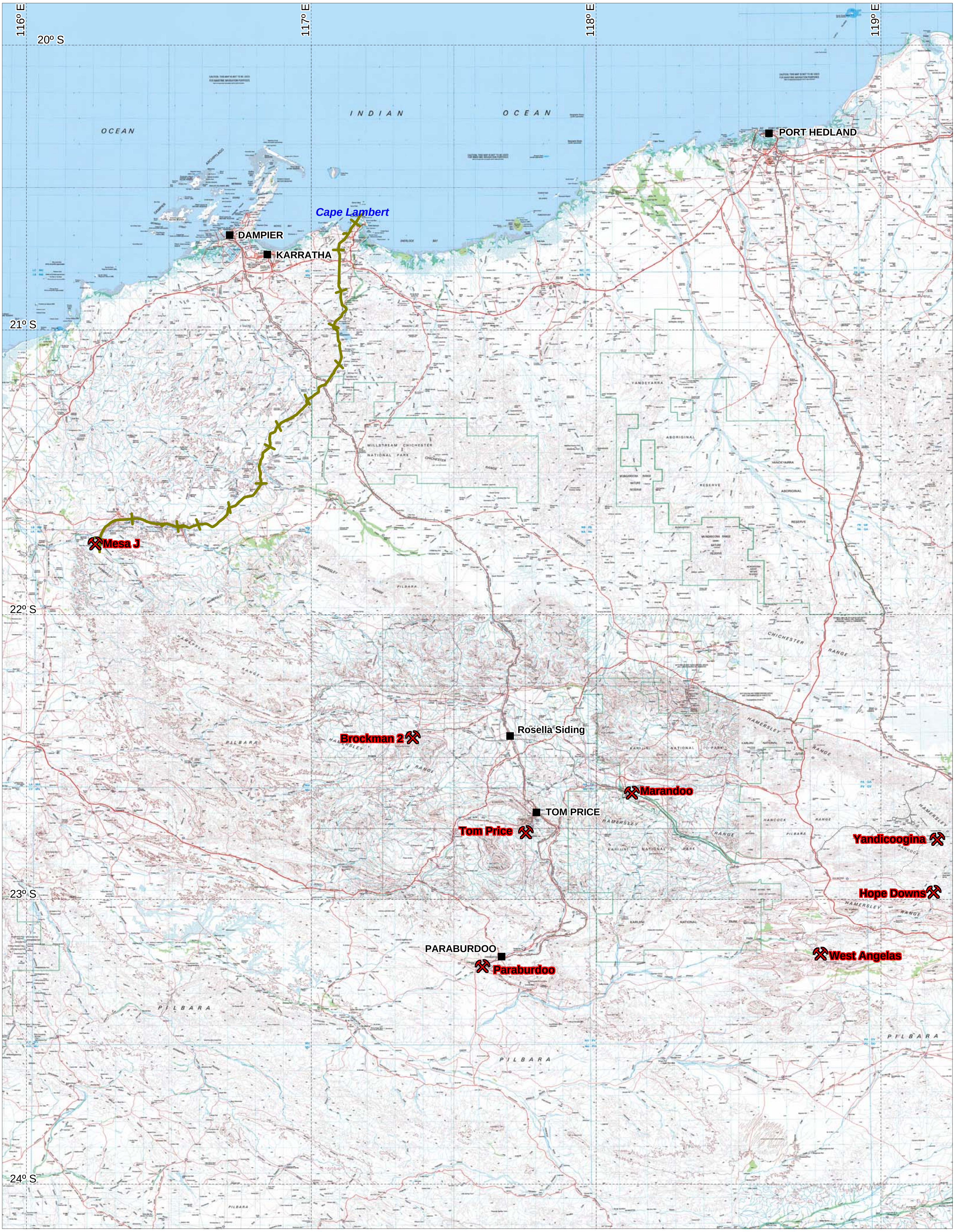
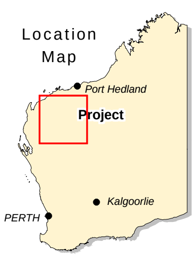
Attachment 1





—	Robe Railway
- - -	Other Rail Networks
⚒	Select Major Mines
■	Select Localities

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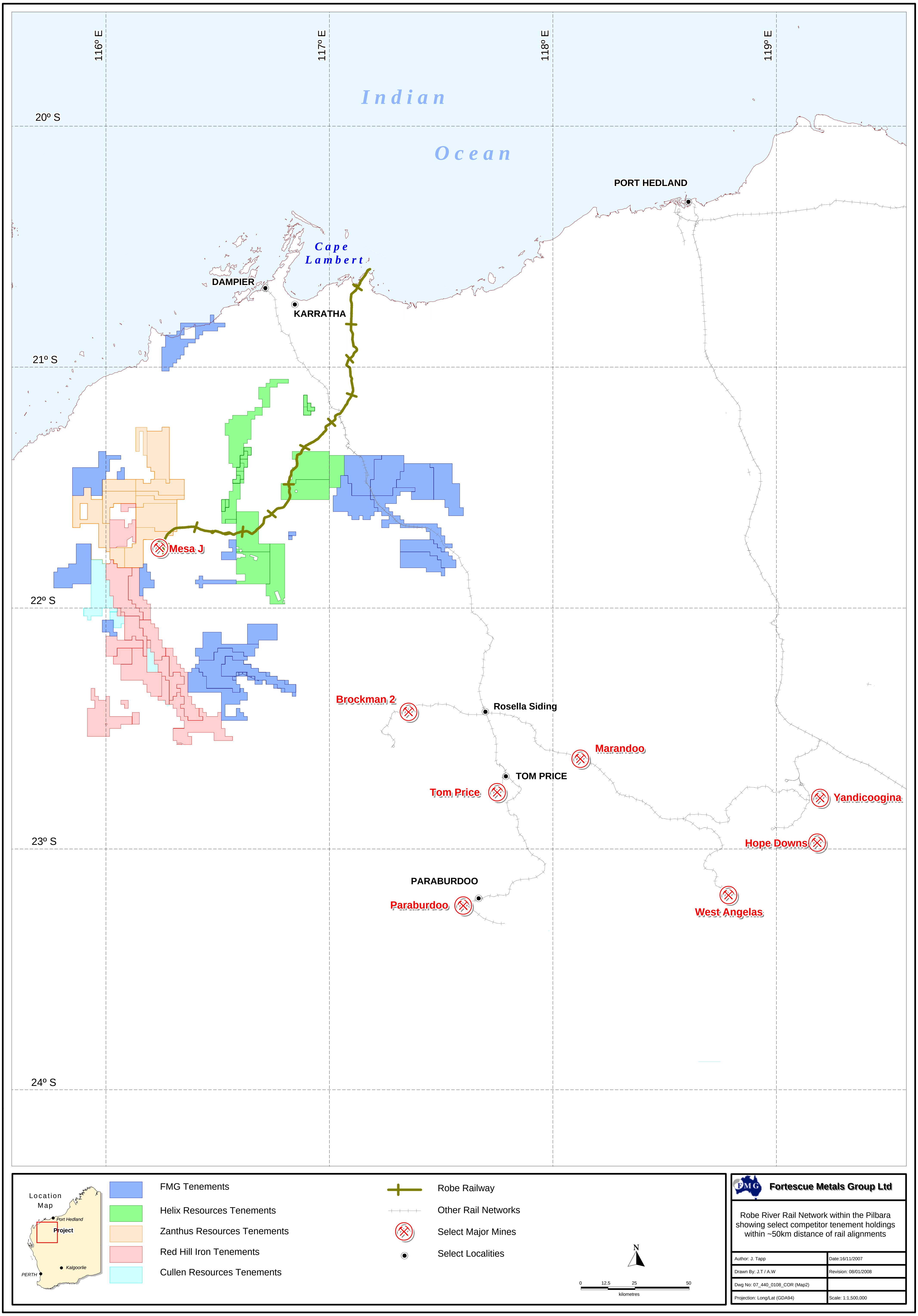
kilometres

Fortescue Metals Group Ltd

Robe River Rail Network Throughout the Pilbara

Author: J Tapp	Date:16/11/2007
Drawn By: Jen Thomson	Revision: 08/01/08
Dwg No: 07_440_0108_COR(Map1)	Report No:
Projection: Long/Lat (GDA94)	Scale: 1:1250000

Attachment 2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117º E
118º E
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21º S
22º S
23º S
24º S
Indian
Ocean
PORT HEDLAND
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Lambert
DAMPIER
KARRATHA
Mesa J
Brockman 2
Rosella Siding
Marandoo
TOM PRICE
Tom Price
Yandicoogina
Hope Downs
PARABURDOO
Paraburdoo
West Angelas
Location
Map
Port Hedland
Project
Kalgoorlie
PERTH
FMG Tenements
Helix Resources Tenements
Zanthus Resources Tenements
Red Hill Iron Tenements
Cullen Resources Tenements
Robe Railway
Other Rail Networks
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Select Localities
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kilometres
Fortescue Metals Group Ltd
Robe River Rail Network within the Pilbara showing select competitor tenement holdings within ~50km distance of rail alignments
Author: J. Tapp
Date:16/11/2007
Drawn By: J.T / A.W
Revision: 08/01/2008
Dwg No: 07_440_0108_COR (Map2)
Projection: Long/Lat (GDA94)
Scale: 1:1,500,000

Attachment 3

RIO TINTO

Rio Tinto Iron Ore
Telephone: +61 8 9327 2220
Facsimile: +61 8 9327 2667

1 August 2003

Facsimile: 9385 5805 [1 page]

Mr Andrew Forrest
Chief Executive Officer
FMG Limited

Dear Andrew,

Firstly, thank you for your presentation on Wednesday 30th July 2003. I was pleased that we were able to fix up the meeting at such short notice and I welcomed the opportunity to hear first hand something of your plans for FMG Limited.

As I pointed out at our meeting, we would find it difficult to accept your concept of coordinating the development of your proposed rail and port system to serve the requirements of Rio Tinto Iron Ore (RTIO). RTIO sees the efficient operation of its lifeline supply chain assets as a key competitive advantage and the control of this system as a strategic imperative.

You will note from the announcements made yesterday in conjunction with the release of Rio Tinto's half year results that we have committed to developing further our rail and port assets. We believe this will satisfy our infrastructure requirements for some time to come. You will appreciate that for legal reasons I was unable to divulge this information during our meeting. I also pointed out at our meeting that I would not waste your time. Accordingly, I wish to take this opportunity to let you know that we will not be pursuing your concept further.

Once again, thank you for meeting with me at short notice and good luck with your project.

Yours sincerely,

Chris Renwick

Chris Renwick
Chief Executive – Iron Ore

Fortescue Metals Group Ltd
ACN: 002 594 872
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50 Kings Park Road West Perth
Western Australia 6005
PO Box 910, West Perth, Western Australia 6872

Telephone: + 61 8 9266 0111
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Website: www.fmgl.com.au

22 February 2005

ATTENTION: MR SAM WALSH

Chief Executive Officer
Rio Tinto Limited
152 -158 St Georges Terrace
PERTH WA 6805

Dear Mr Walsh

Strictly Private and Confidential

Our mutual friend, Graeme Rowley mentioned he caught up with you at the recent Sting concert in Leeuwin. Sting certainly cemented his reputation amongst my friends as one of the class performers of our time and his ability to lead his band and credit their contribution showed considerable grace.

I have however, an interest above Sting's reputation with my friends.

We read often of the substantial concern emanating from China that the Pilbara region of Western Australia suffers from infrastructure which is bottlenecked and that we are not moving fast enough to alleviate this situation. As you will appreciate, Fortescue Metals Group Limited (**"Fortescue"**) is also mindful of this concern as we are on the brink of commencing an investment of some $2 billion into this very area.

Fortescue is currently capitalised at approximately $1 billion and continues to press forward from a position of $200 million in cash and receivables, to over $500 million as a platform for its long term financing. Fortescue's primary project, the Chichester Ranges is unveiling a group of small but highly attractive microplaty hematite deposits that will blend well with our run-of-the-mill low phosphorous Marra Mamba deposits. Technically, the market appears well satisfied with the blend.

Product quality is no longer a concern, rather I am focussed on the potential that often occurs during periods of strong commodity demand where participants over-invest in capacity, in an often repeated overreaction to these temporary conditions. It is for that reason that I introduce myself. I wish to explore with you as to whether our 45 million tonne base capacity can be more economically expanded to accommodate any of the growth plans of Rio Tinto Iron Ore in a more efficient manner than is perhaps currently envisaged by your independent plans.

Fortescue is a highly cooperative group which recognises that the long term optimal strategy for the Pilbara participants is to coordinate their infrastructure investments. This coordination can allow the most effective competitive operating cost position to be achieved by the Pilbara iron ore industry as a whole, as opposed to each individual participant simply pursuing its interests without the available efficiencies of scale.

I would be keen to know if you share this view and to meet with you at a time and place of your convenience. Is there a role for Rio Tinto to take the band lead in what is otherwise a seemingly disparate though major group of iron ore participants in the Pilbara? Should I not hear from you, say in a week, I shall assume you have no interest but would of course still wish you well with your separate expansions.

Yours sincerely,
Fortescue Metals Group Ltd

Andrew Forrest
Chief Executive

RIO TINTO

IRON ORE

CHIEF EXECUTIVE

1 March 2005

Facsimile: 9266 0188

Mr Andrew Forrest
Chief Executive
Fortescue Metals Group Ltd
50 Kings Park Road
West Perth WA 6005

Dear ~~Mr Forrest~~ Andrew,

Thank you for your letter dated 22 February 2005.

Your letter makes a number of comments regarding Fortescue's proposed development of various iron ore deposits in the Pilbara. We are however not aware of any new information regarding those deposits which would lead us to conclude that they should be considered for possible inclusion in the development plans for Rio Tinto Iron Ore's Pilbara operations.

In relation to the development of the Pilbara iron ore industry generally, our view is simply that each participant should pursue its own optimal development pathway. We are also mindful that Rio Tinto Group policy prohibits any anti-competitive co-ordination of activities with another current or potential industry participant.

While I thank you for your interest, we see no basis for the discussion proposed by you.

Yours faithfully,

Sam Walsh

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Facsimile: + 61 8 9266 0188
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FAXED

3 March 2005

ATTENTION: MR SAM WALSH

Chief Executive Officer
Rio Tinto Limited
152 -158 St Georges Terrace
PERTH WA 6805

Dear Sam,

Strictly Private and Confidential

I acknowledge receipt of your letter 1 March 2005, the contents of which I find enlightening but perhaps not surprising. We, as a highly cooperative Pilbara corporation, wish to share our infrastructure but not our deposits.

As you will be unquestionably aware every newspaper, every economist and indeed every politician (from both sides) is exhorting mining companies and governments to maximise the efficient use of infrastructure in order to advance the economic position of Australia a whole during this period of mineral export boom.

My letter of 22 February was intended to raise with you the possibility of a collaborative approach to the use of infrastructure in the Pilbara in response to these demands. Accordingly, the reference in your letter to anti-competitive coordination astounds me as it is completely contrary to the issues I was raising.

Yours sincerely,
Fortescue Metals Group Ltd

Andrew Forrest
Chief Executive

Attachment 4

CoRE research
Competition & Regulatory Economics
MELBOURNE - AUSTRALIA

The Evaluation of Criterion (b) in Long-Haul Rail Services

A Report on behalf of DLA Phillips Fox

Joshua Gans

The analysis here represents the views of CoRE Research Pty Ltd (ACN 096 869 760) and should not be construed as those of DLA Phillips Fox or its clients.

PRIVILEGED AND CONFIDENTIAL

19th December, 2007

Contents

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1 Background

I have been asked to evaluate whether it is likely to be more economic to build a separate rail track and corridor as opposed to expand the operation of existing facilities in long heavy-haul rail networks in the Pilbura. This evaluation is in the context of access seekers wanting to utilise existing rail networks for above rail haulage operations. Specifically, the issue is whether it is "uneconomic for anyone to develop another facility to provide the service." The purpose of this exercise is to provide the relevant economic approach to this issue in order to properly formulate the evidence needed to make the required evaluation.

This brief report proceeds as follows. First, I consider the application of the *pure* natural monopoly test and conclude that it is likely to be unsuitable for this environment. Second, I consider a net social benefit test as favoured by the Australian Competition Tribunal. I show how this can be evaluated in the case of long-haul rail networks and also propose an evidentiary test to determine whether a rail network would be economic to duplicate or not.

2 The Natural Monopoly Test

To begin, I examine the natural monopoly test and evaluate its usefulness in the assessment of criterion (b). The traditional definition of a *natural monopoly* is this:

> An industry is said to be a natural monopoly if for any given output, the social costs of production are lower when that output is produced by one rather than two or more firms.[1]

Notice that this is defined relative to an "industry" and with respect to the number of firms as opposed to facilities or plants. Of relevance here, the industry refers to the service of using a given section of rail track in the Pilbura for the requirements of both its owner and also other prospective users (such as FMG).

This service could be produced by one firm or more than one firm. It is considered a natural monopoly if the social cost of providing the service would be lower if just say, its owner, provided the required service compared with its owner and others doing so.

Technically, examining whether a service constituted a natural monopoly would involve considering whether, for *any* given level of industry output, Q with $C_i(q)$ being the (social) costs of production for firm i for an output of q:

$$C_{OWN}(Q) \leq C_{OWN}(\alpha Q) + C_{OTH}((1-\alpha)Q)$$

for any arbitrary fraction, α. Notice that this test requires one to examine *all* potential levels of industry demand; or at least those that are reasonably expected to arise. So while it may be that, for low levels of output, the above inequality is satisfied, higher levels may make having more than one producer cost effective. In this case, the industry would not be considered to be a natural monopoly.

2.1 Capacity constraints

When a facility is being utilised at a level below its potential capacity and seeker demand would be unlikely to raise it to that capacity, even

[1] See, for example, Joshua Gans, Frances Hanks and Philip Williams, "The Treatment of Natural Monopoly under the Australian *Trade Practices Act*: Three Recent Decisions," *Australian Business Law Review*, Vol.29, No.6, December, 2001, pp.492-507.

aside from natural monopoly considerations, it is plausible that accommodating seeker demand would be preferable to duplicating the capacity in the facility. However, note that the very existence of capacity constraints means that there exist levels of demand such that duplication will be cost minimising. Recall that a natural monopoly is evaluated at all potential outputs for an industry. However, if a plant or facility were to reach capacity, then, by definition, the marginal costs associated with exceeding that capacity are infinite. Thus, to produce *anything* beyond that capacity requires another plant or facility.

Consequently, industries with capacity constraints pose a particular issue for the application of the natural monopoly test to evaluate whether a facility is uneconomic to duplicate. I will argue here, therefore, that the pure application of that test is not appropriate.

What would happen, however, if we took a more limited view of the natural monopoly test and restricted it to plausible ranges of demand. At a first pass, this might suggest that, if plausible demand in an industry were to reach capacity then, it would not constitute a (partial) natural monopoly because the costs associated with meeting that demand would be lower if two plants or facilities existed. One issue that I will consider in more detail in Section 3 is that this places an undue weight on costs without consideration of demand drivers. However, another issue is that this type of analysis confuses a facility with a firm. However, as I argue here, this is not necessarily the case. Even when plausible demand exceeds capacity that does not imply that it is cost minimising to duplicate a facility.

To see this, consider a single track rail line. Suppose that it is assessed that this single track rail line has reached capacity. Hence, to meet higher levels of demand a second rail line needs to be constructed. Does that mean that the industry is not a (partial) natural monopoly?

It is unlikely that this is the case. This is because the issue for natural monopoly is not whether one, two or ten rail lines are necessary to meet demand. Instead, the issue is whether there are economies to be realised from common ownership and operation of them.

There are good reasons to believe that those economies would exist. On the one extreme, suppose that one track travels through a canyon and it is not possible to build the second track anywhere near it. Instead, the second line – still connecting the same two locations as the first – is built on another, very separate path. In this situation, having a coordinated system operating the two would be beneficial. Why? Because one line could be used for incoming traffic while the other could be used for outgoing traffic. That would reduce the costs of scheduling two-way operations.

On the other extreme, the rail racks could be side by side. In this case, links between them could optimise the flow of traffic and allow more efficient management of trains with differing speeds and also who might travel on only certain lengths of the track.

On an intermediate level, each line could have connections between them that would allow each to be used as a passing loop for the others to manage traffic of heterogeneous speeds. Once again, this demonstrates the returns to networking as opposed to fully separate facilities.[2]

That said, in principle, each of these lines could be owned by different entities. The firms could then contract between each other to ensure that economies of coordination are realised. However, this will likely impose transaction costs that would not otherwise be incurred if the system was commonly owned and operated.

The point to note here is that capacity constraints, while making it a little harder to evaluate whether an industry is a (partial) natural monopoly, do not rule it out.

2.2 Foreseeable demand

There is also a difference between natural monopoly and the notion that it would cost more to satisfy foreseeable demand by developing another facility. As noted earlier, a natural monopoly is evaluated at all levels of demand. Thus, the fact that the access provider had 80 percent of that potential and seekers 20 percent, would make no difference in the evaluation of a natural monopoly. However, whether it would cost more to satisfy the 20 percent seeker demand in addition to the provider's demand is relevant for criterion (b).

To see this, consider the following hypothetical example. Suppose that it costs $300 to develop a rail line and the marginal costs of operating the rail line rise from $0 for the first 50 units to $10 per unit for the next 50 and that capacity is reached at 100 units. Suppose also that provider demand is 70 units and seeker demand is 20 units. Finally, we suppose one rail line already exists so that its development costs are sunk.

Now under the natural monopoly test we would ask: is it cheaper to have two lines to satisfy the 90 units of total demand or just have one

[2] See, for example, the discussion in J.M. Preston, "A Simple Model of Rail Infrastructure Capacity and Costs," *ITS Working Paper*, No.370, Institute for Transport Studies, University of Leeds, 1992. See also, NERA, "Review of Overseas Railway Efficiency," Report for the Office of the Rail Regulator, July 2000, that documents returns to rail network size and density.

line. With one line, the total costs are $10 x (90 – 50) = $400. With two lines, the total costs are $300 + $0 = $300. Thus, it is cheaper to have two lines; so it is a natural monopoly at this level of demand. Why? Because once you allocate demand optimally across both lines, the savings in marginal cost outweigh the additional development costs.

However, it cannot be presumed that, if the additional rail line was owned by another party, the incumbent provider would want or be able to allocate demand to it. In this case, with an additional line, total costs are $300 + $10 (70 – 50) = $500. That is, total costs are higher with an additional line than would be the case if we just had one line.

Thus, the application of the natural monopoly test presumes that after another facility is developed, demand will be allocated optimally across all facilities. It is an evidentiary matter whether this is likely to be the case or not. However, it cannot be presumed that this will be the case when those facilities are owned and operated by different firms.

2.3 Summary

What this analysis suggests is that the *strict application* of the natural monopoly test is not likely to be relevant in the application of criterion (b). Instead, something more in the spirit of that test but that takes into account likely ranges of demand and their use patterns across facilities will be relevant. I consider such a broader approach in the next section.

3 The Net Social Benefit Test

According to the Australian Competition Tribunal, the test for criterion (b) is a social test:

> [the] test is whether for a likely range of reasonably foreseeable demand for the services provided by means of the pipeline, it would be more efficient, in terms of costs **and benefits** to the community as a whole, for one pipeline to provide those services rather than more than one. (Duke EGP decision, para 137)
>
> ...the uneconomical to develop test should be construed in terms of the associated costs **and benefits** of development for society as a whole. (Sydney Airport) [**emphasis** added]

Notice that the test considers not only the social costs associated with developing another facility but social benefits as well. In contrast, the natural monopoly test and approach either ignores social benefits or presumes that these benefits are the same regardless of whether another facility is developed or not.

Here I argue that not considering the benefit side of the social decision equation can lead to misleading results in certain cases. In particular, the benefits realised can differ between the factual (no development of another facility/providing access) and the counterfactual (developing another facility). This is especially the case where there are capacity constraints in the short, medium and/or long term.

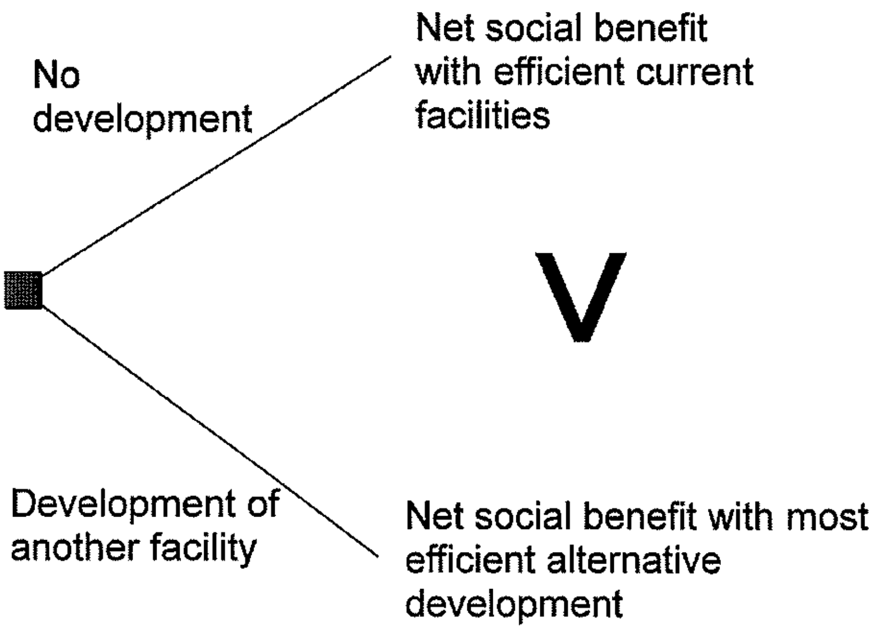
3.1 The Social Decision Tree

In economics, an evaluation of whether it is 'economical' to take an action is conducted by comparing the net benefits that flow from the consequence of taking that action with those that arise from doing the next best alternative. If the net benefits from the action exceed all other alternatives, then that action is said to be economical.

When it comes to the consideration of whether it is economical not to develop another facility, or equivalently, uneconomical to develop another facility to provide the service, a decision tree can be constructed to assist in evaluating the net benefits associated with each action.

Figure 1 shows such a decision tree. The tree begins with a decision node (the square) with two branches extending from it. The top branch corresponds to the choice of not developing another facility while the bottom branch corresponds to the choice of developing another facility. At the end of each branch, we have said in words what the consequence of each action is.

Figure 1: Social Decision Tree



Analysis of this decision tree requires us to do a few things. First of all, we need to carefully unpack the consequences in terms of net social benefits flowing from each action. Second, we need to evaluate what the best alternative is to providing access. That is, we need to consider the appropriate counterfactual. In what follows I consider each brand in turn.

3.2 The Factual

There are several consequences that will flow from no alternative facility being developed and seekers being able to access a rail line.

1. *Usage*: Non-owner usage will occur on the rail line.
    a. In the absence of any congestion on that line this will be a pure increment to the rail line's utilisation.
    b. However, if, at any time, there are capacity or scheduling issues, then seeker usage will be managed as part of the overall mix. Thus, some of the usage

from seekers will displace the provider's usage that it would have had had there been no access. In this case, usage is said to be *constrained.* The extent of that displacement will depend upon the value of the ore being transported as well as the relative efficiency of the mining operations of seekers.

c. For use later on, it will be assumed that the provider's usage under access will be Q^a and those of others will be q^a.

2. *Costs*: Seekers will cause additional costs on the rail line.
    a. In the absence of any congestion on that line, the costs associated with access will include:
        i. Scheduling: the costs of managing a more complex schedule
        ii. Maintenance: any costs arising from additional usage causing wear and tear on the rail lines
        iii. Accidents: any costs associated with accidents or the holding of adequate insurance.
        iv. Investment costs: once off investment costs to ensure interconnection with non-owner's transportation needs.
    b. If there is congestion on that line, the costs associated with access will include these costs plus:
        i. The loss in revenue from the displacement of the owner's shipments.
    c. Should the access demands cause augmentation of the rail line or bring forward such augmentation this will give rise to the following additional costs:
        i. The costs associated with the augmentation or the capital costs of bringing that augmentation forward.
        ii. Less the profit benefits to the owner that arise from the augmentation including additional shipments made possible and a reduction in scheduling complexity.
    d. We denote the on-going costs associated with access by $c(q^a)$, and for the provider, the on-going costs are $C(Q^a)$. The augmentation costs are A. Note that the profit gains to the provider from augmentation are relative to what it would transport in the absence of

that augmentation. However, measuring these is best taken as part of the counterfactual.

Finally, suppose that the (inverse) demand for seekers was denoted by $p(q)$.[3] Then (absent mining costs and beyond rail transportation costs), the net social benefit from access is:

$$p(q^a)q^a - c(q^a) + P(Q^a)Q^a - C(Q^a) - A$$

3.3 The Counterfactual

The counterfactual involves evaluating the net benefits that are generated if another facility is developed. It is assumed here that that facility would not be owned and operated by the potential access provider.

Using notation, I will assume that if an alternative line is built, the quantities of the potential access provider and the seekers become Q^d and q^d respectively. The quantity, Q^d, assumes that the potential provider will augment its existing track. However, it may be the case that, in the absence of seeker demand, it only partially augments it at a cost, a, to meet a lower usage of $\underline{Q}^d$.[4] The potential provider may find it more profitable to take this option. I will also assume that the capital costs of building another rail line are D (including the costs associated with securing necessary easements and over-coming any environmental issues) while the on-going costs of the alternative line would be $c^{ALT}(q^d)$.

Given this, the net social benefit realised in the counterfactual is:

$$p(q^d)q^d - c^{ALT}(q^d) - D$$
$$+\max\left\{P(Q^d)Q^d - C(Q^d) - A, P(\underline{Q}^d)\underline{Q}^d - C(\underline{Q}^d) - a\right\}$$

[3] Note that conceptually $P(Q)Q$ and $p(q)q$ could be viewed as the profits net of rail haulage costs for the potential provider and access seekers respectively. Thus, differences between them may include the quality of ore mined and the efficiency of their mining and logistics. Putting in all those terms is avoided here to keep the notation simple.

[4] I have ignored in the factual the choice over the scale of augmentation and simply assumed it to be the maximal level. To consider it is a little more complex than in the counterfactual as it depends upon the access price and other factors that will impact on seeker as well the potential provider's use of the facility. These could be factored in but for the moment I have set them aside.

3.4 Back to the Decision

With this analysis of the factual and the counterfactual, we are now in a position to consider the social decision in more detail. Recall that, from Figure 1, a choice of developing another facility will be considered uneconomical if the net social benefits from no development exceed those from development. Using the equations derived above, this will occur if the following inequality holds:

$$\begin{aligned} p(q^a)q^a - c(q^a) + P(Q^a)Q^a - C(Q^a) - A \\ \geq p(q^d)q^d - c^{ALT}(q^d) - D \\ +\max\left\{P(Q^d)Q^d - C(Q^d) - A, P(\underline{Q}^d)\underline{Q}^d - C(\underline{Q}^d) - a\right\} \end{aligned}$$

A direct calculation of these variables would allow us to quantify whether it was uneconomic to develop another facility or not.

However, it may be the case, that some variables are difficult to quantify or alternatively, that the facts of the case mean that certain simplifying assumptions are justified. In what follows, I consider some simplifying assumptions and demonstrate what these mean for the social test.

3.4.1 What if access causes additional augmentation?

As a first simplifying case, I examine what happens if it is the access demand itself that causes the additional augmentation. That is, suppose that in the counterfactual, the potential provider would choose a lower capacity than in the factual. In this case, the social decision inequality becomes:

$$\begin{aligned} p(q^a)q^a - c(q^a) + P(Q^a)Q^a - C(Q^a) - A \\ \geq p(q^d)q^d - c^{ALT}(q^d) - D + P(\underline{Q}^d)\underline{Q}^d - C(\underline{Q}^d) - a \end{aligned}$$

Now to simplify just a little further, let's assume – quite reasonably – that the augmentation would actually cover non-owner's potential usage requirements. If, in addition, the alternative rail line is not significantly more efficient than the existing rail line then, $q^a = q^d$. In this case, the inequality becomes:

$$\begin{aligned} p(q^d)q^d - c(q^d) + P(Q^a)Q^a - C(Q^a) - A \\ \geq p(q^d)q^d - c^{ALT}(q^d) - D + P(\underline{Q}^d)\underline{Q}^d - C(\underline{Q}^d) - a \end{aligned}$$

Or

$$D \geq P(\underline{Q}^d)\underline{Q}^d - C(\underline{Q}^d) - a - (P(Q^a)Q^a - C(Q^a) - A)$$

Notice that the right hand side of this inequality is the loss in profits the provider incurs by augmenting the rail to satisfy seeker demand.[5] Critically, it is not simply the additional augmentation costs that would arise in the natural monopoly test.

However, suppose that the augmentation was purely to satisfy seeker demand and the provider would use the line to the same extent before and after the additional expansion. Then $Q^a = \underline{Q}^d$, and the inequality becomes:

$$D \geq A - a$$

This is precisely equivalent to the NCC's application of criterion (b) in past decisions on rail access.

3.4.2 Will augmentation occur regardless?

Given the relatively low usage requirements of access seekers for rail services in the Pilbura, it may be reasonable to assume that the provider will augment or expand the existing line based on its own usage needs and independently of those of others. Further, it may be supposed that it will expand the line eventually to its maximum capacity.

In this case, the social decision inequality simplifies to:

$$p(q^a)q^a - c(q^a) + P(Q^a)Q^a - C(Q^a) - A$$
$$\geq p(q^d)q^d - c^{ALT}(q^d) - D + P(Q^d)Q^d - C(Q^d) - A$$

Notice that, as the costs of augmentation are incurred in either case, they are not relevant to the social decision. Hence, we have:

$$p(q^a)q^a - c(q^a) + P(Q^a)Q^a - C(Q^a)$$
$$\geq p(q^d)q^d - c^{ALT}(q^d) - D + P(Q^d)Q^d - C(Q^d)$$

What this equation says is that the main benefit of developing an alternative facility is that it increases rail haulage capacity allowing (i) more provider traffic to flow along it and (ii) allowing more seeker traffic to flow from along it. If the value of this extra traffic (in terms of net revenues earned) is less than the costs of developing another facility, it is not economical to develop that facility.

Note that it might be argued that, even with a large degree of augmentation, that the provider would be capacity constrained to such an extent that seeker traffic could not be supported on the

[5] This becomes especially relevant when augmentations and expansions are lumpy. Instead, if such investments can be tailored just to meet seeker demand, then the lost profits are not relevant.

existing line at its full opportunity cost. In this case, $q^a = 0$ and $Q^a = Q^d$. The above inequality would then simplify to:

$$P(Q^d)Q^d - C(Q^d) \geq p(q^d)q^d - c^{ALT}(q^d) - D + P(Q^d)Q^d - C(Q^d)$$

or

$$0 \geq p(q^d)q^d - c^{ALT}(q^d) - D$$

What this says is that it will only be uneconomic to develop another facility if the actual private profits to the facility owner are negative. That is, the social version of uneconomic and the private version coincide.[6]

3.4.3 When is a rail line likely to be capacity constrained?

The above analysis takes into account the potential for capacity constraints on the existing line that mean that, should access be sought, then it is possible that both seekers' and the provider's usage may be lower than in the counterfactual.

Suppose that this is not the case (there are no capacity constraints and also the provider is likely to augment its facility in any event), then $Q^a = Q^d$. In this situation, the social decision inequality simplifies to:

$$p(q^a)q^a - c(q^a) + P(Q^d)Q^d - C(Q^d) \geq p(q^d)q^d - c^{ALT}(q^d) - D + P(Q^d)Q^d - C(Q^d)$$

Or

$$p(q^a)q^a - c(q^a) \geq p(q^d)q^d - c^{ALT}(q^d) - D$$

Notice that it may still be the case that $q^a \neq q^d$ as the efficiency of the alternative line may be different from the existing line.

If their efficiency is the same (or at least no better than the provider) then the social decision inequality is further simplified to:

$$p(q^d)q^d - c(q^d) \geq p(q^d)q^d - c(q^d) - D$$

or

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[6] There is a sense in which this case – if applicable – suggests that the social value of access may be zero. For this to be true, then the ore quality and mining efficiency of seekers and also prospects yet to be discovered would be known to be so low relative to the provider's that these activities are not worth undertaking. However, in that case, it would be criterion (a) that would not be satisfied. It is not possible to find that criterion (a) is satisfied and simultaneously that this case could arise. Hence, in my opinion, it is not worth consideration as part of a criterion (b) analysis.

$$D \geq 0$$

Hence, it is always uneconomic to develop another facility.

3.5 An evidentiary test

In reality, a social test is difficult to apply because demand will fluctuate, providing more opportunities to for seekers to access the infrastructure without creating a capacity issue and because overall demand growth will be an estimate.

For this reason, to understand whether the economies of coordination imply that augmenting an existing rail network is more cost effective and likely to result in net social benefits than a new rail network (not interconnected with the existing network) to accommodate seeker demand, it is useful to posit an evidentiary test.

> *Consider the following hypothetical scenario whereby the demand of all seekers is transferred to the infrastructure provider. Then, a facility will be considered uneconomic to duplicate if the provider would rather augment their own existing network than build a new rail network to accommodate that demand.*

This test is based on the logic of the efficient component pricing rule that neutralises the make versus buy decision between access providers and access seekers.

Thus, to take a simple scenario, let's re-consider the example considered in Section 2.2. In that case, seeker demand was 20 units while provider demand was 70 units. To apply the test, we suppose that the seeker's 20 units will fetch $50 per unit in revenue (perhaps because it is of lower quality or harder to extract) while the provider's will fetch $60 per unit. We allocate the seeker's demand to the provider and ask what the provider will do.

Option 1 is to put the demand on the existing network. In this case, by having a single line, total costs are $400 while total revenue is $50 x 20 + $60 x 70 = $5,200. The net benefit is therefore, $4,800.

Option 2 is to build an additional network. Doing that and re-optimising, yields the same revenue but the costs fall by $100 as spreading capacity over two networks results in cost savings that outweigh the investment costs of duplicating that network. Thus, in this scenario, duplication would be economic.

But there is a third option: to augment the additional network so as to reduce the high demand costs of operation. Suppose that the augmentation costs were $x. Then, so long as $x was less than the operational costs caused by higher demand ($400) and were lower than the costs of building a new network ($300), then this would be a superior option to both putting demand on the existing network and building an additional network.

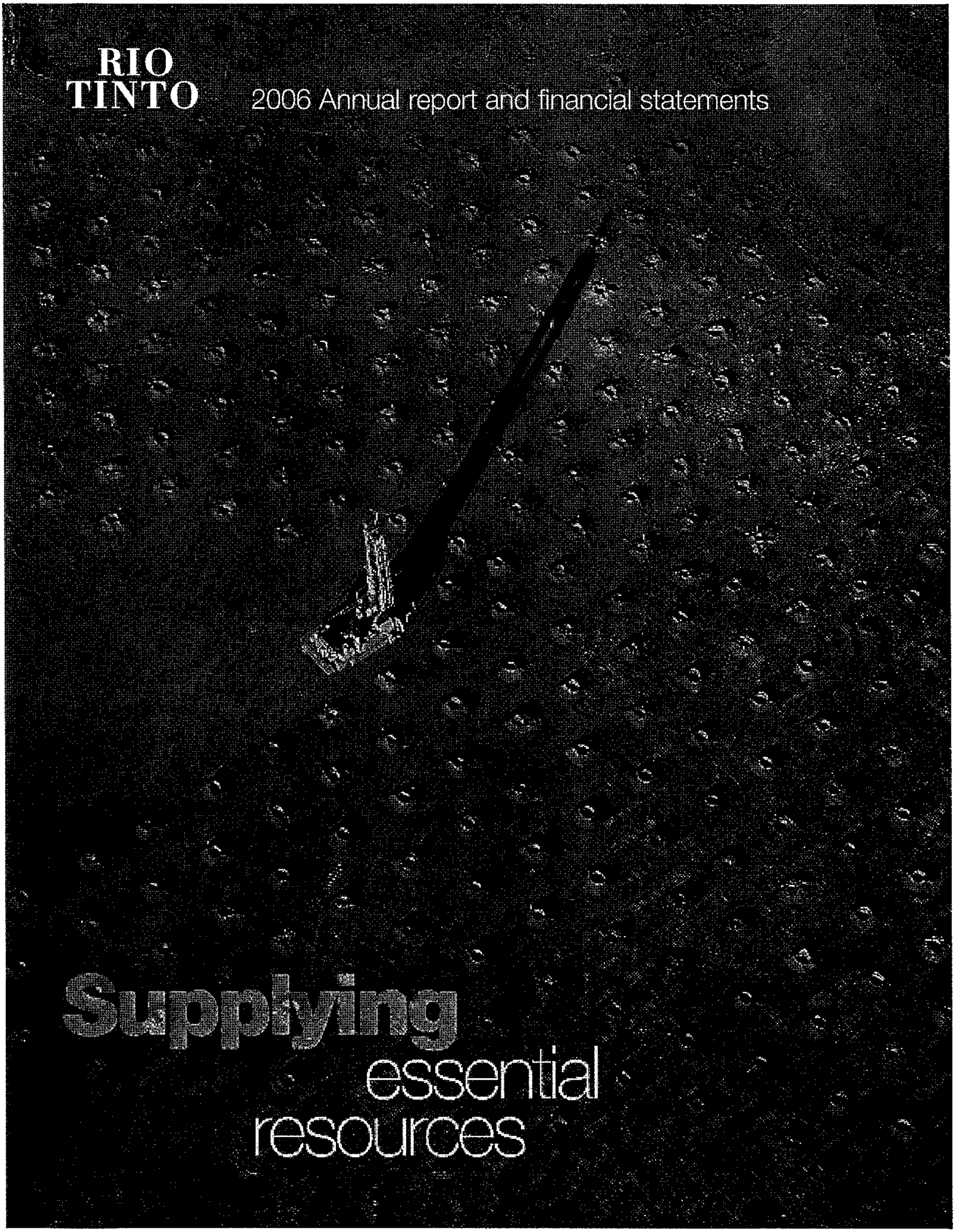
Thus, if there were synergies associated with common operation of the expanded network rather than a duplicated network, then the provider would choose to do that. In that situation, the test would argue that it is uneconomic to duplicate rather than augment the network.

The advantage of the test proposed here is that it can be asked and based on evidence from the provider as to how it would manage expansions in its own demand. If in its strategic documents there is no evidence that it would build a duplicate network to manage this demand, then the above test would force a regulator to conclude that the facility was, in fact, uneconomic to duplicate.

Attachment 5

RIO
TINTO

2006 Annual report and financial statements



Supplying essential resources

Metals and minerals production continued

		2004 Production (a)		2005 Production (a)		**2006 Production (a)**	
	Rio Tinto % share (b)	Total	Rio Tinto share	Total	Rio Tinto share	**Total**	**Rio Tinto share**
COPPER (mined) ('000 tonnes)							
Bingham Canyon (US)	100.0	263.7	263.7	220.6	220.6	**265.6**	**265.6**
Escondida (Chile)	30.0	1,207.1	362.1	1,270.2	381.1	**1,313.4**	**394.0**
Grasberg – FCX (Indonesia) (k)	–	396.4	5.5	–	–	**–**	**–**
Grasberg – Joint Venture (Indonesia) (k)	40.0	120.0	48.0	273.9	109.6	**115.5**	**46.2**
Neves Corvo (Portugal) (l)	–	46.9	23.0	–	–	**–**	**–**
Northparkes (Australia)	80.0	30.0	24.0	54.0	43.2	**83.3**	**66.6**
Palabora (South Africa) (m)	57.7	54.4	26.8	61.2	30.0	**61.5**	**31.1**
Rio Tinto total			753.1		784.4		**803.5**
COPPER (refined) ('000 tonnes)							
Atlantic Copper (Spain) (k)	–	58.4	7.0	–	–	**–**	**–**
Escondida (Chile)	30.0	152.1	45.6	143.9	43.2	**134.4**	**40.3**
Kennecott Utah Copper (US)	100.0	246.7	246.7	232.0	232.0	**217.9**	**217.9**
Palabora (South Africa) (m)	57.7	67.5	33.2	80.3	39.3	**81.2**	**40.9**
Rio Tinto total			332.6		314.5		**299.2**
DIAMONDS ('000 carats)							
Argyle (Australia)	100.0	20,620	20,620	30,476	30,476	**29,078**	**29,078**
Diavik (Canada)	60.0	7,575	4,545	8,272	4,963	**9,829**	**5,897**
Murowa (Zimbabwe) (n)	77.8	47	36	251	195	**240**	**187**
Rio Tinto total			25,202		35,635		**35,162**
GOLD (mined) ('000 ounces)							
Barneys Canyon (US)	100.0	22	22	16	16	**15**	**15**
Bingham Canyon (US)	100.0	308	308	401	401	**523**	**523**
Cortez/ Pipeline (US)	40.0	1,051	421	904	361	**444**	**178**
Escondida (Chile)	30.0	217	65	183	55	**170**	**51**
Grasberg – FCX (Indonesia) (k)	–	1,377	14	–	–	**–**	**–**
Grasberg – Joint Venture (Indonesia) (k)	40.0	207	83	1,676	670	**238**	**95**
Greens Creek (US)	70.3	86	61	73	51	**63**	**44**
Kelian (Indonesia)	90.0	328	295	43	38	**–**	**–**
Lihir (Papua New Guinea) (o)	–	599	87	424	61	**–**	**–**
Morro do Ouro (Brazil) (p)	–	188	96	–	–	**–**	**–**
Northparkes (Australia)	80.0	79	63	57	46	**95**	**76**
Rawhide (US)	51.0	50	25	35	18	**26**	**13**
Rio Tinto Zimbabwe (Zimbabwe) (q)	–	11	6	–	–	**–**	**–**
Others	–	13	7	15	7	**18**	**9**
Rio Tinto total			1,552		1,726		**1,003**
GOLD (refined) ('000 ounces)							
Kennecott Utah Copper (US)	100.0	300	300	369	369	**462**	**462**
IRON ORE ('000 tonnes)							
Channar (Australia)	60.0	9,759	5,855	8,644	5,186	**9,798**	**5,879**
Corumbá (Brazil)	100.0	1,301	1,301	1,410	1,410	**1,982**	**1,982**
Eastern Range (Australia)	(r)	2,970	2,970	6,559	6,559	**8,215**	**8,215**
Hamersley Iron (Australia)	100.0	65,407	65,407	74,387	74,387	**79,208**	**79,208**
Iron Ore Company of Canada (Canada)	58.7	11,139	6,541	15,647	9,188	**16,080**	**9,442**
Robe River (Australia)	53.0	48,459	25,684	52,385	27,764	**52,932**	**28,054**
Rio Tinto total			107,757		124,494		**132,780**

See notes on page 46