	Approximate Cost (A$m)
Spring to Garden	17.66	2.6	45.9
Garden to Shaw	6.32	5.4	34.1
Shaw to Hesta	10.08	4.1	41.3
Hesta to Cowra	15.15	4.1	62.1
Cowra to Gidgi	12.11	4.1	49.7
Gidgi to Yandi Junction	5.15	4.1	21.1
Bridge – Spring to Garden			44.5
Total	**66.47**		**298.7**

3. ACTUAL COSTS MAY BE HIGHER AND OTHER ISSUES

3.1 The capital costs of implementing these corrective measures may be substantially higher than the above estimates. In the B1 and B2 scenarios, concerning the use of the Mt Newman Line by FMG for running trains to transport ore from Cloud Break, the corrective measures required are uncertain due to the following factors:

(a) The stochastic nature of the simulation analysis combined with the integer nature of adding whole sections of double tracking between the existing passing sidings, resulted in the simulated fixes being within +/- 5% of the performance of the base case.

(b) All the simulated fixes were confined to the Mt Newman Line. Analysis showed that under **predicted** performance measures, the small section of the Goldsworthy line could handle the increased traffic. There is a real risk, however, that this would not be achieved, thereby requiring double tracking of that Goldsworthy segment. This is particularly due to the physical layout of the Mt Newman and Goldsworthy systems and in particular to the location and nature of the sidings at Bing and Boodarie that play a crucial role in minimising delays at the port.[3]

(c) In some cases, the simulated fixes resulted in some small isolated sections of track which remain single track being required to carry additional traffic. The practicalities of operating such a complex system means that in practice it is likely

[3] As noted above also, the service provided by the Goldsworthy Line cannot currently be accessed by FMG pursuant to Part IIIA. The assumption that it might be has only been taken in order to carry out this modelling in a practical context.

that these small sections would also have to be double tracked, although this is not included in the analysis.

3.2 For both sets of corrective measures for scenarios B1, B2 and D1, D2:

(a) The costs estimates are based on BHPBIO's current experience and expertise in expanding its existing rail system, including the Mt Newman Line. However, the current market conditions make estimating difficult. The correct figures for the costs may be higher than the estimates given.

(b) There is an inherent complexity in expanding any part of the system in that some expansions are relatively "cheap" and some are relatively "expensive" when measured on the basis of dollars per tonne of increased annual capacity. The base-line from which BHPBIO is expanding will change the costs of the fixes, depending upon whether BHPBIO has just recently concluded a "cheap" or "expensive" expansion. In this case, the base-line is the recently approved RGP3 expansion. A new base-line in the future may change, perhaps significantly, these quoted numbers.

3.3 It should be noted that any significant capital expenditure on the Mt Newman Line (such as that outlined above) would require BHP Billiton Board approval. The estimates given above however, do not include any allowance for issues such as:

(a) risks of capital cost overruns;

(b) construction or other time delays;

(c) completion guarantees and other contractual matters;

(d) credit risk concerns, in circumstances where a third party operator is required to pay for capital works undertaken by BHPBIO;

(e) concerns that BHPBIO will be otherwise properly compensated for, or indemnified for, any other risks; or

(f) risks of works interfering with the existing operations on the Mt Newman Line and at mine and port sites.

It is anticipated that BHP Billiton Board approval for any capital works will be dependent upon the above issues (and any other relevant issues) having been fully accounted for.

DOCUMENT 4
COSTS OF CORRECTIVE MEASURES AND DOUBLE TRACKING

4. TOTAL COST OF DOUBLE TRACKING

4.1 In its Draft Recommendation, the Council refers to the costs of expanding the facility in order to satisfy all foreseeable demand.[4] It must be noted that the corrective measures outlined above (including double tracking of the Mt Newman Line) are not sufficient to satisfy BHPBIO's foreseeable demand, which is expected to be [**CONFIDENTIAL CONFIDENTIAL**]. For the Mt Newman Line to be used to transport in excess of 200mtpa of iron ore, full double tracking is required. The estimated cost of double tracking the Mt Newman Line, after the RGP3 modifications have been completed, is an additional **$1,747m** as below.

	Distance – excluding sidings (km)	**Cost per km (A$m/km)**	**Approximate Cost (A$m)**
Bing to Mooka	9.71	3.0	29.13
Mooka to Walla	20.28	3.0	60.84
Walla to Abydos	60.61	2.7	163.65
Abydos to Spring	37.09	2.6	96.43
Spring to Garden	17.66	2.6	45.92
Garden to Shaw	6.32	5.4	34.13
Shaw to Hesta	10.08	4.1	41.33
Hesta to Cowra	15.15	4.1	62.12
Cowra to Gidgi	12.11	4.1	49.65
Gidgi to Yandi Junction	5.15	4.1	21.12
Yandi Junction to Area C	57.00	5.0	285.00
Yandi 2 to Yandi	5.40	4.5	24.30
Yandi Junction to Whaleback	112.0	3.0	336.0
Jimblebar to Jimblebar Junction	32.32	3.0	96.96

[4] NCC Draft Recommendation at 6.94 - 6.96

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COSTS OF CORRECTIVE MEASURES AND DOUBLE TRACKING

	Distance – excluding sidings (km)	**Cost per km (A$m/km)**	**Approximate Cost (A$m)**
Bridges			400.0
Total	**400.88**		**$1,747**

4.2 It should be noted that BHPBIO has not determined whether the Mt Newman Line will ever be double-tracked in the manner set out above, if at all. While BHPBIO's demand will increase to the levels set out above, BHPBIO may construct quite separate port and rail facilities to meet that demand going forward, rather than double tracking the Mt Newman Line. Due to the current port constraints at Port Hedland, the high costs of removing those constraints (as detailed in other submissions), and the risks inherent in depending upon a single integrated mine/rail/port production system[5], it may be more attractive for BHPBIO to construct separate new port and rail facilities to service its own foreseeable requirements for iron ore production.

4.3 The costs estimates given above are based on BHPBIO's current experience and expertise in expanding its existing rail system, including the Mt Newman Line. However, the current market conditions make estimating difficult. The correct figures for the costs may be higher than the estimates given.

[5] The Pilbara region is affected by floods, cyclones and other natural disasters that can damage or destroy sections of track. Recently, ARG experienced this in WA when 1 kilometre of its railway track was washed away due to flash flooding: see *The Canberra Times* "Rail track wash out", 3 January 2006.