Review of Proposed Depreciation for ARTC Hunter Valley Rail Network Access Undertaking

(*Public Version*)

A report prepared
for the Australian Competition and Consumer Commission

Appendix E of this report contains information classified as confidential by the information providers and has been excluded from the public version.

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Executive Summary

1. Marsden Jacob Associates (MJA) was engaged by the Australian Competition and Consumer Commission (ACCC) to review the depreciation policy of Australian Rail Track Corporation's (ARTC) proposed Access Undertaking for the Hunter Valley Rail Network, and the Booz & Company (Booz) mine life methodology on which the policy's implementation is to be based.

2. MJA has concluded that ARTC's proposed use of the straight line method for the determination of depreciation is consistent with the practice adopted in the setting of regulated prices for access to infrastructure services in Australia, and its proposed depreciation of rail assets over the estimated remaining life of assets is also consistent with regulatory practice. ARTC's use of average mine life as a proxy for the remaining life of rail assets for the purpose of applying the straight line method of depreciation is reasonable, where coal represents the overwhelming majority of rail freight. However, the estimates of future mine production and reserves available for mining, which are used by Booz to estimate average mine life, contain substantial errors or are not based on information that was developed for application in the Booz methodology.

3. MJA found that much of the mine production and reserves data used by Booz was difficult to verify, in some instances because adjustments, which were not explained, had been made. Where verification was possible using reliable public domain information published by publicly listed mining companies in compliance with reporting obligations overseen by the Australian Securities Commission or Australian Bureau of Agricultural and Resource Economics (ABARE), substantial errors and inconsistencies was found in the Booz data. A detailed explanation of these errors and inconsistencies is provided in Section 4 of this report.

4. Briefly, MJA's most substantial findings on the Booz methodology which materially impact on the estimate of average mine life are:

    - The cumulative value of marketable reserves in the Booz report could be understated by as much as 33%,[1] although the magnitude of this discrepancy would have been reduced if Booz had included data for all mines identified by MJA.

    - The Booz production forecasts substantially exceed forecast coal exports published by ABARE - at or exceeding 100% of the ABARE export volume forecasts from 2014 through 2018.

- Briefly, other of MJA's findings on the Booz methodology which materially impact on the estimate of average mine life are:

    - Booz has not accounted for at least 16 currently operating mines or proposed mines that do, or would, access the Hunter Valley Rail Network.

    - Booz did not access the latest available data on marketable reserves when updating its estimates of average mine life.

[1] Information compiled by MJA shows that the Booz reserve estimate for mines owned by publicly listed companies who are required to publish JORC compliant is underestimated by as much as 33%. Assuming the same order of discrepancy observed by MJA exists for privately-owned mines, the Booz estimates of reserve could be underestimated by 33%.

- Coal production and reserves data for only 27 of the 46 mines and proposed mine developments used by Booz have been prepared in accordance with *Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* – generally referred to as the JORC Code. The preparation and administration of the JORC Code is, and has been, sponsored by the Australian mining industry and its associated professional organisations. It is widely accepted and used as providing a standard for the public reporting or mineral resources and ore reserves. The Code has been incorporated into the Listing Rules of the Australian and New Zealand Stock Exchanges, thereby mandating its use in reporting by publicly listed companies.
- Of these 27 mines and proposed mine developments for which the data have been prepared in accordance with the JORC Code, the marketable reserves data for 13 have been adjusted, by Booz, to 2008 levels, but the basis of this adjustment has not been disclosed.
- Booz has not established the consistency of production and reserves data it has obtained for the remaining 19 mines and proposed mine developments with the data for the 27 mines and proposed mine developments which have been prepared in accordance with the JORC Code.
- No information is provided in the Booz Report on the way in which Booz has converted the potential resources of proposed mine developments to marketable reserves.
- In response to questions from MJA, ARTC:
  - confirmed that where the data were available, Booz used the total of the JORC classifications Proved (marketable) reserves and Probable (marketable) reserves to establish marketable coal reserves (although the date at which that reserve data was published was not the latest available when the Booz report was finalised and published in February 2009);
  - advised that marketable coal reserves data for prior years were adjusted to 2008 levels by deducting annual production for each of the intervening years, but did not indicate whether Booz used actual production figures or estimates to make the adjustments; and
  - advised that Booz sometimes used estimates of 'conversion factors based on experience in the region' to convert total coal resource figures to estimates of marketable reserves, but did not disclose the conversion factors in each case and, in some cases, indicated that resource data were too speculative to allow reliable estimates to be made.
- MJA's comparisons of marketable reserves data used by Booz with information published by publicly listed mining companies reveals significant discrepancies; in each case a part of the difference can be explained by production during the period between the dates at which the data were compiled, but the magnitudes of the differences cannot be explained by production differences alone.
- Mine production forecasts are critical to the determination of average remaining mine lives, but the confidential nature of this data makes informed assessment of those forecasts difficult; and Booz has not provided any independent and publicly available evidence which can assist validation of estimates it has made from confidential data, such as coal export forecasts published by ABARE.

- Coal supplied to power stations has not been accounted for in the Booz mine production forecasts, which has the potential to impart a downward bias to remaining mine lives.
- When the estimated life of each of the mines in each segment is weighted by the contribution of the mine to total marketable reserves, mines with high reserves, high productions rates and relatively short lives will dominate the average weighted life; mines with lower reserves, lower production rates and relatively long lives will then require the services of the Hunter Valley Rail Network beyond the period for capital recovery set by the average weighted life.
- Linking the remaining life of rail assets to average mine life for those segments of the Hunter Valley Rail Network for which coal represents the overwhelming proportion of gross tonnage hauled is reasonable; however, the case for using average mine life when significant gross tonnages of other goods are hauled over rail segments also used for coal transport is not made in the Booz Report.

5. On the basis of the findings detailed in this report, MJA has concluded that the Booz estimate of average mine life does not provide a reasonable basis for establishing an estimate of the remaining life of rail assets for the purpose of implementing ARTC's proposed depreciation policy.

1. Introduction

1.1. Hunter Valley Rail Network

The Australian Rail Track Corporation Ltd (**ARTC**) provides services to train operators seeking access to the national interstate rail network. ARTC currently manages over 10,000 route kilometres of standard gauge interstate track in South Australia, Victoria, Western Australia and New South Wales.

In September 2004, ATRC leased certain parts of the rail network in New South Wales from the State Rail Corporation. The term of the lease is 60 years. The leased assets include the mainline, crossing loops, dual gauge track, and turnouts located between Newcastle, Muswellbrook, Ulan and Gap (together identified as the **Hunter Valley Rail Network**).

The Hunter Valley Rail Network primarily serves the coal industry in the Hunter Valley and adjacent areas.[2] Coal is transported, via the network, to the Kooragang Island and Port Waratah coal terminals for export, and five of the six power stations in the region (Bayswater and Liddell in the Hunter Valley; and Eraring, Vales Point and Munmorah south of Newcastle).[3]

Other goods are also transported over the Hunter Valley Rail Network. The most significant of these is grain from the agricultural districts of Central New South Wales, which is transported to export terminals at the Port of Newcastle.

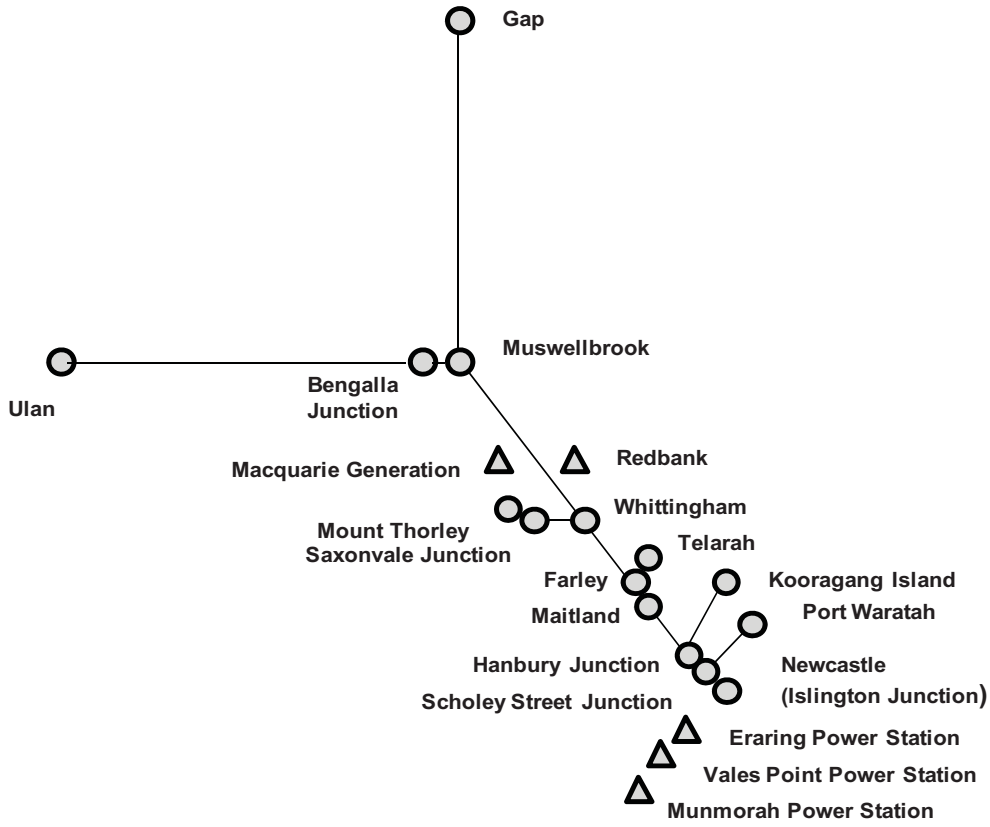
ARTC is of the view that the operation of, and the commercial arrangements for access to, the Hunter Valley Rail Network are significantly different from the operation of, and commercial arrangements for, the other rail assets which the company operates. In consequence, on 22 April 2009, ARTC provided to the Australian Competition and Consumer Commission (**ACCC**), for the ACCC's acceptance under section 44ZZA(3) of the *Trade Practices Act 1974*, the Hunter Valley Coal Network Access Undertaking (**HVAU**) in respect of access to services provided using the Hunter Valley Rail Network.

The extent of the Hunter Valley Rail Network is shown in schematic form in Figure 1 below. The schematic shows the rail network segments identified in Schedule E to the HVAU as comprising the Hunter Valley Rail Network.

[2] Coal from the Newcastle, Hunter and Gunnedah Coalfields, and from the northern parts of the Western Coalfield (around Ulan) and the Gloucester Basin (north of Newcastle), is transported via the Hunter Valley Rail Network.

[3] Redbank Power Station located near Singleton in the Hunter Valley has been converted to a fluidised bed boiler using coal washery fines. MJA understands that fuel is not delivered to Redbank using ARTC's assets.

Figure 1: Schematic of Hunter Valley Rail Network



Note: The New South Wales rail network extends beyond the limits of the Hunter Valley Rail Network shown in the schematic.

ARTC's *Explanatory Guide* describes the Hunter Valley Rail Network as including the following parts of the New South Wales rail network leased by the company:

- Islington to Maitland (coal lines only);
- Maitland to Dartbrook mine;
- Maitland to Craven mine[4] (forming part of the Sydney to Brisbane interstate corridor);
- Muswellbrook to Ulan mine; and
- Muswellbrook to Gap.[5]

Both coal and other goods are transported via the New South Wales Country Rail Network (which is operated by ARTC) to Gap, then via segments of the Hunter Valley Rail Network from Gap to Newcastle and other locations.

Clause 4 of the HVAU sets out ARTC's access pricing principles. The application of these principles requires, among other things, the calculation of depreciation for the assets comprising

[4] MJA notes that references in other ARTC documents states that the Maitland to Craven line is not included in the HVAU.

[5] *Hunter Valley Access Undertaking 2009 Explanatory Guide*, Australian Rail Track Corporation Ltd, undated.

the Hunter Valley Rail Network in accordance with rules set out in clause 4.6 of the HVAU. A key aspect of ARTC's proposed depreciation methodology is the use of the straight line method, with average remaining mine life adopted as a proxy for the remaining life of ARTC's Hunter Valley rail assets.

The average remaining mine life as proposed by ARTC is based on a report by ARTC's consultant Booz & Company (**Booz**). The report (**Booz Report**)[6] dated February 2009 sets out assessments of lives for coal mines accessing the Hunter Valley Rail Network, and the aggregation of these into average weighted mine life to be used as a proxy for the life of rail assets for the purpose of calculating depreciation. The Booz Report is part of ARTC's submission in support of its undertaking proposal. It does not form part of the HVAU itself.

Marsden Jacob Associates (**MJA**) was engaged by the ACCC to examine whether the depreciation policy, and mine life estimates and assumptions for ARTC's Hunter Valley Rail Network, based on the Booz Report, were reasonable. This required an understanding of ARTC's depreciation policy and detailed review of the methodology described in the Booz Report.

1.2. Marsden Jacob Associates' review

The findings from MJA's review are set out in section 4 of this report.

In section 2 of the report, MJA describes ARTC's depreciation policy. As noted above, this policy requires depreciation of the assets which comprise the Hunter Valley Rail Network over the remaining average life of the mines which produce coal that is transported over the network.

Implementation of ARTC's depreciation policy requires the estimates of the average weighted mine life of coal mines made by Booz. The methods and data used by Booz to make these estimates are reviewed in section 3.

Terms of reference for MJA's review are summarized in Appendix A.

As part of its work, MJA has considered whether ARTC's depreciation proposals are consistent with commercial practice. To inform its consideration of consistency, MJA has examined relevant commercial depreciation practice, including the depreciation practices of major mining companies that operate in the Hunter Valley, and the findings from this examination are summarised in Appendix B.

[6] *Mine Life Assessment – Hunter Valley Region*, Report for Australian Rail Track Corporation, Booz & Co, February 2009.

2. ARTC's proposed depreciation policy

2.1. Access prices and revenues

Clause 4 of the HVAU sets out ARTC's access pricing principles. In accordance with these principles, the revenue earned from any access holder, or group of access holders, at the prices which ARTC has negotiated with that access holder or group of access holders, must not exceed the economic cost of the rail network segments which are required on a standalone basis where the regulatory asset base (**RAB**) for those segments is equal to, or falls below, the RAB Floor Limit for those segments at the end of a calendar year (HVAU, clause 4.2(c)).

The economic cost of a segment is defined in clause 4.4 of the HVAU, and the segments themselves are listed in Schedule E. The segments aggregate into three non-overlapping pricing zones referred to as Pricing Zone 1, Pricing Zone 2 and Pricing Zone 3.[7] Broadly, the three zones extend from:

- Newcastle (Islington Junction) north west to Muswellbrook and Bengalla Junction (Pricing Zone 1);
- Bengalla Junction west to Ulan (Pricing Zone 2); and
- Muswellbrook north west to Gap (Pricing Zone 3).

For the purpose of applying the access pricing principles of the HVAU, the economic cost of a segment is to be the sum of:

(a) segment specific costs;

(b) depreciation of segment specific assets;

(c) return on segment specific assets;

(d) an allocation of non-segment specific costs;

(e) an allocation of depreciation on non-segment specific assets;

(f) an allocation of return on non-segment specific assets; and

(g) costs of the types described in (a) to (f) above, incurred in respect of additional capacity, including interest reasonably incurred during construction of that additional capacity.

The RAB for a segment at time *t* during the period of the HVAU is to be the sum of:

- the Existing Regulatory Asset Base (**ERAB**) for the segment at that time (the value, at that time, of segment assets which existed at the commencement of the HVAU); and
- the Investment Regulatory Asset Base (**IRAB**) of the segment at that time (the value, at that time, of new investment since commencement of the HVAU).

The initial RAB Floor Limit – the RAB Floor Limit at commencement of the HVAU – is to be the initial ERAB. At commencement, the value of the IRAB is zero (HVAU, clause 4.3(b)).

[7] The Booz Report refers to Region 1, Region 2 and Region 3. Booz appears to use these terms as synonyms for Pricing Zone 1, Pricing Zone 2 and Pricing Zone 3, respectively.

The RAB Floor Limit is, subsequently, to be adjusted annually ("rolled forward") to take into account prudent new capital expenditure, less any disposals, and depreciation of the asset base. Clause 4.3(d)(ii) requires that:

$$RAB\ Floor\ Limit_{t\ start} = (1 + CPI_{t-1}) \times RAB\ Floor\ Limit_{t-1\ start} + Net\ Capex_{t-1} - Depreciation_{t-1}$$

Depreciation is defined, in clause 9 of the HVAU, by reference to clause 4.6. Clause 4.6 sets out ARTC's proposed depreciation policy. In accordance with that policy (which is summarized in the next section of this report), depreciation is to be calculated using the straight line method.

Clause 4.2(c) of the HVAU then sets a limit on the access prices which ARTC may negotiate with prospective users of the Hunter Valley Rail Network when the RAB for a segment falls below the RAB Floor Limit for that segment. If the RAB for a segment is equal to, or below, the corresponding RAB Floor Limit, clause 4.2(c) requires that access revenues, at the negotiated access prices, not exceed economic cost.

Both the RAB Floor Limit for a segment and the economic cost of that segment are to be determined in a way which takes into account depreciation calculated in accordance with ARTC's proposed depreciation policy.

2.2. ARTC's proposed depreciation policy

ARTC's proposed depreciation policy, as set out in clause 4.6 of the HVAU, has five key elements:

- depreciation is to be calculated for each year on the opening balance of the RAB, and on 100% of the prudent capital expenditure on assets commissioned during a period of half[8] the year;
- unless another method has been agreed with an access holder or accepted by the ACCC, depreciation is to be calculated by applying the straight line method to specific assets, using the estimated remaining useful lives of those assets;
- the useful life of a segment or group of segments is to be determined having regard to:
  - the weighted average life of coal mines utilising the pricing zone of which the segment forms a part;
  - average mine production levels anticipated during the term of the HVAU having regard to the coal chain capacity at any time; and
  - marketable coal reserves estimated for each mine existing at the time of the determination, or expected to commence production during the period of five years following the determination;
- the weighted average mine life for coal mines utilising a pricing zone may, with the approval of the ACCC, be varied between pricing zones; and
- the estimates of remaining mine lives are to be reviewed by ARTC five years from the date of commencement of the HVAU and, if necessary, revised estimates will be proposed for ACCC approval.

[8] That is, all capital expenditure incurred through a year is assumed, for the purposes of calculating depreciation, to occur as a single lump sum in the middle of the year.

2.3. MJA's initial views

Depreciation, for both the RAB Floor Limit and economic cost, is to be determined in accordance with ARTC's proposed depreciation policy. Unless another method has been agreed with an access holder or accepted by the ACCC, the proposed depreciation policy requires that depreciation be calculated by applying the straight line method to "specific assets". The proposed depreciation policy of clause 4.6 of the HVAU implies that these specific assets are the assets which comprise each of the segments of the Hunter Valley Rail Network. In applying the straight line method, these assets are to be depreciated over their estimated remaining useful lives.

ARTC's proposed use of the straight line method for the determination of depreciation is consistent with the practice in the setting of regulated prices for access to infrastructure services in Australia. Moreover, straight line depreciation using the estimated useful lives of assets is also consistent with regulatory practice. Australian regulatory practice allows for the recovery of asset value over the period during which users of the services provided require those services, rather than over the period during which the assets in question have the potential to provide services. That is, depreciation is usually calculated using the economic lives of assets rather than their technical or engineering lives (which may be longer than the economic lives).

If access prices are to provide signals for efficient investment in, and efficient use of, the services provided by infrastructure assets, the depreciation which goes into their calculation – or, in the case of the assets which comprise the Hunter Valley Rail Network, which effectively constrains the prices which ARTC can negotiate – should not place an unnecessarily high burden on current users of the network. Nor should prices preclude users in the future contributing to the costs of the assets which are used to provide them with service.

The principal – but, as will be further discussed later in this report, not the only – service provided by the Hunter Valley Rail Network is the track service required for the transport of coal to the Hunter Valley and Newcastle area power stations, and to the coal export terminals at Kooragang Island and Port Waratah. The period over which this service is likely to be required by users will be determined by the life of the coal resource in the Hunter Valley and adjacent regions.[9] In turn, the life of the coal resource will depend on the cumulative demand for coal, the magnitude of the total coal resource that is economic to mine, the cost of mining, coal preparation and transport and the 'market price' of coal. Pending further consideration of the issue in the next section of this report, use of the life of the coal reserve and production rates to estimate a proxy for the economic life of assets which comprise the Hunter Valley Rail Network to be used in applying the straight line method of depreciation appears reasonable.

In using the straight line method, an assumption is made that the level of service provided by the rail assets does not vary much from one year to another during the life of those assets. However, this may not be the case. The life of the assets – in particular, the life of the rail itself – will be affected by the gross tonnage hauled over the network, and that gross tonnage may vary significantly from year to year. This is indicated by the depreciation practices of the mining companies examined in Appendix B, all of whom own or operate coal mines in the areas

[9] Coal transported on the Hunter Valley Rail Network originates from mines in:

- the Newcastle Coalfield, Hunter Coalfield and northern part of the Western Coalfield – all of which are delineated areas of a geological structure called the Sydney Basin;
- the Gunnedah Coalfield in the southern part of a geological structure called the Gunnedah Basin; and
- a geological structure called the Gloucester.

serviced by the Hunter Valley Rail Network. All of those companies use the units-of-production method of depreciation, rather than the straight line method, for their mining properties. The use of the units-of-production method allows the mining companies to reflect variability in production, driven by conditions in domestic and international markets for coal, in their recovery of asset value.

Neither future mine production, nor the coal available for mining, are fixed quantities. The total coal resource in the Hunter Valley and adjacent coalfields is very large compared to annual total production. Figures collated by MJA (summarised in Appendix C) show that total coal resources in areas mined by major publicly listed mining companies[10] exceed 17 billion tonnes. As indicated above, the magnitude of the total coal resource that is available for mining (termed 'coal reserves')[11] depends on the cost of mining, coal preparation and transport and the market price of coal. The total 'coal reserve' is always significantly less than the total coal resource because not all coal is economic to mine; and some of the coal that is actually mined will not meet required product quality requirements. Nevertheless, the total available 'coal reserve' in areas serviced by the Hunter Valley Rail Network is substantial. The NSW Department of Primary Industries estimates the total recoverable coal reserve in the Hunter, Gloucester, Gunnedah, Newcastle and Western Coalfields at 30 June 2008 to be some 9.4 billion tonnes.[12] By comparison, the annual production from mines in these Coalfields in 2007/08 is reported to total 164Mt/y.[13] But not all of the coal produced is transported on the Hunter Valley Rail Network. Around 24% is lost in the coal preparation process to produce 125Mt/y of 'saleable coal' (or 'marketable coal'); and a significant quantity of the approximately 24Mt/year[14] supplied to the six power stations in the Hunter Valley and Newcastle areas is transported by road or conveyor direct from the mines to power station coal stockpiles.

The uncertainty created by volatility in prices and production (primarily for export coal) is recognised in the depreciation methods of the mining companies examined in Appendix B. A number of the companies explicitly state that their estimates are periodically reviewed and, if necessary, adjusted on a prospective basis. The same issues of uncertainty arise for ARTC if it uses the remaining life of the coal reserve to estimate the economic life of assets which comprise the Hunter Valley Rail Network. ARTC proposes to address this uncertainty through a review of remaining mine lives five years from the date of commencement of the HVAU. This seems to MJA to be entirely reasonable.

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10 The publicly listed companies account for approximately 2/3rd of total coal transported on the Hunter Valley Coal Network. MJA has used data published by these companies because the information is subject to compliance with financial market information disclosure rules. Coal resources accessible to private companies (that are not required to publicly disclose resource and reserve data) would increase this figure by some billions of tonnes.

11 That part of a coal resource in the vicinity of an individual mine or mining lease that is economic to mine (using currently available technologies and at prevailing costs and prices) is termed a 'coal reserve'.

12 Table 1, p. 3, *2009 NSW Coal Industry Profile*, NSW Department of Primary Industries, August 2009.

13 Table 3, p. 9, *Ibid.* Note that not of the coal produced is transported on the Hunter Valley Rail Network. Around 24% is lost in the coal preparation process to produce 125Mt/y of 'saleable coal' (or 'marketable coal'); and a significant quantity is transported by road or conveyor to some of the six power stations in the Hunter Valley and Newcastle areas.

14 Total coal supplied to the Hunter Valley and Newcastle area power stations in 2007/08 is reported as 23.44Mt in the *2009 NSW Coal Industry Profile* (p. 151).

3. Application of the ARTC depreciation policy

3.1. The Booz methodology

ARTC's proposed depreciation policy requires the use of straight line depreciation for the rail network segments comprising the Hunter Valley Rail Network, with segments depreciated over their estimated remaining useful lives. Those remaining useful lives are to be estimated from the average remaining lives of the Hunter Valley coal mines which produce the coal transported over the segments. The average remaining mine lives are, in turn, to be determined from:

- average mine production levels anticipated during the term of the HVAU (and beyond), having regard to coal chain capacity; and
- the marketable coal reserves of mines existing at the time of the determination, or expected to commence production during the period of five years following the determination.

Determination of the average remaining mine lives, from production levels and reserves estimates, was undertaken for ARTC by Booz. Booz's methodology advanced the use of average weighted mine life derived from:

- a list of the mines and proposed[15] mine developments in the Hunter Valley and adjacent areas which produce coal, or which would produce coal if developed, for transport via rail assets in each of ARTC's three Pricing Zones;
- an estimate of marketable coal reserves for each individual operating mine or proposed mine development at 2008;
- an estimate of the annual production of marketable coal for each year to 2024 (that is, for each of the 16 years from 2008) for each of the mines listed by Booz;
- the capacity constraints in the coal supply network; and
- weighting of the expected mine lives, based on forecast cumulative production of each mine.

3.2. Hunter Valley mines and proposed mine developments

Booz's estimates of remaining mine life are for the coal mines and proposed mine developments listed in Annex A of the Booz Report. The mines and proposed mine developments are classified as being within each of three regions:[16]

- Region 1: mines located on track sectors south of Muswellbrook;
- Region 2: mines located on track sectors west of Muswellbrook; and
- Region 3: mines located on track sectors north west of Muswellbrook.

A summary of the numbers of mines in each category (operating and proposed) from the Booz list is presented in Table 1 below.

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15 Booz uses the term 'prospective' for possible future mines. MJA has adopted the term 'proposed' on the basis that at least some, and possibly many, of these proposed developments are certain to proceed so long as there is continuing demand for coal.

16 MJA has accepted that the Booz 'Regions' are the same as the ARTC 'Pricing Zones'.

Table 1: Summary of Booz Mine Classifications

Zone	*Status*		
	Operating	*Proposed*	*Total*
1	27	1	28
2	3	3	6
3	5	7	12
Total	35	11[1]	46[2]

Source: Booz Report Annex A.
Notes:
1. *Annex A of the Booz Report shows only 3 'prospective mines', all in Region 3. The number of 'Proposed mines' in Table 1 are mines with zero annual production in 2008 in the Booz model dataset.*
2. *The Sandy Creek mine is listed as an operating mine in Region 1 in Annex A, but is not listed in other tables of the Booz Report and is not included in the Booz model dataset. MJA has confirmed that Sandy Creek is a proposed mine development owned by Idemitsu.*

In verifying the mines and proposed mine developments which are expected to produce coal transported via the Hunter Valley Rail Network during the period of the HVAU, MJA found:

- some of the mines, listed as being in Region 3, are located north west of Gap – with output from these mines transported by ARTC onto the Hunter Valley Rail Network at Gap;
- several mines, listed as being in Region 1, are located near Gloucester – with output from these mines transported onto the Hunter Valley Rail Network at Maitland;
- other mines are located south of Newcastle – with output transported onto the Hunter Valley Rail Network at Islington; and
- 17 additional mines or proposed mines (16 in Pricing Zone 1 and one in Pricing Zone 3) which are not listed in Annex A of the Booz Report.

In respect of the additional mines, MJA sought advice from the New South Wales Minerals Council (NSWMC) as to the operating status of all mines and which mines would have access to and use, or might be expected to use, the Hunter Valley Rail network for the transport of coal. The NSWMC response is presented in Appendix D. In summary, the NSWMC confirmed 15 of the 17 additional mines or proposed mines identified by MJA[17] and also identified a further seven mines or proposed mines.

A summary comparison of the Booz, MJA and NSWMC data is shown in Table 2 below. Using the mine status and mine details advised by NSWMC shows:

- of the mines classified by Booz as operating mines two were closed (Camberwell and Teralba in Zone 1) and three were proposed mines (Saddlers Creek in Zone 1, Ulan West in Zone 2 and Sunnyside in Zone 3); and
- of the mines classified by Booz as 'prospective mines' one (Canyon, formerly Whitehaven in Zone 3) was an operating mine.

[17] The remaining 2 mines identified by MJA were *Grant & Chainey* which is listed as an open cut mine in the Gloucester Coal 2008 Annual Report as well as in the 2009 Resource and Reserves Update, and is located north of Duralie Mine (also owned by Gloucester Coal); and *Blue Vale* which is owned by Whitehaven Coal and located between Gunnedah and Narrabri, near Boggabri (Whitehaven Coal Annual Report 2008, p. 32, 33).

Table 2: Summary of mine status (NSWMC Classifications)

Zone	*Booz*					*MJA*			*NSWMC*			*Total*
	Cl	*Op*	*Pr*	*TC*	*UC*	*NK*	*Op*	*Pr*	*Op*	*Pr*	*UC*	
Region 1	2[1]	22	3[2]			1	10	5	1	3	1	48
Region 2		3	3		1					2		9
Region 3		5	6	1		1						13
Total	**2**	**30**	**12**	**1**	**1**	**2**	**10**	**5**	**1**	**5**	**1**	**70**

Source: MJA review of public domain documents published by publicly listed mining companies and NSWMC response to MJA's query.

Abbreviations: Cl: Closed, Op: Operating Mine, Pr: Proposed Mine, UC: Under Construction, TC: Temporarily closed, NK: Not known to NSWMC.

Notes:
1: NSWMC advised that Camberwell and Teralba were no longer operating mines.
2: Includes Sandy Creek.

Of the 24 additional mines identified by MJA and NSWMC:

- one of the proposed mines (Wallarah No. 2 in Zone 1) will supply coal direct to a power station and not access ARTC assets for coal transport; and
- five of the operating mines (Chain Valley, Mandalong, Mannering, Westside and West Wallsend – all in Zone 1) supply coal direct to power stations and do not access ARTC assets for coal transport.

MJA concluded that the above six mines or proposed mines could reasonably be excluded from the Booz data set on the basis that these mines or proposed mines do not, or would not, access ARTC assets. However, Booz included one mine (Ravensworth West/Narama in Zone 1) in its list when the information provided by NSWMC shows this mine does not access ARTC's assets for transport of coal.[18]

In addition, a further two mines (Beltana and Blakefield classified as Operating and Under Construction respectively) where identified by NSWMC as being part of the Bulga Mine complex. These two mines may have been covered in data that Booz adopted by the Bulga Mine.

MJA concluded that Booz has erred by not including all of remaining 16 mines or proposed mines that do, or would, access the Hunter Valley Rail Network in its analysis of average mine life. That is, the appropriate number of mines that should have been included in an assessment of average mine life is at least 62, not the 46 included in the Booz Report.

3.3. Marketable coal reserves

ARTC's proposed depreciation policy requires that average remaining mine lives be derived from estimates of the marketable coal reserves of each individual operating mine or proposed

[18] Note that MJA independently checked information provided by the NSWMC by reference the *2009 NSW Coal Industry Profile*.

mine development. However, the term 'marketable reserves' is not defined in either the HVAU or the Booz Report.

In the coal industry, the term 'marketable' coal usually refers to the product actually shipped from a mine after the treatment of 'run-of-mine' coal in a coal preparation plant. The coal preparation process removes soil contaminants and fines from coal that is crushed to standard sizes to produce coal products that are more convenient to store and transport, and which have the clearly defined and measurable properties required for particular applications.

Booz's approach to determination of marketable coal reserves in described in section 3.3 of the Booz Report:

> *Mine Reserve data is calculated at 2008 levels and is based on the latest assessments of coal reserves. Estimates of mineral reserves are sourced from JORC based public estimates that are adjusted to ensure a common 2008 baseline. AME Mineral Economics data is used to determine where either the mine reserves are not public or the data provided is older than the AME data set. Mine Reserve data is Annex B.*

Annex B to the Booz Report notes:

- AME Mineral Economics provided data on marketable coal reserves for 15 of the 46 mines and proposed mine developments for which remaining mine lives were estimated;
- marketable coal reserves for 27 of the 46 mines and proposed mine developments were obtained from public sources (13 from the *New South Wales Coal Industry Profile 2006*, and 14 from information available from company websites);
- for four of the mines and proposed mine developments, estimates of marketable reserves were made by the study team; and
- three of the four estimates made by the study team were made for proposed mine developments by converting potential resources into marketable reserves.

Data sourced from the *New South Wales Coal Industry Profile 2006* were adjusted, by Booz, to account for actual production between the assessment date and 2008.[19]

The Booz Report indicates that the reserve estimates obtained from public sources were JORC based estimates. That is, they were estimates prepared in accordance with the *Australian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves* – generally referred to as the JORC Code. The JORC Code has been prepared by the Joint Ore Reserves Committee of The Australasian Institute of Mining and Metallurgy, Australian Institute of Geoscientists and the Minerals Council of Australia. The preparation and administration of the JORC Code is, and has been, sponsored by the Australian mining industry and its associated professional organisations. It is widely accepted and used as providing a standard for the public reporting or mineral resources and ore reserves. The Code has been incorporated into the Listing Rules of the Australian and New Zealand Stock Exchanges, thereby mandating its use in reporting by publicly listed companies.

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[19] Footnote 14 to Annex B of the Booz Report.

MJA notes that the Booz Report is dated February 2009. It is not clear why Booz did not refer to the then current *2008 NSW Coal Industry Profile* for 'the latest assessment of coal reserves'.

The JORC Code:

- sets minimum standards for public reporting (in Australia and New Zealand) of exploration results, mineral resources and ore reserves;
- provides a mandatory system for classification of tonnage/grade estimates according to geological confidence and technical/economic considerations;
- requires public reports to be based on work undertaken by a Competent Person, and describes the qualifications and type of experience required to be a Competent Person; and
- provides extensive guidelines on the criteria to be considered when preparing reports on exploration results, mineral resources and ore reserves.

The particular clauses of the JORC Code which are relevant to the estimation of marketable coal reserves are:

- clause 29 - definition of 'Probable Ore Reserve';
- clause 30 - definition of 'Proved Ore Reserve'; and
- clause 39 - definition of 'Marketable Coal Reserves'.

MJA accepts that estimates of marketable coal reserves which have been prepared in accordance with the JORC Code are reasonable estimates for the purpose of assessing average remaining mine life. However:

- data for only 27 of the 46 mines and proposed mine developments which have been used by Booz appear to have been prepared in accordance with the JORC Code;
- of these 27 mines and proposed mine developments for which the data have been prepared in accordance with the JORC Code, the marketable reserves data for 13 have been adjusted, by Booz, to 2008 levels, but the basis of this adjustment has not been disclosed in the Booz Report; and
- no information is provided in the Booz Report on the way in which Booz has converted the potential resources of proposed mine developments to marketable reserves.

In response to questions from MJA, ARTC:

- confirmed that where the data were available, Booz used the total of the JORC classifications *Proved (marketable) reserves* and *Probable (marketable) reserves* to establish marketable coal reserves;
- advised that marketable coal reserves data for prior years were adjusted to 2008 levels by deducting average historical production figures[20] for each of the intervening years; and
- advised that Booz sometimes – *'based on experience in the region*' – used estimates of conversion factors to convert total coal resource figures to estimates of marketable reserves or included nominal amounts *'to reflect some possible identification of resources and reserves in the future'*. However, ARTC did not disclose the detailed methodology used by Booz for adjustment in each case and, in some cases, indicated that resource data were too speculative to allow reliable estimates to be made.

[20] ARTC provided Booz with actual annual production figures for the years 2003 to 2007 for Bulga O/C, Donaldson O/C, Mount Owen Complex O/C, Rixs Creek O/C, Wambo (North) U/G and Wambo O/C.

To assess the appropriateness of the marketable coal reserves data adopted by Booz, MJA compared the Booz figures with the 2008 reserves data reported in annual reports and/or 'updates' for investors published by publicly listed mining companies that own or operate mines in areas serviced by the Hunter Valley Rail Network.[21]

An example of this comparison for three of these mines – Bulga, Cumnock and Mount Owen – owned by Xstrata, which is listed on the Australian Securities Exchange, is illustrated in Table 3 below.

Table 3: Differences in estimates of marketable reserves for 30 June 2008

Mine	*Booz Estimate*[1]	*Xstrata published data*[2]		*Difference*[3]
	(Mt)	*Proved (Mt)*	*Probable (Mt)*	*(Mt)*
Bulga	79.4	132.7	30.5	-83.8 to -53.3
Cumnock	1.0	1.1	163.4	-163.5 to -0.1
Mt Owen	209.9	36.0	15.7	158.2 to 173.9

Notes:

1. *Source: Booz Report Annex B.*
2. *Xstrata Ore Reserves and Mineral Resources, January 2009, available at http://www.xstrata.com/assets/pdf/x_reserves_resources_coal_20090129.pdf.*
3. *Difference is expressed as a range, dependent on whether probable reserves are taken into account in the Booz estimates.*

This comparison illustrates significant differences between the Booz estimates of marketable coal reserves, and the reserves data published by mine owners. These differences may be due, in part, to Booz's use of 2006 estimate of marketable coal reserves, and its adjustment, using actual annual production, of the 2006 estimates to 2008 levels. However, the size of the differences shown in Table 3 cannot be explained by the production adjustments alone.

The Booz estimates of marketable coal reserves for the Cumnock mine (which Booz attribute to AME Mineral Economics) are within 10% of figures for Proved reserves published by Xstrata. This suggests that Booz used the Proved reserve category alone to estimate the remaining mine life for this mine. However, the figures for Bulga and Mt Owen (also attributed by Booz from AME) are very substantially different to those published by Xstrata – and are not consistent with this interpretation.

To better understand these differences, further information on the marketable coal reserve estimates was sought from ARTC. In a response submitted to the ACCC, ARTC advised that:

> *ARTC is not aware of where such discrepancies are. Nevertheless, there could be a number of reasons for this described as follows.*
>
> - *Data currently available to the ACCC consultant is likely to relate to current publicly available estimates as opposed to estimates that may have been available to Booz (likely to be circa 2006, 2007 or early 2008). In the current volatile climate, estimates of marketable reserves can swing significantly between years.*

[21] MJA notes that these companies are identified in the ARTZ *Explanatory Guideline* and that all data located by MJA had been published by the companies prior to the date of the Booz Report (February 2009).

- *Sources currently available may specify resources and reserves information differently (ie marketable reserves may now be separately identified but not previously).*
- *More generalised sources (as opposed to company data) such as those used by Booz may report resources and reserves on a different basis.*[22]

As noted earlier in this report, the Booz Report is dated February 2009, and the Xstrata reserves data shown in Table 3 were publicly available by then.

Furthermore, MJA agrees with ARTC's view that '*estimates of marketable reserves can swing significantly between years*'. These significant swings in marketable reserves estimates are explained by the way in which the coal mining companies typically operate.

Coal mining, using either open cut or underground methods, does not rely on particularly complicated technology. It can be considered as a 'bulk materials handling' process which can be applied anywhere that sufficient coal is accessible to allow production to occur at costs below the price that customers are willing to pay. Through exploration and the 'proving up' of reserves, mining companies establish resources which can be economically mined. This does not require delineation of the total coal resource in a region.

Mining takes place in accordance with a detailed mine plans for parts of the available resources which have been identified as marketable reserves. The scope of a mine plan is limited by expectations about the market for the coal produced, and by the investment required to mine coal over a limited period (typically linked to the technical life of major mining plant).

Mining depletes existing marketable reserves, and further exploration and the proving up of reserves are, therefore, integral parts of mining operations. When existing resources are insufficient to meet future requirements, mining companies identify further marketable reserves and new mine plans are implemented to access those reserves. Through this ongoing process of mine development, estimates of the marketable reserves for the coal producing regions serviced by the Hunter Valley Rail Network can change significantly from year to year.

ARTC also advised that it had sought to respond to the request for further information on marketable coal reserves by undertaking its own review of publicly available sources in order to ascertain whether there were any discrepancies in the Booz estimates. This further review examined, primarily, information available on company websites. Where website data were not available, ARTC examined data from the *NSW Coal Industry Profile 2008* (which provides reserve estimates for 2006). ARTC concluded that its own review indicated the following:

- *For the majority of mines, the reserves estimate aligned reasonably well with published information in 2007, which is likely to have formed the basis of much of Booz research at the time. The differentials between the Booz estimates and 2007 publicly available information do not show any systemic bias towards lower or higher estimates. On balance, there seems to be as many over-estimates as under-estimates.*
- *Booz have sought to adjust for differences in the currency of estimates and 1 July 2008 by applying historical levels of coal transported over the relevant period, as advised by ARTC.*

[22] *Australian Rail Track Corporation Ltd Hunter Valley Access Undertaking. ARTC response to ACCC request for information in relation to ARTC's proposed Hunter Valley remaining mine life assessment (confidential)*, ARTC, under cover of letter to the ACCC dated 6 July 2009.

- *There have been a number of re-assessments of the reserve estimates by companies between 2007 and 2008. This could be expected given the present volatility in the market. Given movements in coal prices between 2008 and 2009, one could expect further movement, possibly downwards.*
- *In relation to those Booz estimates that have been highlighted ..., there would seem to be a greater discrepancy (although in many cases, Booz estimates are higher than publicly available information would suggest). Nevertheless, ARTC has sought a response from Booz in relation to the apparent discrepancies between the reserves assumption and advice publicly available for these mines. ARTC has adopted this more focussed review in order to keep the exercise reasonably tractable in the circumstances. Despite some limitations in relation to information availability as advised by ARTC, the following advice has been provided by Booz.* [The advice provided by Booz is set out in Table 4 and discussed below.]

ARTC summarised its view of the discrepancies, and their implications, as follows:

- *A summary of the above discrepancies shows that the Booz assumptions result in a substantial over-estimate of Marketable Reserves for these mines. An over-estimate of reserves would result in a longer remaining mine life, all other things being equal. ARTC would expect that aligning reserve estimate to publicly available information would significantly reduce the remaining mine life estimates (3-4 years).*
- *An estimate of remaining resources and reserves, to the extent that it should be reasonably included in a remaining mine life calculation can be somewhat subjective.*
- *The shortfall in Marketable Reserves identification be taken as a conservative 'buffer' in consideration of the subjectivity involved in identifying the appropriate level of resources and reserves for this type of assessment.*[23]

ARTC stated in its response that it *'is not proposing to revise its proposals downwards'.*

The further advice provided by Booz, to which ARTC refers in its 6 July response to the ACCC, is summarised in Table 4 below. Also included in this table, for comparison, are data obtained by MJA for those mines which are owned by publicly listed companies (for which ore reserves and minerals resources information, prepared in accordance with the JORC Code, are reported in public domain documents).

[23] See *ARTC response to ACCC request*, 6 July 2009.

Table 4: Summary of ARTC response on marketable reserves (in Mt)

Mine/ Proposed Mine Development (P)	***Booz Original***	***ARTC Review***	***MJA data***	***Summary of ARTC/Booz comments (MJA has added a response as indicated)***
Hunter Valley South	300	102	None available	Transcription error.
Maules Creek (P)	300	100	398 (total resource)	Conversion factor of 30% applied to projected resources of 1000 Mt to estimate marketable reserves. *MJA response: Compare with comments relating to Saddlers Creek, Dartbrook, Caroona and Watermark below.*
Bulga/Beltana	77	164	163.2[a]	Indicates that Booz intended the use of proved plus probable figures as marketable reserves.[b]
Mt Owen (complex)	210	97	96.9[c]	Double count of volumes attributed to Ravensworth East and Glendell, two of the three mines in the Mt Owen Complex.[d]
Rix's Creek	35	64 (reserves at June 2006)	None available	*NSW Coal Industry Profile 2008* shows 64 Mt reserves as at 30 June 2006. Booz estimate based on 2003 AME Mineral Economics data,[24] adjusted to 2008 by subtracting estimate production from 2003.
Narrabri (P)	300	172	102.7 [e]	Update based on 'more recently available information'.
Donaldson	16	8	None available	*NSW Coal Industry Profile 2008* shows 8 Mt marketable reserves as at 30 June 2006. Compares with significantly higher AME Mineral Economics data as at 1 January 2006.
Saddlers Creek	25	536.8 (total resource)	536.8 (total resource)	Identified as exploration project only. Inclusion of a nominal amount to reflect some possible conversion of published resources identified through exploration to marketable reserves. *MJA response: It is unclear why the nominal amount of marketable reserves is set at 25Mt, Using a methodology similar to the one applied to Maules Creek would lead to marketable reserves of 161 Mt.*
Dartbrook (P)	43.5	222 (total resource)	222 (total resource) (Operations	Existing operations placed on care and maintenance. Inclusion of a nominal amount to reflect possible conversion of published resources identified through exploration to marketable reserves.

[24] ARTC advised that original data attributed to AME Mineral Economics was confidential. The actual values were included in ARTC's response, but have been excluded from this report because the values were classified by ARTC as 'confidential' and because disclosure of the actual does not affect the conclusions drawn by MJA.

Mine/ Proposed Mine Development (P)	***Booz Original***	***ARTC Review***	***MJA data***	***Summary of ARTC/Booz comments (MJA has added a response as indicated)***
			ceased 2006)	*MJA response: It is unclear why the nominal amount of marketable reserves is set at 43.5 Mt, and not 25 Mt similar to Saddlers Creek. Moreover, using a methodology similar to the one applied to Maules Creek would lead to marketable reserves of 67 Mt.*
Wambo	102	222 (recoverable reserves)	None available.	*NSW Coal Industry Profile 2008* shows 150 Mt marketable reserves as at 30 June 2006. Booz estimate based on AME Mineral Economics data for Wambo O/C and Wambo North (U/G) as at 31 December 2003, adjusted to 2008 by subtracting estimate production from 2003.
Mt Arthur	228	168	168	Booz estimate was aligned to Total Reserves for the Mt. Arthur operating mine and project identified by the company as at 30 June 2008.
Caroona (P)	100	None available	None available	Site undergoing exploration and feasibility assessment. No reserve estimates publicly available. Assumption represents a rough estimate intended to include a nominal amount to reflect some possible identification of resources and reserves in the future. Cited (as reason) not to recommend inclusion of this long term proposed development in mine life assessment. Review of remaining mine life in 5 years as provided under the HVAU represents an opportunity to establish a credible basis upon which to assess mine life in relation to this project.
Watermark (P)	100	None available	1,000 initial estimate of thermal coal.[f]	

Notes:

(a) From Xstrata Annual Report 2008, page 77.
(b) MJA notes that in other cases, Booz has adopted figures close to proved marketable reserve values only, even when probable marketable reserve values are published. This may be another type of 'transcription error'.
(c) From Xstrata Annual Report 2008, page 77. Note: Mt Owen is classified as OC/UG in the Xstrata data.
(d) The three mines are listed separately in the Booz report as Glendell, Mt Owen and Ravensworth East.
(e) Available from http://www.whitehaven.net.au/pages/projects/narrabri/index.php. Note: the Whitehaven Coal website refers to Narrabri North and Narrabri South, but only quotes reserve figures for Narrabri North.
(f) China Shenhua Energy Company Annual Report 2008, page 10.

As noted earlier, Booz attributed marketable reserve values to data provided by AME Mineral Economics for 15 of the 46 mines and proposed mine developments for which remaining mine lives were estimated by Booz and data for a further 13 mines and proposed mine developments were obtained from the *2006 New South Wales Coal Industry Profile*. MJA has no information to establish the basis on which AME Mineral Economics collect and collate information on coal production, resources and reserves. A 'disclaimer' in the *2009 New South Wales Coal Industry Profile* states:

> *The information in this document is as complete and accurate as possible at the time of compilation (May 2009). However, mine personnel change and companies themselves may move or change name as operating company or mine ownership or mine ownership changes. While all care has been taken in producing this document, the NSW Department of Primary Industries accepts no responsibility where information is incorrect.*[25]

MJA has no information to establish whether any audit process, or formal quality assurance procedure, has been applied to the information systems used to collect information, or to the information provided, by either the Department or AME Mineral Economics. However, it is unlikely that such processes, even if they are applied, would identify all deficiencies in information that is, in effect, provided on an 'all care and no responsibility' basis.

An outcome that is not unexpected under such circumstances is exhibited in ARTC's response in respect of information provided for the Donaldson mine (see Table 4 above). ARTC advised that the *2008 New South Wales Coal Industry Profile* shows marketable reserves of 8 Mt at 30 June 2006, while the AME Mineral Economics estimate as at 1 January 2006 is substantially higher. The discrepancy in data from these two sources cannot be due to the different reporting dates. Using the actual annual production in 2006 (provided by ARTC) to adjust the AME Mineral Economics estimate does not resolve the difference in data from these two sources. A second, and even more unsatisfactory outcome, also noted in Table 4, arises in the case of the Wambo mine. ARTC advised that the *2008 New South Wales Coal Industry Profile* reported marketable reserves for Wambo of 150Mt in June 2006, a significantly higher amount than the AME Mineral Economics had reported at 31 December 2003. Booz adjusted the AME Mineral Economics estimate based on actual annual production to derive its estimate of 102 Mt.

ARTC's interpretation of marketable coal reserve data for both Donaldson and Wambo has the effect of reducing the average remaining mine lives and, therefore, increasing depreciation.

Appendix C shows all information on coal mines collated by MJA. As noted elsewhere in this report MJA relied on public domain documents published by publicly listed mining companies that must comply with the Australian Securities & Investments Commission's reporting requirements. This information identified a total of 62 mines or proposed mines[26] that did or would access the Hunter Valley Rail Network. Of these, reliable public domain sources provided estimate of 'marketable reserves' for 43 mines or proposed mines (totalling just over 3,000Mt). Twenty six of the mines identified by MJA are amongst the 46 mines or proposed mines listed by Booz.

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[25] p. xii, *2009 New South Wales Coal Industry Profile*, NSW Department of Primary Industries, August 2009.

[26] The total of 62 includes mines identified by NSWMC, but excludes mines that do not access the Hunter Valley Rail Network.

Appendix C shows observed discrepancies between 'marketable reserve' values for all mines or proposed mines identified by MJA (where reserve figures were published) and equivalent figures provided in the Booz Report.[27]

A brief overview summary comparison of the reserve information is presented in Table 5 below.

Table 5: Summary of MJA and Booz marketable reserves

Zone	*No Mines*[1]	*MJA*	*Booz*
Region 1	26	1507	1,363
Region 2	1	1151	1026
Region 3	2	138	344
Total	**30**	**2,796**	**2,733**

Source: MJA review of public domain documents published by publicly listed mining companies and NSWMC response to MJA's query. Booz Report Annexes .

Note 1: Number of mines shown are mines identified by MJA where Booz quoted value of 'marketable reserves'.

The above table shows that Booz has quoted reserve estimates (for which MJA was able to source reliable public domain data) that yield totals lower than figures obtained from reliable public domain sources for Region 1 and 2. In addition, MJA's sources disclosed reserve estimates for nine of the 'extra' 16 mines identified by MJA (and NSWMC) that are not included in the Booz or ARTC lists. These nine mines have 'marketable reserves' totalling 227Mt; and this amount is missing from the Booz estimates.

MJA acknowledges that it does not have reliable 'marketable reserve' data for all of the 62 mines and proposed mines identified from reliable public domain sources (and the NSWMC). However, the comparison of the available data discussed above shows that data used by Booz could underestimate 'marketable reserves' by as much as 33%.[28] Data provided by ARTC in response to MJA's queries appears to underestimate 'marketable reserves' by some 16%.

3.4. Mine production forecasts

Booz estimated average remaining mine lives by dividing marketable coal reserves by mine production forecasts. The Booz Report states that the mine production forecasts were '*obtained from ARTC/HVCCLT sources*'. Documents that ARTC provided to the ACCC in response to MJA's queries on the Booz methodology advise that the relevant mining companies provided the production forecasts, in confidence, to the rail network operator for the purpose of planning rail network capacity.

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27 MJA has adopted the criteria applied in ARTC's response. That is, the 'marketable reserve' values are the total of Proved (Marketable) Reserves and Probable (Marketable) Reserves.

28 Information compiled by MJA shows that the Booz reserve estimate for mines owned by publicly listed companies who are required to publish JORC compliant is underestimated by as much as 33%. Assuming the same order of discrepancy observed by MJA exists for privately-owned mines, the Booz estimates of reserve could be underestimated by 33%. However, the total discrepancy would be lower if Booz and ARTC had included 'marketable reserve' figures for the 16 'additional' mines of prospective mines not included in the Booz and ARTC lists.

3.4.1. Booz Model

MJA has reviewed the Booz spreadsheet model used to estimate average remaining mine lives. This model – the Booz mine life model – was provided to MJA in confidence and incorporates the production forecasts '*obtained from ARTC/HVCCLT sources*'. These forecasts are in the form of time series, typically showing varying annual production quantities for each mine through to 2018 (or 2019 in some cases), and constant production rates through to 2024.

3.4.2. Mining Company Forecasts

The confidentiality assigned to the mine production forecasts makes it difficult to undertake an informed assessment of those forecasts. MJA, therefore, sought assistance from the NSWMC to identify a small number of mine owners who would be willing to provide MJA with information on the production forecasts for mines owned or operated by the companies.

The NSWMC provided details for contacts in three of the major publicly listed mining companies identified in ARTC's *Explanatory Guide.* MJA contacted all three seeking:

- Advice on the total volume of 'marketable reserves' available at June 2008 for one or more of the mines owned or operated by the mining company; preferably with both Proved (marketable) and Probable (marketable) categories quoted separately and with the category or categories for the reserve estimate stated explicitly.
- Advice on the total volume of 'resources' available at June 2008 for one or more of the mines.
- Advice on mine production rates (expressed as 'marketable coal per year' from 2008 through 2024 (or any shorter time period for which information is readily available) for one or more of the mines.
- Any comments that the company cared to offer on the 'robustness' of the forecast production data as a source for estimating the 'average life' of Hunter Valley coal mines.

The request was accompanied by a brief and general outline of the Booz modelling methodology and an explanation of why MJA was seeking responses to the above points. None of the original 'confidential' information from the Booz model was provided to the mining companies and, therefore, MJA did not seek any comments from the companies about this information. Details of the companies and the information provided are contained in Appendix E. All of the information relating to production forecasts provided by the companies, and included in this Appendix, was designated as 'confidential'.

Each of the three companies responded to this request; and all three provided responses to the first two items above in the form of the published Coal Resource and Coal Reserve Statement as at 30 June 2008, which MJA had already accessed from the company Websites.

One advised that the company was unable to provide any additional information beyond this as it is confidential. The other two provided forecasts to 2024 (or a brief explanation of how MJA could construct such forecasts from the information provided); and only one company responded (by telephone) with brief comments on the relationship between the forecasts provided to ARTC and the Booz approach to estimating average mine life.

All three companies expressly stated that the production forecast information provided was to be treated as commercially confidential, but could be provided by MJA to the ACCC.

A comparison between the forecast production in the Booz model and information provided to MJA by mining companies is presented in Appendix E. In total, the two mining companies provided production forecast information for four operating mines and two proposed mines. One of the proposed mines was not included in the Booz list of mines, but this proposed mine was adjacent to a mine currently operated by the same company and the total annual production for the two mines (from 2008 through 2024) was identical to forecasts for the current mine in the Booz model.

The overall volume of forecast production for these 6 mines totalled some 666Mt to 2024 (or 16.7% of the cumulative total production for all mines in the Booz model). The Booz data for these mines differed significantly year on year with total annual figures varying between -17.5% in 2009 and +8.2% in 2024. However, the difference in overall volume of production forecast to 2024 was just 0.5%, with the Booz total being 3.4Mt lower than the mining company totals.

As noted above, only one of the mining company contacts made comment on the 'robustness' of the forecast production data as a source for estimating the 'average life' of mines. The advice to MJA was that information provided to ARTC was intended to indicate the likely transport volumes for the purposes of addressing 'constraints' in the coal transport chain. This information was provided on the basis that it did not imply any commitment on either party.

None of the mining companies offered any comment on the relationship of production forecasts (provided to either ARTC or MJA) for individual mines and aggregated forecasts of export volumes from Newcastle prepared by independent entities such as ABARE (see discussion below).

3.4.3. Power Station Coal Supplies

Neither the Booz Report nor documents prepared by ARTC make any reference to coal supplied to power stations. MJA's analysis of existing and proposed mines presented in section 3.2 above concluded that Booz had excluded most of the mines that provide coal solely to power stations. However, the mine production forecasts adopted by Booz include coal production for both domestic use and export, because a number of mines service both groups of customers. Information provided by the NSWMC also indicated that some coal from these mines is transported to some power stations without accessing the Hunter Valley Rail Network; and ARTC's response to MJA's queries included information on coal volumes transported on ARTC assets to power stations.

It is MJA's view that the Booz methodology should separately account for domestic power station coal.

Data published by the National Electricity Market Management Company (NEMMCO) in 2007 includes estimates of coal supplied to New South Wales power stations, and lists the mines supplying that coal. The data pertaining to the Hunter Valley and Newcastle power stations are summarised in Table 6 below. These data indicate that approximately 22 Mt/y of coal produced by mines in the Hunter Valley and south of Newcastle was supplied to power stations in 2005/06 – including mines listed by Booz.

Table 6: Black coal fired power stations in New South Wales

Generation	*Power*	*Location*	*Coal Supplied*	*Supplying mines*

portfolio	*station*		*2005-06 (Mt)*	
Macquarie Generation	Bayswater Liddell	Hunter Valley Hunter Valley	7.98 5.14	Mt Arthur Ops, Hunter Valley Ops, Bengalla,Drayton, Beltana/Bulga, Ravensworth/Narama, Duralie, Muswellbrook, Liddell, Mt Owen, Mt Thorley, Warkworth, Donaldson, Whitehaven, Werris Creek
Eraring Energy	Eraring	Newcastle	5.76	Awaba, Fassifern Auger, Mandalong, Myuna, Newstan, Ulan
Delta Electricity	Munmorah Vales Point	Newcastle Newcastle	0.67 2.50	Mannering, Chain Valley, Newstan, Mandalong, West, Wallsend, Westside
National Power	Redbank	Singleton	0.56	Mount Thorley/Warkworth (includes supply of coal washery fines).
Total			22.05	(Excludes Redbank)

Source: Fuel resource, new entry and generation costs in the NEM, Report 2 – Data and Documentation, ACIL Tasman, 6 June 2007, Table 4, page 23.

The NSWMC also identified mines supplying coal to power stations in response to MJA's queries. MJA also reviewed information in the Power Station section of the *2009 NSW Coal Industry Profile* and cross-checked that information with details provided (in the *Coal Industry Profile*) for each of mines identified in Table 6 and the mines identified by NSWMC. A summary of this comparison is presented in Table 7 below.

While there are some differences between the sources identified in Table 7, there is sufficient commonality to conclude that the Booz model should have included consideration of power station coal supply.

Table 7: Coal Supply to NSW Power Stations

Region	Mine[1]	NSWMC Data			Power Stations Supplied	
		Export Coal on HVAU assets	Power Station Coal Supplied	Transport method	ACIL Tasman/NEMMCO (2006-07)	2009 NSW Coal Industry Profile
1	***Awaba***	Yes	Yes	Road	Eraring	Eraring
	Beltana/Bulga	Yes	No		Bayswater, Liddell	No
	Chain Valley	**No**	Yes	Road	Munmorah, Vales Point	Vales Point
	Donaldson	Yes	No		Bayswater, Liddell	No
	Drayton	Yes	Yes	Conveyor	Bayswater, Liddell	Bayswater, Liddell
	Duralie - Gloucester Basin	Yes	No		Bayswater, Liddell	No detail
	Hunter Valley Operations	Yes	Yes	Conveyor	Bayswater, Liddell	Bayswater
	Liddell	Yes	No		Bayswater, Liddell	No
	Mandalong	**No**	Yes	Conveyor	Eraring, Munmorah, Vales Point	Eraring, Munmorah, Vales Point
	Mannering	**No**	Yes	Conveyor	Munmorah, Vales Point	Vales Point
	Mount Arthur	Yes	Yes	Conveyor	Bayswater, Liddell	Bayswater, Liddell
	Mt Owen	Yes	Yes	Conveyor	Bayswater, Liddell	Bayswater, Liddell
	Mt Thorley (& Warkworth)	Yes	No		Bayswater, Liddell, Redbank	Eraring
	Muswellbrook	Yes	Yes	Conveyor/ Road	Bayswater, Liddell	Vales Point
	Myuna	**No**	Yes	Conveyor	Eraring	Eraring
	Newstan	Yes	Yes	Road	Eraring, Munmorah, Vales Point	Eraring, Munmorah, Vales Point
	Ravensworth West & Narama	**No**	Yes	Conveyor	Bayswater, Liddell	Bayswater, Liddell
	United	Yes	Yes	HVAU Rail	No	No
	West Wallsend	**No**	Yes	Road	Munmorah, Vales Point	Vales Point
	Westside	**No**	Yes	Private Road	Munmorah, Vales Point	Eraring
2	**Bengalla**	Yes	Yes	HVAU Rail	Bayswater, Liddell	Eraring
	Ulan *(O/C & U/G)*	Yes	Yes	HVAU Rail	Eraring	Eraring
	Wilpingjong	Yes	Yes	HVAU Rail	No	Bayswater, Liddell
3	**Canyon *(was Whitehaven)***	Yes	No		Bayswater, Liddell	No
	Werris Creek	Yes	No		Bayswater, Liddell	Various

Source:

- *NSW Minerals Council response to MJA queries.*
- *Fuel resource, new entry and generation costs in the NEM, Report 2 – Data and Documentation, ACIL Tasman, 6 June 2007, Table 4, page 23.*
- *2009 New South Wales Coal Profile, NSW Department of Primary Industries, August 2009, pp. 151-158 (and individual Mine listings).*

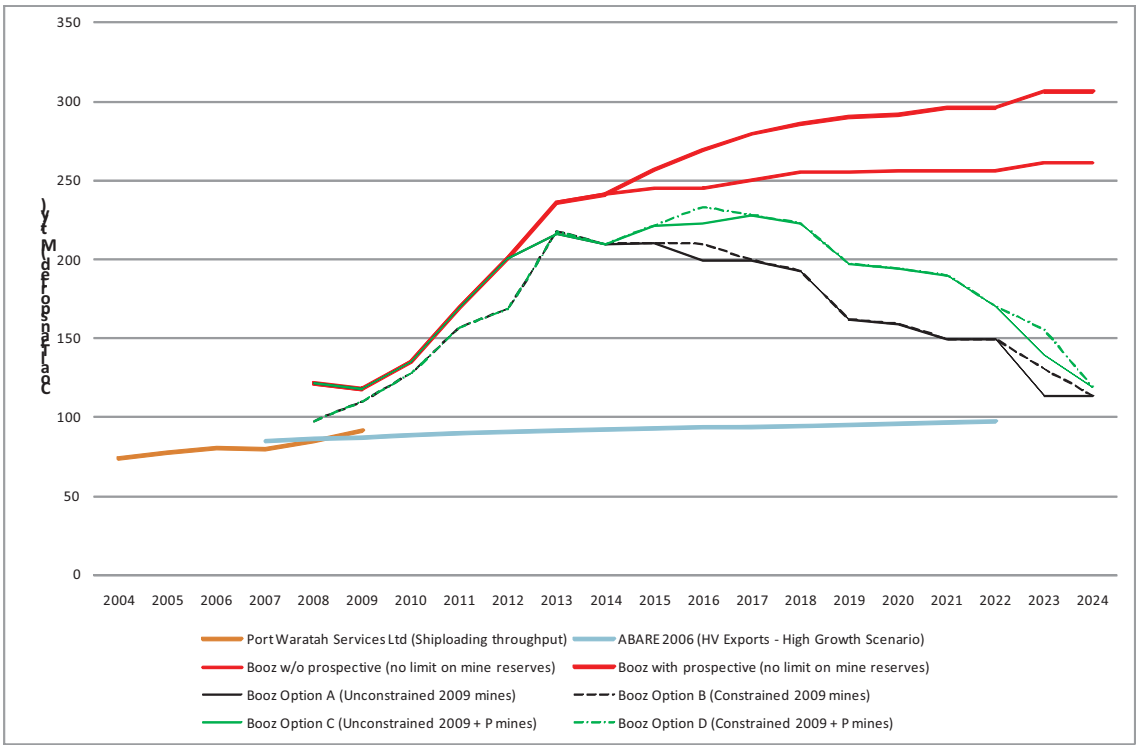
Notes:

1. *Italicised Mine name information is additional to information contained in Booz/ARTC sources. See Appendix C for details.*

3.4.4. ABARE Forecasts

MJA has also sought to test the reasonableness of the mine production forecasts used in the Booz mine life model by comparing the total production forecasts in the model with ship loading data published by Port Waratah Coal Services Ltd,[29] and with forecasts of coal exports for the period from 2007 through 2022 published by ABARE (in 2006). [30] This comparison is illustrated in Figure 2 below, with the orange line representing ship loading volumes, the blue-grey line representing the ABARE forecasts and the various Booz forecasts of total production from all mines represented by the red, green and black lines.

Figure 2: Comparison of coal transported, coal exports and production forecasts



The two red lines at the top of Figure 2 represent the total production forecasts from the Booz mine life model for mines existing in 2008 (thin red line) and existing mines plus proposed mine developments (thick red line), without taking account of any possible transport constraints or limitations in marketable reserves. The red lines are the 'starting point' for the Booz calculations of average mine lives.

29 p. 10, *Annual Report 2008*, Port Waratah Coal Services Limited. Information contained in ARTC's response to MJA's queries included summary data on coal transported by rail to the Port of Newcastle. These figures were generally consistent with the ship loading volumes reported by Port Waratah Coal Services Ltd.

30 *Australian coal exports - outlook to 2025 and the role of infrastructure*, abare research report 06.15, Australian Bureau of Agricultural and Resource Economics, October 2006.

Note that in its publication *Australian commodities*, March Quarter 09.1, ABARE estimates that total Australian thermal coal exports from all ports will not reach 163.5 Mt until 2014. The Booz model implies exports from Newcastle alone would reach this figure as early as 2011.

The black and green lines represent the total production forecast of the four Options described in the Booz Report (that assume the life of each mine ends when 'marketable reserves' at June 2008 are exhausted):

- Option A: unconstrained production all mines in operation 2009 – 2014 (solid black line);
- Option B: constrained production all mines in operation 2009 – 2014 (dashed black line);
- Option C: unconstrained production all mines including "proposed mines" (solid green line); and
- Option D: constrained production all mines including "proposed mines" (dashed green line).

All of the Booz forecasts are higher than the reported ship loading volumes reported by Port Waratah Coal Services in (fiscal year) 2008; and all increase substantially above the ABARE forecast exports from the Port of Newcastle. The minimum difference between the Booz forecasts and ship loading through put in 2008 is similar to the quantity of coal supplied by rail to domestic power stations (and as noted earlier in this report, most of the mines supplying all their coal to power stations are excluded from the Booz analysis). In addition, the production forecasts of the Booz mine life model are substantially higher than the ABARE forecasts of coal exports from Newcastle after 2009, at or exceeding 100% of the ABARE export volume forecasts from 2014 through 2018.

Apart from the 'sample' of information on production forecasts provided directly to MJA by mining companies, MJA has not been able to review the way in which the (confidential) production forecasts used in the Booz mine life model were prepared. MJA is, therefore, unable to drawn firm conclusions on whether the coal production forecasts adopted by Booz are consistent with the basis used for the ABARE forecasts. However, the feedback from the one mining company that responded to MJA's query on this issue suggested that each company forecasts (independently of others) a 'non-binding' target for coal haulage (for the purposes of ensuring adequate coal transport an ship-loading capacity is provided). If the same approach is adopted by all mining companies, this would lead to the total of the production forecasts far exceeding the total demand estimated by ABARE taking account of actual market conditions.

3.5. Capacity constraints in the coal supply chain

For each year in the period 2008 to 2012, the total of the mine production forecasts included in the Booz mine life model exceeds the coal supply chain capacity which has been assumed for that year. For the period beyond 2012, Booz assumes that the providers of the infrastructure which comprises the Hunter Valley coal supply chain will expand their facilities, as required, to meet future demand so that the supply chain is not capacity constrained.

The way in which Booz has established the coal supply chain capacities for the period 2008 to 2012, and whether there is a reasonable basis for expecting capacity expansion in the future, are not clearly explained in the Booz Report.

Given concerns about the robustness of the mine production forecasts (noted in the previous section of this report), MJA has not undertaken further investigation into the reasonableness of the assumption that coal supply chain capacity will be expanded to meet future demand after 2012.

3.6. Averaging the remaining mine lives

ARTC's proposed depreciation policy states that the useful life of a segment of the Hunter Valley Rail Network is to be determined having regard to the average remaining lives of Hunter Valley coal mines utilising the pricing zone of which the segment forms a part.

Average remaining lives of the coal mines using Hunter Valley Rail Network were calculated for ARTC using the Booz mine life model. For each mine and proposed mine development listed in the Booz mine life model:

- cumulative forecast production is calculated for the period 2008 to 2024 as the simple sum of annual production for that period;
- the 'mine life remaining after 2024' is calculated as the difference between the initial marketable reserves and cumulative forecast production, divided by the forecast of production for 2024;
- the year at which the mine is expected to cease production – the 'expected end year' – is then calculated as the sum of 2024 and the 'mine life remaining after 2024';
- the number of years (after 2007) the mine will continue to operate is calculated as the difference between 2008 and the 'expected end year'.
- the 'weighted mine life' is then calculated for each individual mine or proposed development as the product of the 2008 marketable reserves and the number of years the mine will continue to operate; and
- finally, an 'average weighted mine life' is calculated for each 'Region' as the sum of the 'weighted mine lives' divided by the sum of marketable reserves.

These relatively simple calculations are made for four sets of assumptions pertaining to proposed mine development and the effects of capacity constraints in the coal supply chain. The four sets of assumptions are labelled Option A, Option B, Option C and Option D. The options are summarised in the Booz Report as:

- Option A: unconstrained production all mines in operation 2009 – 2014;
- Option B: constrained production all mines in operation 2009 – 2014;
- Option C: unconstrained production all mines including "proposed mines"; and
- Option D: constrained production all mines including "proposed mines".

The impact of capacity constraints, which are assumed to apply only for the period from 2008 to 2012, is taken into account in Options B and D by multiplying the forecast production for each mine in each year by a 'scaling factor' for the year. For each year, this scaling is the ratio of the constrained coal chain capacity for the year (assumed by Booz) to the sum of the 'unconstrained' production forecast for all mines for that year.

MJA is of the view that, if the capacity of the coal supply chain is constrained in a way which would limit mine production, then the capacity constraint should be taken into account in the determination of the average remaining mine lives to be used in the calculation of depreciation for the Hunter Valley Rail Network. Setting aside MJA's concerns about the mine production forecasts, the scaling which Booz has applied to allow for supply chain constraints for the period from 2008 to 2012 is reasonable in the circumstances.

MJA also has concerns about the appropriateness of weighting the estimated life of each of the mines in each segment by the contribution of the mine to total marketable reserves. Mines with high reserves and high productions rates, and relatively short lives, will dominate the average weighted life. Mines with lower reserves, and lower production rates, but relatively long lives, will then require the services of the Hunter Valley Rail Network beyond the period for capital recovery set by the average weighted life.

The effect is illustrated in the example shown in Table 8 below.

Table 8: Illustration of Average mine life

Mine	Reserves (Mt)	Production (Mt)				
		Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
1	100	50	50	-	-	-
2	25	5	5	5	5	5

In the example, Mine 1 has a life of 2 years, and Mine 2 has a life of five years. The reserves-weighted average life is, then:

2 years x 100 Mt/125Mt + 5 years x 25 Mt/125 Mt = 2.6 years

Capital recovery, via straight line depreciation, would be effected over 2.6 years; but Mine 2 will continue to operate, and to require rail network services, for a further 2.4 years.

3.7. Issues not dealt with in the Booz Report

If depreciation for the Hunter Valley Rail Network is to be calculated using the straight line method, with average remaining mine life as a proxy for the remaining life of rail assets, a number of questions arise which have not been properly addressed, or which have not been addressed at all, in the Booz methodology. These questions are:

- Does the methodology identify all operating mines and proposed mines that do, or would reasonably be expected to, access the Hunter Valley Rail Network during the remaining economic life of the HVAU rail assets?
- Are the available marketable reserves data sufficiently robust to provide a reasonable measure of average mine life?
- Should the calculation of depreciation take into account non-coal traffic volumes?
- Should the calculation of average mine life be for Pricing Zones when ARTC's depreciation policy applies to the rail network segments within each pricing zone?
- Does the methodology adequately deal with coal supplies that do not require access to the Hunter Valley Rail Network, or which are delivered to power stations via the HVAU rail assets?
- Is there a way in which ARTC can demonstrate that the production forecasts it has used are consistent with reliable public domain information?

As indicated in the earlier sections of this report, MJA is concerned about the robustness of data available to ARTC if it persists with the Booz methodology. MJA is also of the view that, if ARTC is to rely on confidential mine production forecasts, it should provide validation of those forecasts – at least in aggregate – by correlating total coal haul tonnages with reliable and independent estimates of total coal exports and total coal delivered to power stations.

Whether the calculation of depreciation should take into account non-coal traffic volumes is considered further in the next section of this report.

3.8. Coal as a proportion of total traffic

The Booz methodology assumes that only the volume of coal traffic is relevant to estimating the average remaining lives of the assets which comprises the Hunter Valley Rail Network. It is not immediately obvious to MJA that this is a valid assumption. If it is not valid, then users may pay prices for access to the network that are higher than might otherwise be the case.

In response to a query from MJA, ARTC provided historical data on gross tonne kilometres (**GTK**) hauled on the Hunter Valley Rail Network which are shown in Table 9 below.[31] On providing the data, ARTC noted that it '*shows coal volumes on the Hunter Valley* (sic) *have increased substantially since 1999/2000, whilst non-coal volumes have remained reasonably steady, probably varying with seasonal grain fluctuations*', and that '*planned development of port and track capacity over the next five years is likely to see this trend towards increasing coal dominance on the Hunter Valley coal network continue*'.

Table 9: Hunter Valley Rail Network – gross tonne kilometres hauled

	Coal GTK	*Non-coal GTK*	*% Coal*
1999/2000	11.6	2.1	85%
2000/2001	13.0	2.2	86%
2001/2002	13.7	2.2	86%
2002/2003	13.5	2.0	87%
2003/2004 (Unavailable)	-	-	
2004/2005	15.0	1.1	93%
2005/2006	15.8	2.8	85%
2006/2007	15.8	2.0	89%
2007/2008	19.0	1.8	91%

Notes:

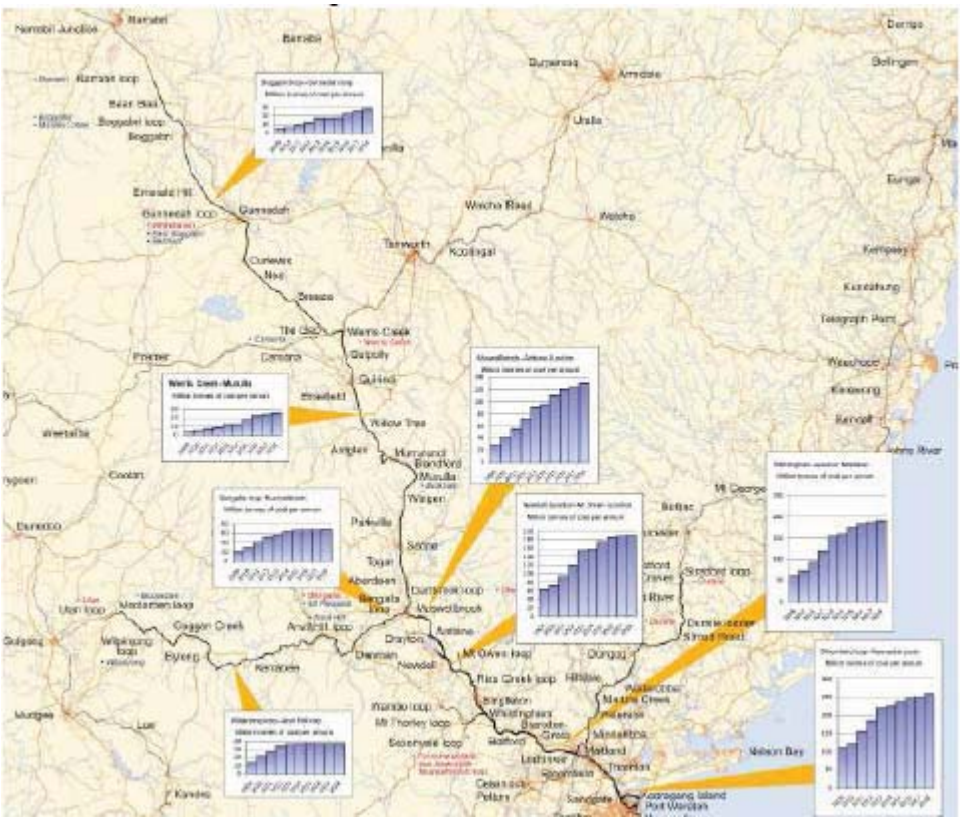
1. *ARTC commenced its lease of parts of the New South Wales rail network, including the Hunter Valley Rail Network, in September 2005*
2. *GTK available for only 10 months of 2004-05. Figures are annualised.*

Certainly, the data provided by ARTC shows coal haulage has increased from 85% of total GTK in 1999/2000 to 91% in 2007/08. However, Table 9 does not show the whole picture. It does not show the distribution of coal and non-coal traffic across the segments of the Hunter Valley

[31] *Australian Rail Track Corporation Ltd Hunter valley access undertaking. ARTC response to ACCC request for information in relation to ARTC's proposed Hunter Valley remaining mine life assessment (confidential)*, ARTC, under cover of to ACCC dated 6 July 2009, Table 1, page 3.

Rail Network. Figure 3 below, which is reproduced from ARTC's *Explanatory Guide*, shows tonnage concentrating downstream from Muswellbrook towards Newcastle. As far as MJA is aware, grain shipments originate from areas near the extremes of the Hunter Valley Rail Network, and from areas beyond the boundaries of the network, so that non-coal traffic is certain to be a higher proportion of the total traffic in Pricing Zones 2 and 3 (beyond Muswellbrook) than for Pricing Zone 1 or the average for the system as a whole. MJA is of the view that the volume of this non-coal traffic is likely to be sufficiently large for it to impact on the average remaining lives of the rail assets in Pricing Zones 2 and 3.

Figure 3: Distribution of coal haulage volumes (forecast)



Source: ARTC Explanatory Guide, Figure 2, page 13.

Furthermore, not all of the coal produced by Hunter Valley mines for domestic use is transported via the Hunter Valley Rail Network. Some of the coal is transported by conveyer or road to power stations and to train loading stations. In its 6 July 2009 response to a request from the ACCC for further information, ARTC provided the data on export and domestic coal haulage volumes which are presented in Table 10 below.[32] These data, and the power station coal consumption data shown in Table 6 above, imply that Hunter Valley mines produce at least

[32] Source: *Australian Rail Track Corporation Ltd Hunter valley access undertaking. ARTC response to ACCC request for information in relation to ARTC's proposed Hunter Valley remaining mine life assessment (confidential)*, ARTC, under cover of to ACCC dated 6 July 2009, Table 1, page 3.

16 Mt/y of coal which is not transported via the Hunter Valley Rail Network.[33] If this is the case, coal may be a smaller proportion of the total traffic on some network segments than is indicated by the production forecasts used in the Booz mine life model.

Table 10: Export and domestic coal transported on the Hunter Valley Rail Network

	Net tonnes (million)			
	2004-05 *(annualised)*	***2005-06***	***2006-07***	***2007-08***
Export coal	69.93	79.76	80.4	88.27
Domestic coal	*4.79*	*4.7*	*6.57*	*6.6*
Domestic coal as percentage of total	*6.4%*	*5.6%*	*7.6%*	*7.0%*

Source: ARTC, 6 July 2009, MJA Analysis

Note: ARTC provided information on coal supplied to four power station supply points, only three of which are located in the areas adjacent to the Hunter Valley Rail Network, and indicated the information was confidential. MJA has aggregated the ARTC data to avoid disclosure of confidential information.

While far from definitive, the data presented in this section of the report suggests that ARTC could improve the implementation of its depreciation policy by amending the Booz methodology to take account of the volumes of grain and other commodities transported over segments of the Hunter Valley Rail Network; and to take into account a higher proportion of these other commodities than is indicated by the mine production forecasts used in the Booz mine life model.

[33] MJA notes that data contained in the 2007 report to NEMMCO from which Table 6 above was sourced were for 2006/07. The maximum potential demand of existing power stations is likely to be around 25 Mt/y.

4. Marsden Jacob Associates' findings

The main findings from MJA's review of ARTC's proposed depreciation policy, and the Booz mine life methodology on which the policy's implementation is based, are set out below.

On ARTC's proposed depreciation policy, MJA has found:

- ARTC's proposed use of the straight line method for the determination of depreciation is consistent with the practice adopted in the setting of regulated prices for access to infrastructure services in Australia;
- ARTC's proposed depreciation of rail assets over the estimated useful lives of assets is also consistent with regulatory practice;
- use of average mine life as a proxy for the remaining life of assets which comprise the Hunter Valley Rail Network is reasonable, but the estimates of future mine production and reserves available for mining, which are used to estimate average mine lives, are uncertain; and
- ARTC's proposed policy applies depreciation to rail segments, whereas the Booz methodology determines average remaining mine lives for pricing zones, which are aggregates of rail segments.

MJA's findings on the Booz methodology and its implementation are:

- Booz has not accounted for at least 16 currently operating mines or proposed mines that do, or would, access the Hunter Valley Rail Network;
- Booz did not access the latest available data on marketable reserves when updating its estimates of average mine life;
- coal production and reserves data for only 27 of the 46 mines and proposed mine developments used by Booz have been prepared in accordance with the JORC Code;
- of these 27 mines and proposed mine developments for which the data have been prepared in accordance with the JORC Code, the marketable reserves data for 13 have been adjusted, by Booz, to 2008 levels, but the basis of this adjustment has not been disclosed;
- Booz has not established the consistency of production and reserves data it has obtained for the remaining 19 mines and proposed mine developments with the data for the 27 mines and proposed mine developments which have been prepared in accordance with the JORC Code;
- no information is provided in the Booz Report on the way in which Booz has converted the potential resources of proposed mine developments to marketable reserves;
- in response to questions from MJA, ARTC:
  - confirmed that where the data were available, Booz used the total of the JORC classifications *Proved (marketable) reserves* and *Probable (marketable) reserves* to establish marketable coal reserves (although the date at which that reserve data was published was not the latest available when the Booz report was finalised and published in February 2009);

  - advised that marketable coal reserves data for prior years were adjusted to 2008 levels by deducting annual production for each of the intervening years, but did not indicate whether Booz used actual production figures or estimates to make the adjustments; and
  - advised that Booz sometimes used estimates of '*conversion factors based on experience in the region*' to convert total coal resource figures to estimates of marketable' reserves, but did not disclose the conversion factors in each case and, in some cases, indicated that resource data were too speculative to allow reliable estimates to be made.

- MJA's comparisons of marketable reserves data used by Booz with information published by the publicly listed mining companies reveals significant discrepancies; in each case a part of the difference can be explained by production during the period between the dates at which the data were compiled, but the magnitudes of the differences cannot be explained by production differences alone;
- mine production forecasts are critical to the determination of average remaining mine lives, but the confidential nature of this data makes informed assessment of those forecasts difficult; and Booz has not provided any independent and publicly available evidence which can assist validation of estimates it has made from confidential data;
- MJA has compared the total of the Booz mine production forecasts with forecasts of coal exports published by ABARE; and concluded that the Booz production forecasts substantially exceed forecast exports leading to doubt about the validity of Booz forecasts;
- coal supplied to power stations has not been accounted for in the Booz mine production forecasts; which has the potential to impart a downward bias to remaining mine lives;
- when the estimated life of each of the mines in each segment is weighted by the contribution of the mine to total marketable reserves, mines with high reserves, high productions rates and relatively short lives will dominate the average weighted life; mines with lower reserves, lower production rates and relatively long lives will then require the services of the Hunter Valley Rail Network beyond the period for capital recovery set by the average weighted life; and
- linking the remaining life of rail assets to average mine life for those segments of the Hunter Valley Rail Network for which coal represents the overwhelming proportion of gross tonnage hauled is reasonable; however, the case for using average mine life when significant gross tonnages of other goods are hauled over rail segments also used for coal transport is not made in the Booz Report.

On the basis of these findings, MJA has concluded that the Booz calculations of average mine life do not provide reasonable estimates of the remaining life of rail assets for the purpose of implementing ARTC's proposed depreciation policy.

Appendix A: Terms of reference for the review

On 12 May 2009, the ACCC sought expressions of interest in a consultancy to review ARTC's proposed depreciation and associated remaining mine life estimates for the Hunter Valley rail network.

The consultant was required to examine the reasonableness of the depreciation and mine life estimates, and of the assumptions proposed by ARTC for its Hunter Valley rail network, based on a report prepared by Booz & Company. In particular, the consultant was to examine:

- whether ARTC's proposed depreciation method specified in clause 4.6 of the Access Undertaking is appropriate and consistent with commercial practice;
- whether the information ARTC has had regard to in determining the useful life of the assets comprising the Hunter Valley rail network is sufficient;
- whether the average remaining mine lives, average mine production rates, and marketable coal reserves adopted by Booz are reasonable and appropriate;
- whether the estimates of remaining mine lives are reasonable and appropriate, having particular regard to:
  - the adopted assumptions;
  - the methodology; and
  - the variables considered;
- whether the four different options provided by Booz are reasonable; and
- whether Option B represents the most appropriate estimate of remaining life for ARTC's Hunter Valley rail network.

As part of its work, the consultant was to develop an information request detailing the information which would be required from ARTC for completion of the consultancy tasks.

On completion of its investigations, the consultant was to provide the ACCC with a draft report setting out detailed reasoning and explanation to substantiate its findings in respect of each of the consultancy tasks. After review of the draft report by ACCC staff, the consultant was to finalise its assessment in a final report, which was to be provided in both electronic and hardcopy formats. Two versions of the final report were required. One would include confidential information supplied by ARTC, and would be used only within the ACCC. Another version of the final report would have the confidential information removed, so that it could be made available to the public via the ACCC's web site.

Appendix B: Relevant commercial practice

Advice was sought, by the ACCC, on whether the ARTC's proposed depreciation method was consistent with commercial practice. To provide this advice, MJA examined the depreciation methods of seven major mining companies as reported in their recent financial statements. The companies were:

- Xstrata;
- BHP Billiton;
- Coal & Allied Industries;
- Rio Tinto;
- Centennial Coal;
- Gloucester Coal; and
- Anglo American.

Extracts from of the notes to the financial statements of these seven companies are presented below.

Each of the companies uses a number of depreciation methods, and all seven depreciate mining properties using the units-of-production method.

In applying the units-of production method, the total production expected from a property is assessed from its mineral reserves. However, there may be variations in the way in which mineral reserves are assessed. Xstrata notes that it uses estimates of economically recoverable reserves. Although these estimates are prepared by appropriately qualified persons, Xstrata advises that they are impacted by forecast commodity prices, exchange rates, production costs and recoveries, and other factors. BHP Billiton calculates depreciation from total reserves determined in accordance with the Australian Code for Reporting of Mineral Resources and Ore Reserves (the "JORC Code"). Reserves and mineral resources determined in accordance with the JORC Code" are used by Coal & Allied, and by Rio Tinto, in the calculation of depreciation. However, Rio Tinto notes that "*in applying the units of production method, depreciation is normally calculated using the quantity of material extracted from the mine in the period as a percentage of the total quantity of material to be extracted in current and future periods based on proved and probable reserves and, for some mines, other mineral resources*". Gloucester Coal uses economically recoverable reserves in applying the units-of-production method, while Anglo American uses proven and probable reserves.

Xstrata (Annual Report 2008)

Reserves (page 26)

Mine reserves decline as commodities are extracted and not all reserves may be mined as profitably as anticipated. Successful exploration and development activities and acquiring properties containing economically recoverable reserves are necessary for Xstrata's future success. In order to develop reserves, various governmental permits must be obtained.

We annually update our proven and probable reserve estimates as to both quantity and quality periodically to reflect the extraction of commodities and new drilling or other data received, available from our website. We maintain a transparent and open relationship with regulators and local, regional and national government bodies and closely monitor compliance with legislation and with the leading practice standards set out by the Group's Sustainable Development Framework.

Estimated recoverable reserves and resources (page 117)

Estimated recoverable reserves and resources are used to determine the depreciation of mine production assets, in accounting for deferred stripping costs and in performing impairment testing. Estimates are prepared by appropriately qualified persons, but will be impacted by forecast commodity prices, exchange rates, production costs and recoveries amongst other factors. Changes in assumptions will impact the carrying value of assets and depreciation and impairment charges recorded in the income statement.

Property, plant and equipment - Land and Buildings, Plant and Equipment (page 120)

Mine production assets are depreciated using a unit of production method based on estimated economically recoverable reserves, which results in a depreciation charge proportional to the depletion of reserves. Buildings, plant and equipment unrelated to production are depreciated using the straight-line method based on estimated useful lives.

Where parts of an asset have different useful lives, depreciation is calculated on each separate part. Each asset or part's estimated useful life has due regard to both its own physical life limitations and the present assessment of economically recoverable reserves of the mine property at which the item is located, and to possible future variations in those assessments. Estimates of remaining useful lives and residual values are reviewed annually. Changes in estimates are accounted for prospectively.

BHP Billiton (from Annual Report 2008)

Mineral Resources and Ore Reserves (page 65)

The statement of Mineral Resources and Ore Reserves presented in this Report has been produced in accordance with the Australasian Code for Reporting of Mineral Resources and Ore Reserves, December 2004 (the JORC Code).

Mine life is calculated as Total Reserve divided by the current approved nominal production rate.

Depreciation of property, plant and equipment (page 174)

The carrying amounts of property, plant and equipment (including initial and any subsequent capital expenditure) are depreciated to their estimated residual value over the estimated useful lives of the specific assets concerned, or the estimated life of the associated mine or mineral lease, if shorter. Estimates of residual values and useful lives are reassessed annually and any change in estimate is taken into account in the determination of remaining depreciation charges. Depreciation commences on the date of commissioning. The major categories of property, plant and equipment are depreciated on a unit of production and/or straight-line basis using estimated lives indicated below, except that where assets are dedicated to a mine or petroleum lease the below useful lives are subject to the lesser of the asset category's useful life and the life of the mine or lease, unless the assets are readily transferable to another productive mine or lease:

- buildings – 25 to 50 years;
- land – not depreciated;
- plant and equipment – 3 to 30 years straight-line;
- mineral rights – based on reserves on a unit of production basis;
- petroleum interests – based on the proved developed oil and gas reserves on a unit of production basis;
- capitalised exploration, evaluation and development expenditure – based on applicable reserves on a unit of production basis.

Coal & Allied Industries (from Annual Report 2008)

Depreciation and impairment (page 47)

Assets are fully depreciated over their economic lives, or over the remaining life of the mine if shorter. For certain assets, the economic benefits from the asset are consumed in a pattern that is linked to the level of production. In such cases, depreciation is generally charged on a unit-of-production basis. The straight-line method is used for some operations where this provides a suitable alternative because production is not expected to fluctuate significantly from one year to another. Assets for which consumption of economic benefits is linked to passage of time are depreciated on a straight-line basis.

Land is not depreciated unless acquired for mining purposes in which case it is included in mining properties. The estimated expected useful lives are as follows:

- Mining properties – remaining marketable reserves utilised on a unit or production basis;
- Machinery and equipment – the shorter of applicable mine life and 5-15 years depending on the nature of the asset; and
- Buildings not being part of mining properties – 40 years.

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at balance sheet date.

Development costs that relate to a discrete section of an ore body and which only provide benefit over the life of those reserves are depreciated over the estimated life of that discrete section.

Determination of ore reserves (page 48)

The Group estimates its ore reserves and mineral resources based on information compiled by Competent Persons (as defined in accordance with Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves of December 2004). Reserves, and, for certain mines' resources, determined in this way are used in the calculation of depreciation, amortisation and impairment changes, the assessment of life of mine stripping ratios and for forecasting the timing of the payment of close down and restoration costs.

Rio Tinto (from Full Financial Statements 2008)

Depreciation of non current assets (page 11)

Property, plant and equipment is depreciated over its useful life, or over the remaining life of the mine if shorter. The major categories of property, plant and equipment are depreciated on a units of production and/or straight-line basis as follows:

Units of production basis

For mining properties and leases and certain mining equipment, the economic benefits from the asset are consumed in a pattern which is linked to the production level. Except as noted below, such assets are depreciated on a units of production basis.

Straight line basis

Assets within operations for which production is not expected to fluctuate significantly from one year to another or which have a physical life shorter than the related mine are depreciated on a straight line basis as follows:

Land and Buildings

Land	Not depreciated
Buildings	5 to 50 years

Plant and equipment

Other plant and equipment	3 to 35 years
Power assets	25 to 100 years
Capital work in progress	Not depreciated

Residual values and useful lives are reviewed, and adjusted if appropriate, at each balance sheet date. Changes to the estimated residual values or useful lives are accounted for prospectively. In applying the units of production method, depreciation is normally calculated using the quantity of material extracted from the mine in the period as a percentage of the total quantity of material to be extracted in current and future periods based on proved and probable reserves and, for some mines, other mineral resources. Such non reserve material may be included in depreciation calculations in limited circumstances and where there is a high degree of confidence in its economic extraction. Development costs that relate to a discrete section of an ore body and which only provide benefit over the life of those reserves, are depreciated over the estimated life of that discrete section. Development costs incurred which benefit the entire ore body are depreciated over the estimated life of the ore body.

Determination of ore reserve estimates (page 12)

The Group estimates its ore reserves and mineral resources based on information compiled by Competent Persons as defined in accordance with the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves of December 2004 (the JORC code). Reserves, and for certain mines, other mineral resources, determined in this way are used in the calculation of depreciation, amortisation and impairment charges, the assessment of life of mine stripping ratios and for forecasting the timing of the payment of close down and restoration costs and clean up costs.

In assessing the life of a mine for accounting purposes, mineral resources are only taken into account where there is a high degree of confidence of economic extraction.

Centennial Coal (from Annual Report 2008)

Property, Plant and Equipment (page 101)

Depreciation is provided on property, plant and equipment, including freehold buildings but excluding land. Depreciation is calculated on either a straight line or units of production basis so as to write off the depreciable amount of each asset over its expected useful life to its

estimated residual value. The estimated useful lives, residual values and depreciation method are reviewed at the end of each annual reporting period.

The following estimated useful lives are used in the calculation of depreciation:

Plant and equipment	5-20 years
Equipment under finance lease	5-15 years

Mining and development properties (page 102)

Mining and development properties include the cost of acquiring and developing mining properties, mineral rights and exploration, evaluation and development expenditure carried forward relating to areas where production has commenced. These assets are amortised using the unit of production basis over the economically recoverable reserves. Amortisation starts from the date when commercial production commences.

Gloucester Coal (from Annual Report 2008)

Property, Plant and Equipment (page 45)

Where parts of an item of property, plant and equipment have different useful lives, they are accounted for as separate items of property, plant and equipment.

Depreciation (page 45)

All assets, including intangibles, have limited useful lives and are depreciated/amortised using the straight line or diminishing value methods over their estimated useful lives, with the exception of freehold land (which is not depreciated), mining property, plant and equipment (which are amortised on a units of production basis over the life of the economically recoverable reserves) on a prospective basis.

The estimated useful lives (including useful life based on current production basis) in the current and comparative periods are as follows:

Freehold buildings	7–12 years
Plant and equipment	7–12 years
Office equipment, furniture and fittings	4–5 years
Motor vehicles	4–5 years
Mining property and development	7–12 years

The residual value, the effective life and the depreciation method applied to an asset are assessed at least annually.

Anglo American (from Annual Report 2008)

Useful economic lives of assets and ore reserves estimates (page 56)

The Group's mining properties, classified within tangible assets, are depreciated over the respective life of the mine using the unit of production (UOP) method based on proven and probable reserves. When determining ore reserves, assumptions that were valid at the time of estimation may change when new information becomes available. Any changes could affect prospective depreciation rates and asset carrying values.

The calculation of the UOP rate of amortisation could be impacted to the extent that actual production in the future is different from current forecast production based on proven and probable mineral reserves.

The majority of other tangible assets are depreciated on a straight line basis over their useful economic lives. Management reviews the appropriateness of assets' useful economic lives at

least annually and any changes could affect prospective depreciation rates and asset carrying values.

Tangible assets (page 89)

Mining properties are depreciated down to their residual values using the unit of production method based on proven and probable reserves. Depreciation is charged on new mining ventures from the date that the mining property is capable of commercial production. When there is little likelihood of a mineral right being exploited, or the value of the exploitable mineral right has diminished below cost, a write down to the recoverable amount is charged to the income statement.

Land and properties in the course of construction are carried at cost, less any recognised impairment. Depreciation commences when the assets are ready for their intended use. Buildings and plant and equipment are depreciated down to their residual values at varying rates, on a straight line basis over their estimated useful lives or the life of mine, whichever is shorter. Estimated useful lives normally vary from up to 20 years for items of plant and equipment to a maximum of 50 years for buildings.

Residual values and estimated useful lives are reviewed at least annually.

Assets held under finance leases are depreciated over the shorter of the lease term and the estimated useful lives of the assets.

Units-of-Production Depreciation Method[34]

Under the Units-of-Production method, useful life of the asset is expressed in terms of the total number of units expected to be produced. Annual depreciation is computed in three steps.

First, **Depreciable Cost** is computed.

Depreciable Cost = Original Cost - Salvage Value.

Second, **Depreciation per Unit** is computed by dividing Depreciable Cost by the Total Units of Production expected from the asset.

Depreciation per Unit = Depreciable Cost/Total Units of Production

Third, Annual Depreciation for a year is computed as the product of Depreciation per Unit and the number of units produced during that year.

Annual Depreciation = Depreciation per Unit * Units produced during the Year.

The Book Value, or written down value, of the asset is then calculated by subtracting Accumulated Annual Depreciation from the Original Cost of the asset.

Book Value = Original Cost - Accumulated Depreciation

Suppose, an asset has **Original Cost $70,000**, **Salvage Value $10,000**, and is expected to produce **6,000 units**.

Depreciable Cost = $70,000-$10,000 = $60,000

Depreciation per Unit = $60,000/6,000 units = $10/unit

The table below is the **Units-of-Production** depreciation schedule of the asset.

Book Value Beginning of Year	*Units of Production*	*Depreciation Cost per Unit*	*Annual Depreciation*	*Accumulated Depreciation*	*Book Value End of Year*
$70,000	1,000	$10	$10,000	$10,000	$60,000
$60,000	1,100	$10	$11,000	$21,000	$49,000
$49,000	1,200	$10	$12,000	$33,000	$37,000
$37,000	1,300	$10	$13,000	$46,000	$24,000
$24,000	1,400	$10	$14,000	**$60,000**	**$10,000**

Depreciation stops when Book Value is equal to the Scrap Value of the asset. At that time, the sum of Accumulated Depreciation and Scrap Value is equal to the Original Cost of the asset.

[34] http://en.wikipedia.org/wiki/Depreciation [accessed 15th June 2009]

Appendix C: Mine data collated by MJA

The data is the following table has been collated from various sources including public domain reports and information published by publicly listed mining companies that own or operate mines in areas serviced by the Hunter Valley Rail Network. Additional information provided by the NSW Minerals Council has also been incorporated into this table.

Notes:

- Mines in **bold black** are as listed in Booz/ARTC analysis. Mine with -P suffix is classified as Prospective (not yet developed) in Booz/ARTC analysis.
- Mine name changes are indicated in **bold red**.
- Mines in **bold brown** are listed in Annual Reports or other company documentation, but are not included in the Booz/ARTC analysis.
- Mines in **bold blue** are those supplied by NSWMC, but are not included in the Booz/ARTC analysis.
- Status of mines in **bold blue** as indicated by NSWMC that differ from status shown in Booz/ARTC analysis.

'?' indicates that Reserve information is not available in the public domain documents reviewed by MJA

Name	Discrepancies BOOZ vs MJA (Mt)	Booz & Co Annex B		MJA Analysis, June 2009					
				Owner	Resource (Mt)	Marketable Reserve (Mt)			Data Source
		Reserve (Mt)	Data Source		OC & UG	Proved	Probable	Date	
Zone 1									
Abel	**?**			Donaldson Coal	?	?	?		
Ashton (O/C & U/G)	**-26.5**	46.2	AME	Felix Resources Ltd	452.0	45.0	27.7		Felix Resources Annual Report 2008, p.15
Austar	**?**	42.2	NSW Coal	Yancoal Australia Pty Ltd	?	?	?		
Awaba East	**-48.3**			Centennial Coal	162.7	**48.3**		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Awaba				Centennial Coal	46.2	**0.0**		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Bloomfield	**?**	22	AME	Bloomfield Group	?	?	?		
Bulga (formerly Saxonvale)	**-83.8**	79.4	AME	Xstrata Coal	1,687.2	**132.7**	**30.5**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;
Beltana (Part of Bulga)	**?**			Xstrata Coal	?	?	?		Xstrata Coal Website & p.77 Xstrata Annual Report 2008;
Blakefield (Part of Bulga)	**?**				?	?	?		
Camberwell	**?**	9.6	AME	Camberwell Coal Joint Venture	?	?	?		
Chain Valley	**?**			Excel Coal Ltd	?	?	?		
Cumnock No 1	**-163.5**	1	AME	Xstrata Coal	458.3	**1.1**	**163.4**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. Xstrata Coal Website & p.77 Xstrata Annual Report 2008;
Donaldson	**?**	15.7	AME	Donaldson Coal	?	?	?		
Drayton	**22.0**	50.6	NSW Coal	Anglo Coal Australia (ACA)	23.0	**18.5**	**10.1**	31-Dec-08	Anglo American plc Annual Report 2008, p. 152 & 156. http://www.dpi.nsw.gov.au/minerals/resources/coal/new-mines-and-projects
Duralie	**-9.8**	17	AME	Gloucester Coal (through subsidiary Duralie Coal Pty Ltd)	140.6	26.8		31-Dec-08	Gloucester Coal, Resource & Reserves Update 17 Feb 2009
Glendell	**-10.8**	23.5	NSW Coal	Xstrata Coal	191.3	**33.1**	**1.2**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009

Integra O/C & U/G (was Glennies Creek)	?	37.9	NSW Coal	AMCI Australia Pty Ltd (American Metals and Coal International Inc)	?	?	?		
Grant & Chainey	?			Gloucester Coal Ltd	33.0	?	?	31-Dec-08	Gloucester Coal, Resource & Reserves Update 17 Feb 2009
Hunter Valley Operations	-40.2	290	Company Data	Coal & Allied Industries	1,331.0	267.4	62.8	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33
Hunter Valley South	?	300	Company Data	Coal & Allied Industries	?	?	?		
Liddell	6.9	66.7	AME	Xstrata Coal	710.2	44.4	15.4	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008; http://www.muswellbrook.nsw.gov.au/Snapshot/business.html
Mandalong	-102.1			Centennial Coal	348.2	102.1		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Mannering	-10.9			Centennial Coal	257.8	10.9		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Mitchells Flat	?			Xstrata Coal	510.1	?	?	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009
Mount Arthur	60.0	228	Company Data	BHP Billition (through subsidiary Hunter Valley Energy Coal Ltd)	2,816.0	168.0		30-Jun-08	BHP Billition Annual Report 2008, p. 88-91. http://www.muswellbrook.nsw.gov.au/Snapshot/business.html. Note: BHP estimates mine life to be 14 years (see p. 91 annual report)
Mt Arthur Southern Pit	?				?	?	?		
Mt Arthur U/G	?				?	?	?		
Mt Thorley	-4.2	19.6	Company Data	Coal & Allied Industries	113.0	20.6	3.2	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33
Mt Thorley U/G	?				?	?	?		
Mt Owen	158.2	209.9	AME	Xstrata Coal	162.4	36.0	15.7	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;
Muswellbrook	?			Idemitsu	?	?	?		http://www.idemitsu.com/ir/library/pdf/2009_01.pdf
Myuna	-23.1			Centennial Coal	355.3	23.1		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Ravensworth UG (was Newpac no 1)	24.3	56	NSW Coal	Xstrata Coal	275.1	31.5	0.2	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;
Newstan	-18.0	0.4	B&Co Estimate	Centennial Coal	134.1	18.4		30-Jun-08	Centennial Coal Annual Report 2008, p. 26
Ravensworth East (Mt Owen)	-3.8	7.1	NSW Coal	Xstrata Coal	69.7	10.6	0.3	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;
Ravensworth West & Narama	-27.1	13.7	NSW Coal	Xstrata Coal	106.4	15.3	25.5	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;
Rixs Creek	?	35.3	AME	Bloomfield Group	?	?	?		
Saddlers Creek (O/C & U/G) (to be Drayton South)	?	25	NSW Coal	Anglo Coal Australia (ACA)	536.8	?	?	31-Dec-08	Anglo American plc Annual Report 2008, p. 158
Sandy Creek	?			Idemitsu	?	?	?		
Stratford	-11.2			Gloucester Coal Ltd	35.3	11.2		31-Dec-08	Gloucester Coal, Resource & Reserves Update 17 Feb 2009
Tasman	?	22.6	NSW Coal	Donaldson Coal	?	?	?		
Teralba	?	28.6	Company Data	Xstrata Coal	85.7	?	?		Xstrata Ore Reserves & Mineral Resources Jan 2009. p.77 Xstrata Annual Report 2008;

United	**4.5**	8.2	AME	Xstrata Coal	100.4	**3.7**	**0.0**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. Xstrata Coal Website & p.77 Xstrata Annual Report 2008;
Wallarah No. 2	**?**			Wyong Areas Coal Joint Venture	?	?	?		
Wambo (O/C & U/G)	**?**	101.7	AME	Peabody Energy	?	?	?		
Warkworth	**-32.8**	245.3	Company Data	Coal & Allied Industries	603.5	**157.2**	**120.9**	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33
Westside	**-2.9**			Xstrata Coal	3.4	**2.9**		30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. Xstrat Coal Website
West Wallsend	**-28.6**			Xstrata Coal	119.2	**14.4**	**14.2**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. Xstrat Coal Website
Zone 2									
Bengalla	**15**	146.9	Company Data	Coal & Allied Industries	170.1	**69.8**	**62.0**	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33. http://www.muswellbrook.nsw.gov.au/Snapshot/business.html
Bengalla (Wantana)	**?**				?	?	?		
Bylong	**?**				?	?	?		
Mangoola (was Anvil Hill)	**-18**	115.7	Company Data	Xstrata Coal	498.2	**116.6**	**16.8**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009. http://www.dpi.nsw.gov.au/minerals/resources/coal/new-mines-and-projects
Moolarben (O/C & U/G)	**-123**	233.8	AME	Felix Resources Ltd	706.4	84.5	272.3		Felix Resources Annual Report 2008, p.15. http://www.dpi.nsw.gov.au/minerals/resources/coal/new-mines-and-projects
Mount Pleasant		349.9	Company Data	Coal & Allied Industries	698.6	**0.0**	**349.9**	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33. http://www.muswellbrook.nsw.gov.au/Snapshot/business.html
Ulan (O/C & U/G)	**1**	179.7	AME	Xstrata Coal	781.5	**118.7**	**60.2**	30-Jun-08	Xstrata Ore Reserves & Mineral Resources Jan 2009
Ulan West U/G	**?**				?	?	?		
Wilpingjong	**?**	245.9	NSW Coal	Peabody Energy	?	?	?		
Zone 3									
RocGlen (Belmont)	**3**	10.8	AME	Whitehaven Coal	14.2	**7.6**		30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33. http://www.whitehaven.net.au/pages/projects/belmont/index.php
Bickham	**?**	49.7	NSW Coal	Bickham Coal Company Ltd	?	?	?		
Blue Vale	**?**			Whitehaven Coal	5.0	?	?	30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33
Boggabri	**?**	100	Company Data	Idemitsu	?	?	?		http://www.dpi.nsw.gov.au/minerals/resources/coal/new-mines-and-projects; http://www.idemitsu.com/products/resource/coal.html
Caroona - P	**?**	100	B&Co Estimate	BHP Billiton	?	?	?		http://www.bhpbilliton.com/bb/ourBusinesses/energyCoal/caroonaCoalProject.jsp
Dartbrook (O/C Planned)	**?**	43.5	NSW Coal	Anglo Coal Australia (ACA)	222.0	?	?	31-Dec-08	Anglo American plc Annual Report 2008, p. 158 / News Release 4th Aug 2008

Maules Creek - P	**?**	300	B&Co Estimate	Coal & Allied Industries	397.8	?	?	31-Dec-08	Coal & Allied Ltd Annual Report 2008, p. 32,33
Narrabri (North & South)	**197**	300	Company Data	Whitehaven Coal	438.2	**51.1**	**51.6**	30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33. http://www.whitehaven.net.au/pages/projects/narrabri/index.php
Sunnyside	**?**	5	Company Data	Whitehaven Coal	72.2	?	?	30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33. http://www.whitehaven.net.au/pages/projects/sunnyside/index.php
Tarrawonga	**18**	26	Company Data	Whitehaven Coal	145.3	7.7		30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33
Watermark - P	**?**	100	B&Co Estimate	China Shenua Energy Company	1,000.0	?	?		Chine Shenhua Energy Company Annual Report, p. 10
Werris Creek	**-12**	7.6	NSW Coal	Whitehaven Coal	38.0	**17.6**	**2.3**	30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33. http://www.whitehaven.net.au/pages/projects/werris_creek/index.php
Canyon (was Whitehaven)	**?**	1.8	Company Data	Whitehaven Coal	?	?	?	30-Apr-08	Whitehaven Coal Annual Report 2008, p. 32, 33. http://www.whitehaven.net.au/pages/projects/whitehaven/index.php

Appendix D: Information from NSW Minerals Council

D.1 MJA Request

The following request for information was emailed to the NSW Minerals Council.

From: Jeff Washusen
Sent: Saturday, 18 July 2009 2:40 PM
To: an53696@bigpond.net.au
Cc: Gauci, Michael; Wu, Patrick; John Williams; Nadja Wiedemann
Subject: Comment on Booz & Co mine life methodology
Importance: High
Sensitivity: Confidential

Geoff,

Further to our initial telephone discussion of several weeks ago, I provide the attached spreadsheet which contains a summary of information on which Marsden Jacob Associates (MJA) seeks comment by the NSW Minerals Council (NSWMC). The spreadsheet shows a comparison between data contained in the Annexes of the Booz & Co report on mine life prepared for ARTC and public domain data sourced by MJA from documents published by publicly listed companies that own and operate mines in the Hunter Valley.

A list of specific queries on which MJA is seeking NSWMC comments is provided at the end of this email. Note that MJA is not seeking a detailed written response to these queries. A brief email response would suffice where a written response is appropriate. MJA would value any comments that you can make. However, note that MJA has a contractual commitment to complete work for the ACCC by 31 July. It would, therefore, be extremely helpful if NSWMC could provide any input no later than close of business on 27 July to allow consideration of comments to be included in MJA's final report to the ACCC.

For your convenience, I have inserted several columns in the attached spreadsheet where you can insert short comments. The suggested alternative comments are shown above each column. I would appreciate it if you could make the necessary insertions (assuming you have information that enables you to do so) and send the modified spreadsheet back to me with the above email. Please feel free to add additional columns if this is helpful; but I would appreciate it if you left the existing information unchanged.

MJA will also consider any other comments provided by NSWMC that relate specifically to scope of work summarised very briefly below. Any comments not related to MJA's scope of work will be forwarded to the ACCC for consideration.

Also as discussed in our initial conversation, the scope of work for MJA commissioned by the ACCC is to review and comment on the methodology adopted by Booz & Co for estimating 'weighted average mine life'. As you are aware, the Booz & Co estimate of 'weighted average mine life' has been adopted by ARTC as a 'proxy' for remaining rail asset life for the purposes of quantifying depreciation costs recovered in access prices. MJA's scope does not include a requirement to recommend alternative methods for estimating mine life or alternative

methods for defining the remaining life or depreciation life of any of ARTC's assets. If the NSWMC has any particular views on these questions, I recommend that such views be included in a formal submission from the NSWMC to the ACCC.

The methodology described by Booz & Co includes consideration of:

- Estimates of 'marketable' coal reserves for each individual operating or proposed mine in the Hunter Valley that does, or would if developed, transport coal through ARTC's assets.
- Estimates of annual coal production to 2024 (i.e. 16 years from 2008) for each of the mines listed by Booz & Co.
- Estimates of 'constraints' in the coal supply network.
- Application of a 'weighting factor' based on average annual production for each mine.

The 'weighted average mine life' is calculated under four sets of assumptions, with the main variables relating to the inclusion or exclusion of future mine developments and constraints in the coal supply chain.

A very brief background of the relationship between the above aspects of the Booz & Co methodology and the queries listed at the end of this email is presented below. This brief background is intended to assist your understanding of the context of MJA's queries.

Estimates of 'marketable' coal reserves for each individual mine in the Hunter Valley that transports coal through ARTC's assets.

The Booz & Co report attributes the source of the quoted 'marketable reserve' values to AME Mineral Economics, NSW Coal Industry Profile 2006, Public information on mine reserves from (mining) company websites or Booz & Co estimates (for proposed developments), adjusted as Booz & Co deemed appropriate to a 'base date' of 2008.

None of the original source data used by Booz & Co has been provided to MJA.

Neither the Booz & Co report nor other documents prepared by ARTC indicate whether the 'marketable reserves' quantities refer to the Proved Reserve category or the total of Proved and Probable Reserve categories as specified in clauses 29, 30 and 39 of the *Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (The JORC Code)*.

In addition, MJA notes that:

- The reference to transport on ARTC's assets is MJA's assumption because this is not explicitly stated in the Booz & Co report or any other documents originating from ARTC.
- The names and numbers of mines in the Booz & Co listings is different to the list prepared by MJA from public domain financial reports published by the major mining companies operating in the Hunter Valley.
- The numerical value of 'marketable reserves' quoted by Booz & Co differs significantly for the majority of listed mines compared to values for 2008 quoted in financial statements published by publicly listed mining company reviewed by MJA – irrespective of whether the comparison is made with Proved (marketable) Reserve values or the total of Proved (marketable) and Probable (marketable) Reserve values.

Estimates of annual coal production to 2024 for each of the mines listed by Booz & Co.

The Booz & Co report states that the production forecasts were '*obtained from ARTC/HVCCLT sources*'; but does not specify the time period applying to this information. Documents provided to the ACCC by ARTC state that this information was provided to ARTC in confidence by the relevant mining companies for the purposes of planning rail capacity.

MJA has been provided with this data by the ACCC (in the form of the Booz & Co mine life model). The data included in the Booz & Co model typically shows varying annual production quantities for each mine through to 2018 (or 2019 in some cases) then constant production rates through to 2024. This suggests the original forecast data was for a 10 year period 2008-2018, with Booz & Co assuming or estimating production rates after 2018 – although this is not clearly stated in the Booz & Co report.

The ACCC has advised that the production forecast information provided to MJA cannot be disclosed to third parties without specific agreement of ARTC and the relevant mining companies. Accordingly, this part of the Booz & Co input data is not included in the attached spreadsheet.

MJA recognises that the above confidentiality constraint makes it difficult for NSWMC to make any informed comment on the values. In an attempt to overcome this constraint, MJA seeks NSWMC assistance in confirming the relevance and accuracy of the production forecasts through direct approaches to up to 6 of the operating Hunter Valley mines shown in the attached list. MJA will take NSWMC's advice on which mines would be most relevant (and most likely to expeditiously respond to a request for information); but suggest that two large, medium and small mines be selected.

Given that we cannot provide the original data, we would be seeking the same information from each of these mines (i.e. forecast production of 'marketable' coal over the period to 2024 – or the longest available).

In addition, MJA notes that some of the mines listed by Booz & Co provide coal to one or more of the Hunter Valley Power Stations (Bayswater, Eraring, Liddell, Vale Point and Munmorah) which together have the capacity to consume up to 25Mt/y of coal. Information from power company Websites confirms that some of the coal supplied to some power stations comes directly from adjacent (or nearby) mines by overland conveyer; confirming that some coal produced by the relevant mines is not transported on ARTC's assets. However, the Booz & Co report makes no reference to this aspect of the Hunter Valley coal supply arrangements and it is not clear how this coal is treated in the Booz & Co methodology.

Estimates of 'constraints' in the coal supply network.

The way in which supply chain constraints are established and dealt in the Booz model is not clearly explained in the Booz & Co report. However, MJA notes that clarification of this aspect of the report was provided by ARTC in response to the report prepared by LECG for IPART. MJA does not anticipate that NSWMC would need to make any further comments on this aspect of the Booz methodology. However, MJA will consider any specific comments on this aspect that the NSWMC believes are relevant to MJA's scope of work.

Details on which comments are sought from NSWMC.

The areas where MJA is seeking comment from the NSWMC is provided below. These are more-or-less consistent with the request outline sent to NSWMC by the ACCC.

- Confirmation of entries on the attached list that identify operating (or closed) mines in the Hunter Valley.
- Confirmation of entries on the attached list that identify proposed mine developments that could be considered for development over the next 10 year period in the Hunter Valley (or even to 2024).
- Confirmation of entries on the attached list that identify the above mines and proposed developments, if any, that would not require access to ARTC's assets and relevant information (if available) about how coal from these mines is, or would be, transported.
- Suggestions of contacts in a small number of mines who would be prepared to provide estimates of coal resources and reserves and mine production rates, subject of course to confidentiality arrangements.

Further additions to the original list are:

- Identification of all loading points by reference to the nearest mine that connect to ARTC's assets (it is not essential, but it would be of some assistance to MJA's understanding of the Hunter Valley coal transport arrangements if NSWMC could provide a map showing the locations of actual and proposed mines and loading points).
- The NSWMC's views on the reliability of information on mine reserves published by publicly listed mining companies in, or connected with, financial statements where such information is developed in accordance with the procedures specified in the 2004 JORC Code; and
- Identification of mines supplying coal to NSW power stations and an indication (or actual figures) of the proportion of coal transported to these customers by means other than ARTC's assets.

Every effort has been made by MJA to minimise the burden placed on NSWMC. Note that MJA is seeking NSWMC's assistance (if possible) in confirming:

- **which of the listed mines (or proposed developments) are located in the Hunter Valley;**
- **which of the listed mines access ARTC assets;**
- **the location of each individual loading point (by reference to the nearest mine);**
- **which of the listed mines load coal through each individual loading point; and**
- **which of the listed mines supply the Hunter Valley Power Stations, and the proportions of annual output is transported to the mines through assets other than those of ARTC.**

Apart from information on coal supplied to Hunter Valley Power Stations, MJA does not expect or require the NSWMC to provide any quantitative information in response to these queries. In any case, MJA does not expect or require information to be provided unless it is readily and freely available to NSWMC.

In particular, it is noted that MJA does not expect or require NSWMC to confirm the numerical values contained in the spreadsheet. MJA would, however, appreciate comments on whether

it is reasonable for MJA to rely on numerical values that represent Marketable Reserves quoted in financial statements published by publicly listed mining companies. Note that all such values quoted by MJA have been sourced from documents that refer to quantities being determined in accordance with the procedures specified in the 2004 *JORC Code.*

If any information the NSWMC can provide is of a confidential nature, this condition should be clearly stated and MJA will ensure this constraint is conveyed to the ACCC.

Best regards

Jeff Washusen

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D.2 NSW Minerals Council Response

From: Geoff Andrews [mailto:an53696@bigpond.net.au]
Sent: Thursday, 30 July 2009 1:23 PM
To: Jeff Washusen
Subject: Re: Hunter Valley coal supply

Jeff,

Attached are

1. Your table of Mines and Proposed Mines with data added as you requested
2. Comments on the table and data; answers to your questions about opening and closing mines; and data and comments on the increases in recoverable reserves over the same period and the indicated future reserve life.
3. The NSWMC position on Remaining Mine Life extracted from the NSWMC submission to the ACCC, for your information.

I have included three company contacts in our comments document if you wish to contact those companies for further information. I have advised those people that you may make contact and the reason for your contact. They will respond to your queries or direct you to someone who will. I will supply some others shortly.

Apologies for the time taken to get this to you but there have been other calls on our time. I have suggested informally to Michael Gauci that he may like to give you an extension of time for your work because of the time taken for ARTC to provide information and then for us to provide this information.

Please call me if you have any queries.

Regards
Geoff

D.3 Attachment to NSW Minerals Council Email

NSWMC Comments On
MJA Mine Production and Reserves Table

Attached is the MJA table of mines and proposed mines with the data which MJA requested from the NSWMC filled in. We have noted some mine name changes and additional proposed mines in blue.

For clarity and in keeping with your segregation of the mines into the three access pricing zones that ARTC is proposing for RMLs, MJA might find it easier to put all the mines & proposed mines south of Newcastle into a separate group. These are Awaba & Awaba East, Chain Valley, Mandalong, Mannering, Myuna, Newstan, Wallarah No 2, West Wallsend and Westside.

In that group, the mines and proposed mines which rail coal to the port terminals at Newcastle are:

- Awaba & Awaba East
- Mandalong
- Myuna
- Newstan

These four mines use the Rail Corporation of NSW's interurban network to Newcastle and then a small section of Zone 1 of the ARTC network to get into the port terminals.

In relation to coal being railed to power stations on the ARTC network, the mines NSWMC is aware of are United, Bengalla, Ulan and Wilpinjong and our estimate is that, in total, these railings are currently around 5-6 Mtpa. In the Valley itself, all other coal to power stations is moved by conveyor and, south of Newcastle, it is moved by conveyor, road and non ARTC rail.

Contacts with Coal Producers

If you wish to contact 2 large and 2 medium companies to discuss their data, please email the following contacts. NSWMC has advised them of your possible contact.

- Xstrata: Brett Harris bharris@xstratacoal.com.au
- Rio Tinto: Xiao-Fan Zhuang xiaofanzhuang@riotinto.com
- Anglo: Debby Drago Debby.Drago@anglocoal.com.au

Mines Developed in the Last 10 years

Mines using the ARTC network that have come into operation since 1999/2000 are Ashton, Beltana, Donaldson, Duralie, Glendell, Glennies Creek, Mt Arthur, Nardell, Ravensworth U/G, Ravensworth East (Mt Owen), Tasman, Wilpinjong, Roc Glen, Boggabri,

Canyon, Tarrawonga and Werris Creek and mines currently under construction are Blakefield and Moolarben. South of Newcastle, the only mine to have come into operation is Mandalong.

Mines using the ARTC network that have ceased operation since 1999/2000 are Bayswater No 3 (which has become part of the Mt Arthur lease), Camberwell (reserves exhausted), Dartbrook (for operational reasons but it is planned to restart it in the future) and Nardell (under administration). South of Newcastle, mines that have ceased operation are Cooranbong (replaced by Mandalong), Endeavour, Moonee, Munmorah, New Wallsend, Teralba, Wallarah and Wyee but most of these were old mines supplying coal to adjacent power stations.

NSWMC Submission to ACCC on RML

Also attached for your information is an extract from the NSWMC submission to the ACCC in relation to remaining mine life. A supporting document will be available shortly.

Reserve Increases and Their Effect on Remaining Mine Life

In its submission to the ACCC in relation to remaining mine life, the NSWMC argued that new reserves will continue to be defined/proved for both existing mines and proposed mines from the large coal resources in the Sydney and Gunnedah Basins serviced by the ARTC's Hunter Coal Network.

The NSWMC's view is supported by the increase in recoverable coal reserves in the various NSW coalfields over the seven year period between 30 June 1999 (the point at which IPART determined an initial average remaining mine life of 40 years for the Hunter coal rail network under the NSW Rail Access Undertaking) and 30 June 2006 (the last point for which the NSW Department of Primary Industries has published NSW coal reserve data).

The 30th June 1999 data is sourced from in the 2001 Coal Industry Profile published by the then NSW Department of Minerals Resources and the 30th June 2006 data is sourced from in the 2008 Coal Industry Profile published by the NSW Department of Primary Industries.

Table 1 below shows that, over the seven year period, recoverable reserves in the Hunter, Gloucester and Gunnedah coalfields increased by a combined 1,709 Mt (34%) after raw coal production of 692 Mt over the period. In total, recoverable reserves in those coalfields increased by 2,401Mt (47%) over the period.

In the Newcastle and Western coalfields, significant portions of which are also serviced by the ARTC's Hunter Coal Network, a similar trend can be seen.

Table 1
NSW Coal Reserves & Production (MT)

	Recoverable Coal Reserves		Raw Coal Production
Coalfield	**At 30 June 1999**	**At 30 June 2006**	**1999/00 to 2005/06**
Hunter	4260	5101	NA
Gloucester	20	18	NA
Gunnedah	760	1630	NA
Sub-total	**5040**	**6749**	**692**

Newcastle	1790	1822	129
Western	1250	1793	119
Southern	870	761	84
Oatlands	1120	1280	0
Total	**10070**	**12405**	**1024**

Table 2 below shows the "indicated reserve lives" in years for the NSW coalfields at the beginning and end of the same seven year period. The indicated reserve life at 30 June 1999 was determined by dividing the Recoverable Coal Reserves at 30 June 1999 (in Table 1) by the Raw Coal Production in 1999/00 (in Table 2) and the indicated reserve life at 30 June 2006 was similarly determined by dividing the Recoverable Coal Reserves at 30 June 2006 by the Raw Coal Production in 2006/07.

Table 2 shows that, notwithstanding both the substantial quantity of reserves consumed and the substantial increase in the annual production rate over the seven year period, the indicated reserve life increased slightly for the Hunter, Gloucester and Gunnedah coalfields and for the Newcastle coal field. Although the indicated reserve life for the Western coalfield was reduced by a small amount, it remains substantially above that for the Hunter, Gloucester and Gunnedah coalfields and the overall average of the coalfields serviced by the ARTC's Hunter coal network remains essentially unchanged.

Table 2 also shows that, even if some of these recoverable reserves were not economic eventually and there is a substantial further increase in production, the indicated reserve life for the coalfields serviced by ARTC's Hunter Coal Network will be at least 30 years without any increases in reserves.

Moreover, if further recoverable reserves are proven at any reasonable rate compared to the production rate, as they have been over the last seven years for which data is available, the indicated reserve life will increase well above 30 years.

Table 2
NSW Coal Production & Reserve Life

	Raw Coal Production (Mtpa)		**Indicated Reserve Life (Years)**	
Coalfield	**1999/00**	**2006/07**	**At 30 June 1999**	**At 30 June 2006**
Hunter	NA	NA	NA	NA
Gloucester	NA	NA	NA	NA
Gunnedah	NA	NA	NA	NA
Sub-total	**86.7**	**114.5**	**58**	**59**
Newcastle	20.1	20.7	89	90
Western	14.3	21.7	88	83
Southern	11.8	13.4	74	57
Oatlands	0	0	NA	NA
Total	**132.9**	**170.3**	**76**	**73**

D.4 NSW Minerals Council comments on MJA mine data

Notes:

- Mines in **bold black** are as listed in Booz/ARTC analysis. Mine with -P suffix is classified as Proposed (not yet developed) in Booz/ARTC analysis.
- Mine name changes are indicated in **bold red**.
- Mines in **bold brown** are listed in Annual Reports or other company documentation, but are not included in the Booz/ARTC analysis.
- Mines in **bold blue** are those supplied by NSWMC, but are not included in the Booz/ARTC analysis.
- Status of mines in **bold blue** as indicated by NSWMC that differ from status shown in Booz/ARTC analysis.

Mine Name	NSWMC Comment					
	Mine Status	Loading Station (Nearest Mine name)	Export coal transport		Power Station coal	
			ARTC HVAU assets	Non-ARTC HVAU assets	Coal Supplied	Transport method
Zone 1						
Abel	**Proposed**	Bloomfield	Yes			
Ashton (O/C & U/G)	Operating	Ashton	Yes			
Austar	Operating	Austar	Yes			
Awaba East	**Proposed**	Newstan	Yes			
Awaba	**Operating**	Newstan	Yes	Non-HVAU Rail/ Road	Yes	Road
Bloomfield	Operating	Bloomfield	Yes			
Bulga (formerly Saxonvale)	Operating	Bulga	Yes			
Beltana (Part of Bulga)	**Operating**	Bulga	Yes			
Blakefield (Part of Bulga)	**Under Construction**	Bulga	Yes			
Camberwell	**Closed**	Camberwell	Yes			
Chain Valley	**Operating**	Not Applicable	**No**	Road	Yes	Road
Cumnock No 1	Operating	Ravensworth Coal Terminal	Yes			
Donaldson	Operating	Bloomfield	Yes			
Drayton	Operating	Drayton	Yes	Conveyor	Yes	Conveyor
Duralie	Operating	Duralie	Yes			
Glendell	Operating	Mt Owen	Yes			

Mine Name	NSWMC Comment					
	Mine Status	Loading Station (Nearest Mine name)	Export coal transport		Power Station coal	
			ARTC HVAU assets	Non-ARTC HVAU assets	Coal Supplied	Transport method
Integra O/C & U/G (was Glennies Creek)	Operating	Camberwell	Yes			
Grant & Chainey	Not known to NSWMC	Not known to NSWMC				
Hunter Valley Operations	Operating	Hunter Valley/ Mt Thorley 2	Yes		Yes	Conveyor
Hunter Valley South	Proposed	Hunter Valley/ Mt Thorley 2	Yes			
Liddell	Operating	Lidell	Yes			
Mandalong	Operating	Newstan	**No**	Non-HVAU Rail/ Conveyor	Yes	Conveyor
Mannering	Operating	Not Applicable	**No**	Conveyor	Yes	Conveyor
Mitchells Flat	Proposed	Not Yet Decided	Yes			
Mount Arthur	Operating	Mt Arthur	Yes	Conveyor	Yes	Conveyor
Mt Arthur Southern Pit	Proposed	Mt Arthur	Yes			
Mt Arthur U/G	Proposed	Mt Arthur	Yes			
Mt Thorley	Operating	Mt Thorley	Yes			
Mt Thorley U/G	Proposed	Mt Thorley	Yes			
Mt Owen	Operating	Mt Owen	Yes	Conveyor	Yes	Conveyor
Muswellbrook	Operating	Ravensworth Coal Terminal	Yes	Conveyor/ Road	Yes	Conveyor/ Road
Myuna	Operating	Newstan	Yes	Non-HVAU Rail/ Conveyor	Yes	Conveyor
Ravensworth UG (was Newpac no 1)	Operating	Ravensworth Coal Terminal	Yes			
Newstan	Operating	Newstan	Yes	Non-HVAU Rail/ Road	Yes	Road
Ravensworth East (Mt Owen)	See Mt Owen					
Ravensworth West & Narama	Operating	Not Applicable	**No**	Conveyor	Yes	Conveyor
Rixs Creek	Operating	Rix's Creek	Yes			

Mine Name	NSWMC Comment					
	Mine Status	Loading Station (Nearest Mine name)	Export coal transport		Power Station coal	
			ARTC HVAU assets	Non-ARTC HVAU assets	Coal Supplied	Transport method
Saddlers Creek (O/C & U/G) (to be Drayton South)	Proposed	Drayton	Yes			
Sandy Creek	Proposed	Ravensworth Coal Terminal	Yes			
Stratford	Operating	Stratford	Yes			
Tasman	Operating	Tasman	Yes	Non-HVAU Rail		
Teralba	Closed					
United	Operating	Mt Thorley 2	Yes		Yes	ARTC Rail
Wallarah No. 2	Proposed	Not known to NSWMC	**No**			
Wambo (O/C & U/G)	Operating	Wambo	Yes			
Warkworth	Operating	Mt Thorley 1	Yes			
Westside	Operating	Not Applicable	**No**	Private Road	Yes	Private Road
West Wallsend	Operating	Not Applicable	**No**	Road	Yes	Road
Zone 2						
Bengalla	Operating	Bengalla	Yes		Yes	ARTC Rail
Bengalla (Wantana)	Proposed	Bengalla	Yes			
Bylong	Proposed	Bylong	Yes			
Mangoola (was Anvil Hill)	Proposed	Mangoola	Yes			
Moolarben (O/C & U/G)	Under Construction	Moolarben	Yes			
Mount Pleasant	Proposed	Bengalla	Yes			
Ulan (O/C & U/G)	Operating	Ulan	Yes		Yes	ARTC Rail
Ulan West U/G	Proposed	Ulan	Yes			
Wilpingjong	Operating	Wilpingjong	Yes		Yes	ARTC Rail
Zone 3						
RocGlen (Belmont)	Operating	Gunnedah	Yes			
Bickham	Proposed	Bickham	Yes			
Blue Vale	Not known to NSWMC	Not known to NSWMC	Yes			
Boggabri	Operating	Boggabri	Yes			

Mine Name	NSWMC Comment					
	Mine Status	Loading Station (Nearest Mine name)	Export coal transport		Power Station coal	
			ARTC HVAU assets	Non-ARTC HVAU assets	Coal Supplied	Transport method
Caroona - P	Proposed	Caroona - P	Yes			
Dartbrook (O/C Planned)	**Temporarily Closed**	Dartbrook	Yes			
Maules Creek - P	Proposed	Maules Creek	Yes			
Narrabri (North & South)	**Proposed**	Narrabri	Yes			
Sunnyside	**Proposed**	Gunnedah	Yes			
Tarrawonga	Operating	Gunnedah	Yes			
Watermark - P	Proposed	Watermark	Yes			
Werris Creek	Operating	Werris Creek	Yes			
Canyon (was Whitehaven)	Operating	Canyon	Yes			